SPECIAL ARTICLE

New Drivers of Growth? Sectoral Contributions to the Irish Economy

by

Eoin O'Malley and Yvonne McCarthy

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1. Introduction

The purpose of this article is to analyse the contributions of different sectors to the economy and to examine how those contributions have changed over time. There are two main reasons why it is of interest to examine this issue at present. First, there is a common perception that the growth of Manufacturing, which used to be very important, may now have run out of steam, with most economic growth in recent years seen to come from Services and Construction (e.g. Fitz Gerald *et al.*, 2005). A shift from Manufacturing towards Services would not in itself be unusual for an advanced industrial economy (Schettkat and Yocarini, 2003), but the trends seen in Ireland have given rise to some concerns about the sustainability of the pattern observed (e.g. O'Leary, 2005; Keenan, 2005). In particular, it is often suggested that weakness in Manufacturing implies weakness in major internationally traded activities while growth in sectors like Services and Construction may be too dependent on temporarily favourable domestic demand conditions.

Second, there are related concerns about the implications of these trends for productivity, defined as output per employee. Productivity growth in the Irish economy appears to have been low for the past year or two. Some observers have suggested that this has happened at least partly because a high-productivity sector – Manufacturing – has been in relative decline, while growth has mainly occurred in sectors with lower productivity such as Services and Construction (Central Bank and Financial Services Authority of Ireland, 2005; White, 2006).

An important factor that complicates consideration of these issues is the fact that there tends to be large outflows of profits from foreign-owned companies in Ireland, particularly from companies in the modern Manufacturing sector. This means that

the role played by Manufacturing in driving output and productivity may be over estimated and thus that of sectors with little or no profit repatriations may be under estimated, if these outflows are not taken into account (O'Malley and Roper, 2003, Chapter 2).

We aim to shed some light on these issues by providing new information and analysis showing how different sectors have contributed to the economy over time. The timeframe chosen for the analysis is 1995 to 2004, during which time the Irish economy grew at historically high rates.

The remainder of this article is structured as follows: Section 2 examines the contributions to total output of the different economic sectors and the changing patterns of these contributions over time. In this section, we estimate profit outflows by sector and assess any changes in the sectoral contributions to total output after these outflows have been taken into account. Section 3 looks at the changing contributions of different sectors to total employment, and highlights those sectors that have been most important for employment growth over the last decade. In Section 4, we compare the results of the previous two sections by examining productivity, defined as output per employee. We look first at output per employee using the output data before adjustments for profit repatriations by sector, and then compare these results to output per employee after adjustments for profit repatriations. In the penultimate section, we examine sectoral net exports, defined as exports from a sector minus the imported inputs that are required to sustain production in that sector. We argue that it could be misleading to assess the contributions of different sectors to the economy simply on the basis of their contributions to production or employment. This is because sectors that have substantial net exports make a distinctive and important contribution in helping to facilitate production and growth in other economic sectors.[1] In Section 6, we present our conclusions.

2. Production

In most countries production and economic growth at the aggregate level are usually measured in terms of Gross Domestic Product (GDP). However, it has been widely accepted for many years that Gross National Product (GNP) is a measure that is more appropriate for the Irish economy. The difference between GDP and GNP is the net international flow of factor incomes. This difference is very important in Ireland, mainly because GDP includes all the substantial profits of foreign-owned multinational enterprises (MNEs) in Ireland, whereas profit outflows from foreign MNEs (after payment of tax and interest) are not included

[1] Models of open economies typically treat the internationally traded sector(s) as driving the growth opportunities of the non-traded sector(s). Our focus on the importance of net exports is similarly based on the idea that internationally traded activities make important indirect contributions, apart from their own direct production and employment. However, an explicit analysis of the pattern of indirect linkages between sectors is beyond the scope of this article. See McCarthy (2005) for a more formal discussion of indirect linkages.

in GNP. It is largely because of this that GDP in Ireland is as much as one-fifth larger than GNP. GNP is thus generally considered to be more suitable as an indicator of the amount that is retained in Ireland accruing to Irish residents.

Consequently, in order to examine the contribution of various sectors to the economy, it would be desirable to look at their contribution to GNP. However, sectoral data on a GNP basis are not available. Instead, the data that are available by sector are for Gross Value Added (GVA). GVA includes the profits of foreign-owned MNEs, and each sector's GVA is generally similar to its contribution to GDP rather than GNP.[2] Therefore, to examine the contribution of different sectors to the economy we look first at data on GVA by sector, and then we proceed to make some adjustments to the GVA data in order to take account of profit outflows from foreign MNEs.

GVA TRENDS

Table 1 presents data on sectoral contributions to total GVA.[3] In 1995, the five sectors accounting for the largest proportion of GVA amounting to almost 65 per cent, were:

Agriculture, Forestry & Fishing;
Manufacturing;
Distribution;
Financial Intermediation;
Real Estate, Renting & Business Activity.

Over the ten year period under examination, the proportion of total output accounted for by these sectors remained at close to 65 per cent, with the highest proportion accounted for by the Manufacturing sector each year. However, Table 1 also shows that there were changes in the structure of GVA during the period. In particular, there was a substantial reduction in the share of Agriculture in GVA during the whole time frame while the Construction sector accounted for a growing share of GVA. The Manufacturing sector increased its share between 1995 and 1999 but this was followed by decreases in the following years. Some of the Market Services sectors, in particular the Real Estate, Renting and Business Activities sector,[4] and the Financial Intermediation sector, also increased their shares in recent years.

[2] The sum of GVA in all sectors, after an adjustment for product taxes and subsidies, equals GDP.

[3] A detailed breakdown of each sector and its sub-components is available in Appendix 1.

[4] The largest components of "Real Estate, Renting and Business Activities" include Computer & Related Services and "Other" Business Services such as legal, accounting, market research and advertising services, as well as tax, management, engineering and other technical consultancy.

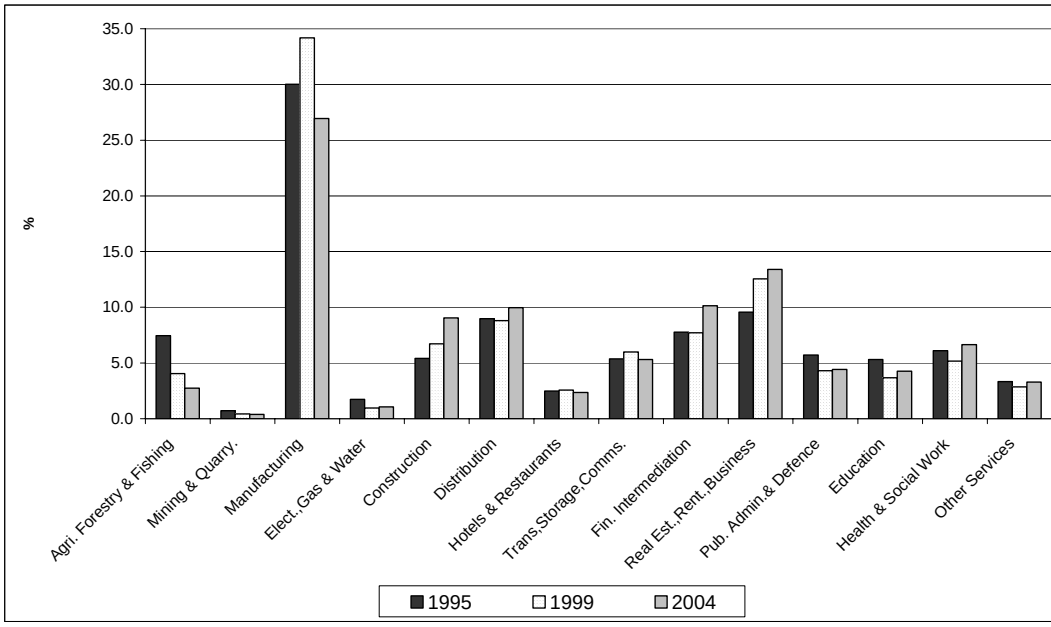
Table 1: Sectoral Proportions of Gross Value Added 1995-2004

	Percentage Contribution to Total Gross Value Added										Averages		
Sector	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**1995-2004**	**1995-1999**	**2000-2004**
Agriculture, Forestry & Fishing	7.5	6.9	5.7	4.9	4.1	3.8	3.4	3.0	2.8	2.8	4.5	5.8	3.1
Mining and Quarrying	0.7	0.6	0.8	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.6	0.4
Manufacturing	30.0	29.2	30.7	32.8	34.2	33.3	32.2	32.1	28.3	26.9	31.0	31.4	30.6
Electricity, Gas and Water	1.7	1.5	1.4	1.4	1.0	0.9	1.1	1.0	1.0	1.1	1.2	1.4	1.0
Construction	5.4	5.6	5.6	6.0	6.7	7.7	7.7	7.8	8.3	9.0	7.0	5.9	8.1
Distribution	9.0	10.1	9.7	9.0	8.8	8.9	9.0	9.5	10.4	10.0	9.4	9.3	9.6
Hotels and Restaurants	2.5	2.5	2.7	2.7	2.6	2.6	2.5	2.2	2.4	2.4	2.5	2.6	2.4
Financial Intermediation	7.8	8.1	8.2	7.9	7.7	7.6	8.1	8.5	10.1	10.1	8.4	7.9	8.9
Real Estate, Renting, Business	9.6	10.0	10.9	11.9	12.6	13.1	14.2	13.5	12.5	13.4	12.2	11.0	13.3
Public Admin. and Defence	5.7	5.5	5.1	4.6	4.3	4.2	4.1	4.1	4.3	4.4	4.6	5.0	4.2
Education	5.3	5.1	4.6	4.0	3.7	3.5	3.6	3.8	4.1	4.3	4.2	4.6	3.9
Health and Social Work	6.1	6.2	5.8	5.2	5.2	5.5	5.7	6.1	6.5	6.6	5.9	5.7	6.1
Other Services	3.3	3.1	3.1	3.0	2.9	2.7	2.5	2.8	3.3	3.3	3.0	3.1	2.9
Total GVA (€millions)	**47,220**	**52,279**	**60,310**	**70,975**	**80,490**	**92,755**	**105,167**	**117,238**	**123,583**	**130,862**	**88,088**	**62,255**	**113,921**

Source: Derived from data supplied by the CSO.

This preliminary review of the data, therefore, shows how the aggregate GVA growth statistic can obscure the changes in the underlying sectoral drivers of this growth. Between 1995 and 2004, Irish GVA increased by 117 per cent in nominal terms, but as shown in Table 1, the sources of this growth appear to have changed over time. The importance of the Services sectors increased and that of Manufacturing decreased over the last five years or so. The declining trend in the share of Agriculture and the rising trend in the share of Construction are longer established, going back at least to the mid-1990s; the Agricultural sector had been one of the five largest contributors to GVA in 1995 but the Construction sector replaced the Agricultural sector among the top five contributors from 1997 onwards. Figure 1 serves to illustrate the broad trends over time.

Figure 1: Sectoral Proportions of Gross Value Added



ADJUSTMENTS TO GVA

As already mentioned, GVA includes all the profits of foreign-owned MNEs in Ireland. Since most of these profits are taken out of the Irish economy and do not accrue as incomes to Irish residents, it would be preferable to deduct them from GVA in order to arrive at a more realistic assessment of the contribution of each sector to the Irish economy. Unfortunately, it is not possible to do that for each sector in each year. However, it is possible to make reasonable estimates for a few recent years, the latest being

Table 2: GVA Adjusted to Remove Profit Outflows and Imputed Rent, 2003

Sector	GVA 2003 € Million	GVA 2003 Proportion of Total	Estimated Profits of Foreign Companies	Allocation of Profit Outflow	Imputed Rent	Adjusted GVA	Adjusted GVA Proportion of Total
Agriculture Forestry and Fishing	3,501	2.8	-	-	-	3,501	3.9
Mining and Quarrying	488	0.4	-	-	-	488	0.5
Manufacturing	34,978	28.3	24,030	23,076	-	11,902	13.3
Electricity, Gas and Water	1,292	1.0	-	-	-	1,292	1.4
Construction	10,250	8.3	-	-	-	10,250	11.4
Distribution	12,910	10.4	669	642	-	12,268	13.7
Hotels and Restaurants	2,991	2.4	157	151	-	2,841	3.2
Transport, Storage, Communications	6,761	5.5	1,243	1,194	-	5,567	6.2
Financial Intermediation	12,537	10.1	2,360	2,266		10,271	11.5
Real Estate, Renting, Business Activities	15,397	12.5	1877	1,803	4,824	8,770	9.8
Public Administration and Defence	5,296	4.3	-	-	-	5,296	5.9
Education	5,087	4.1	-	-	-	5,087	5.7
Health and Social Work	8,058	6.5	-	-	-	8,058	9.0
Other Services	4,037	3.3	-	-	-	4,037	4.5
Total	**123,583**	**100.0**	**30,337**	**29,132**	**4,824**	**89,627**	**100.0**

Source: See Appendix 2.

2003, of profit outflows from those sectors in which they are of some real significance. Table 2 shows "Adjusted GVA" in 2003, in which estimates of profit outflows from the main sectors concerned are deducted from GVA. The methodology used in constructing this table is given in Appendix 2.

The first two columns of Table 2 show GVA by sector, and each sector's percentage of total GVA, as in Table 1. The third column shows estimates of profits of foreign-owned MNEs in a number of sectors. There are no such estimates for some sectors due to a lack of data, but there are good reasons to believe that profit outflows from foreign MNEs would not be very important in those sectors. (See Appendix 2 for further details).[5] The fourth column of Table 2 presents estimates of profit outflows from foreign companies. Thus, the difference between the third and fourth columns in the table is that the third column estimates profits of foreign companies whereas the fourth column estimates outflows of those profits.

The fifth column of Table 2 makes one further adjustment that only applies to the Real Estate, Renting & Business Activities sector. In the National Accounts, the GVA of that sector includes a substantial amount of "imputed rent" that is attributed to the owners of owner-occupied dwellings. Since this imputed rent is not really the output of a particular sector in the usual sense, we deduct this amount from the GVA of the sector where it is included, in attempting to arrive at a more realistic assessment of the contribution made by different sectors to the Irish economy. The final two columns of Table 2 show "Adjusted GVA" by sector, and the sectoral proportions of the total, after deducting profit outflows and imputed rent.

Compared to the original GVA figures in the first two columns, the post adjustment results show that the greatest change is the reduction in the Manufacturing sector's contribution to total GVA from 28.3 per cent, in unadjusted terms, to 13.3 per cent, after adjustment for profit outflows. These outflows arise primarily in the "modern" or "high-tech" sectors. There is also a substantial reduction in the Real Estate, Renting & Business Activities sector, from 12.5 per cent of GVA to 9.8 per cent of Adjusted GVA. This arises partly from the deduction of imputed rent, but also from the deduction of significant profit outflows that come mainly from Computer and Related Services and to a lesser extent from Other Business Services.

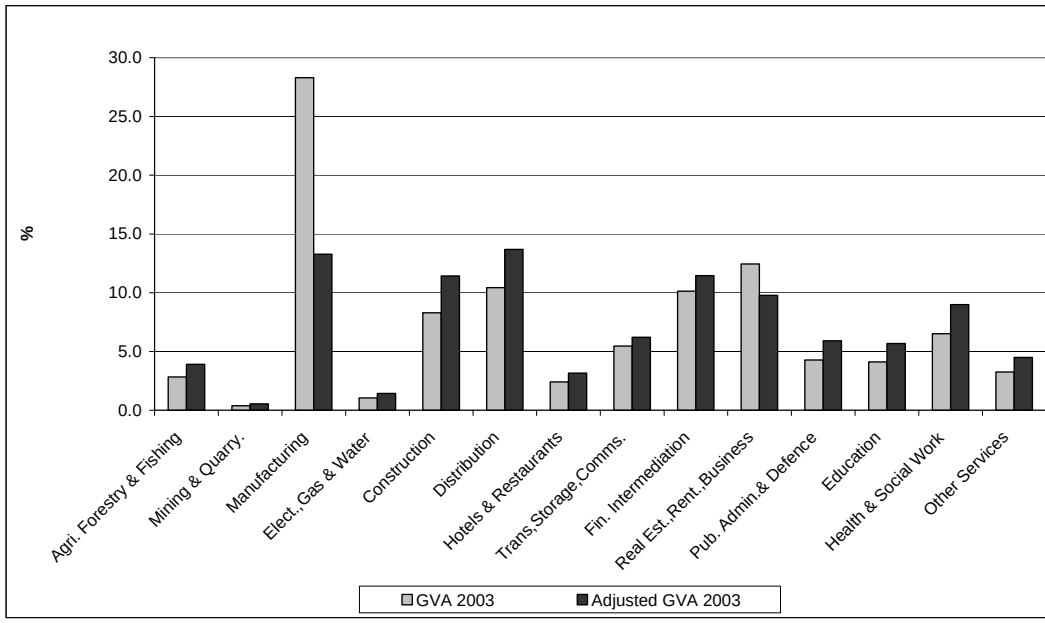
In contrast, for every other sector in Table 2 there is some increase in the share of Adjusted GVA compared to the share of Unadjusted GVA. This is true even for the sectors that had appreciable profit outflows such as Transport, Storage & Communication, and Financial Intermediation. This outcome is as a result of the very large reduction in the Manufacturing sector in particular. Naturally, however, the sectors that have the greatest

[5] It should be noted that, as explained in Appendix 2, the estimate of profits of foreign MNEs in the Financial Intermediation sector would probably be less reliable than the estimates presented for other sectors.

increase in share of Adjusted GVA compared to share of Unadjusted GVA are those that had little or no profit outflows. In Construction, for example, the share of Adjusted GVA is 11.4 per cent compared to 8.3 per cent of Unadjusted GVA.

Figure 2 illustrates the difference between the Adjusted and Unadjusted GVA by sector in 2003.

Figure 2: Sectoral Proportions of Gross Value Added (Adjusted and Unadjusted) 2003



Unfortunately, it is not possible to examine trends in this Adjusted GVA measure over a long period of time, because the *Annual Services Inquiry*, one of the main sources used to undertake the adjustments, did not include the necessary data to estimate profits of foreign-owned firms before 2001, while the *Census of Industrial Production (CIP)* did not include the necessary data before 1997.[6] However, we can make a few relevant observations about trends in Manufacturing over the period 1997 – 2001, based on the CIP data. Following that, we can then move on to examine trends in our Adjusted GVA measure in the subsequent period 2001-2003.

First, as foreign-owned MNEs in the modern or high-tech Manufacturing sectors were growing particularly rapidly in the second half of the 1990s, the profits of foreign companies were accounting for an increasing share of GVA in Manufacturing at that time. Consequently, profit outflows were probably taking a rising proportion of Manufacturing GVA in the second half of the 1990s. Therefore, although Manufacturing was increasing its share of total GVA at the time, this probably would not have been the case if profit outflows were deducted. To illustrate this, Manufacturing increased its share of total GVA from 30.7 per cent in 1997 to a

[6] The data needed from the CIP are data by nationality of ownership from the Census of Industrial Enterprises, rather than the Census of Industrial Local Units.

peak of 34.2 per cent in 1999 as shown in Table 1, which was a rise of 3.5 percentage points of total GVA. However, our estimated profits of foreign companies in Manufacturing amounted to 16.1 per cent of total GVA in 1997 increasing to 20.0 per cent in 1999, which was a rise of 3.9 percentage points of total GVA. Therefore, the growth in profits of foreign companies in Manufacturing was more than sufficient to account for Manufacturing's rising share of total GVA. This makes it unlikely that Manufacturing could have had a significant increase in its share of "Adjusted GVA" in the late 1990s.

In the years after 1999, Manufacturing's share of total GVA declined considerably as seen in Table 1. In particular, there were setbacks in Electrical & Optical Equipment and, after 2002, in Chemicals, though other branches of Manufacturing continued growing. Since the majority of profits of foreign MNEs in Manufacturing originate in the Electrical & Optical Equipment and Chemicals sectors, it could be expected that profit outflows would eventually have declined in importance in Manufacturing. If so, the decrease in Manufacturing's share of Adjusted GVA would have been less marked than the decline in its share of total GVA. To illustrate this, in the period 1999-2001, Manufacturing's share of total GVA declined from 34.2 per cent to 32.2 per cent, which was a reduction of 2.0 percentage points of total GVA. However, our estimated profits of foreign companies in Manufacturing amounted to 20.0 per cent of total GVA in 1999 decreasing to 19.3 per cent in 2001, which was a reduction of 0.7 percentage points of total GVA. Therefore, there was probably a reduction in Manufacturing profit outflows as a percentage of total GVA, which would have made the decline in Manufacturing's share of Adjusted GVA slower than the decline in its share of total GVA.

Turning next to the period 2001-2003, as shown in Table 3, the share of Manufacturing in total GVA declined by 3.9 percentage points in 2001-2003. Meanwhile, its share of Adjusted GVA declined by a smaller figure of 2.3 percentage points. At the same time, Transport, Storage & Communications and Real Estate, Renting & Business Activities are two service sectors where the trends in share of Adjusted GVA were noticeably weaker than the trends in share of GVA. This was a result of rising profit outflows from those sectors, as well as rising imputed rent. In other sectors, the changes in share of GVA were similar to the changes in share of Adjusted GVA.

Table 3: Change in Shares of GVA and Adjusted GVA, 2001-2003

Sector	Unadjusted GVA 2003 Proportion of Total	Unadjusted GVA 2001 Proportion of Total	Difference 2003-2001	Adjusted GVA 2003 Proportion of Total	Adjusted GVA 2001 Proportion of Total	Difference 2003-2001
Agriculture Forestry and Fishing	2.8	3.4	-0.6	3.9	4.8	-0.9
Mining and Quarrying	0.4	0.5	-0.1	0.5	0.7	-0.1
Manufacturing	28.3	32.2	-3.9	13.3	15.6	-2.3
Electricity, Gas and Water	1.0	1.1	-0.1	1.4	1.6	-0.2
Construction	8.3	7.7	0.6	11.4	10.7	0.8
Distribution	10.4	9.0	1.4	13.7	12.2	1.5
Hotels and Restaurants	2.4	2.5	-0.1	3.2	3.4	0.2
Transport, Storage, Communications	5.5	5.3	0.1	6.2	7.2	-0.9
Financial Intermediation	10.1	8.1	2.0	11.5	9.4	2.0
Real Estate, Renting, Business Activities	12.5	14.2	-1.8	9.8	12.4	-2.6
Public Administration and Defence	4.3	4.1	0.1	5.9	5.8	0.2
Education	4.1	3.6	0.5	5.7	5.0	0.7
Health and Social Work	6.5	5.7	0.9	9.0	7.9	1.1
Other Services	3.3	2.5	0.8	4.5	3.5	1.0
Total	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**

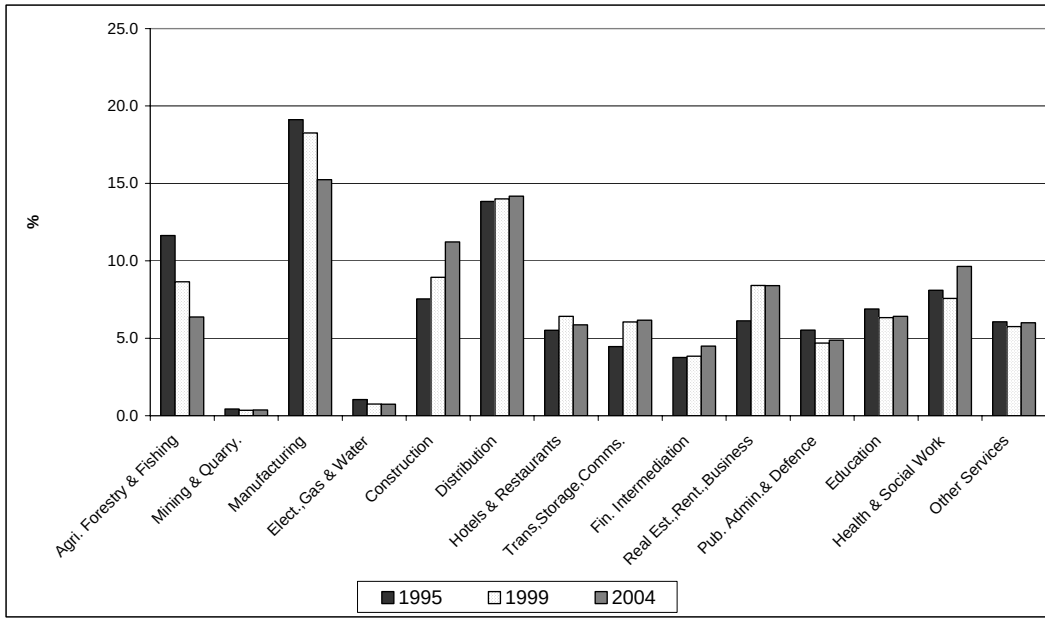
Source: Table 1 and Appendix 2.

3. Employment

Turning to employment trends, Table 4 and Figure 3 show that there have been changes in the structure of employment over the period 1995 to 2004. In particular, there was a marked reduction in the share of Agriculture in total employment, and less significant reductions in the share of Manufacturing, Public Administration & Defence, and Education. Agriculture experienced almost a halving of its contribution to total employment over the period; in 1995, 11.6 per cent of total employment was in Agriculture while in 2004 this figure had dropped to 6.4 per cent. Changes in the share of Manufacturing in total employment were more moderate than the changes seen in its share of GVA. Thus, its share of employment changed little in the late 1990s and then declined by only 2.1 percentage points in 2001–2004 while its share of GVA declined by 5.3 percentage points.

On the other hand, there was quite a substantial rise in the share of employment in Construction and Real Estate, Renting & Business Activities, with smaller increases in the share of some other Service sectors. Construction sector employment increased from 7.5 per cent of the total in 1995 to 11.2 per cent in 2004, while employment in Real Estate, Renting & Business Activities increased from 6.1 per cent of the total to 8.4 per cent.

Figure 3: Sectoral Proportions of Employment



Examining the proportion of total employment accounted for by each sector in each year is useful in highlighting the importance of the different sectors for the economy in terms of the level of employment. However, as a key aim of policy makers tends to be employment creation, it is useful to examine the contribution to growth, as measured by the percentage change in total employment between two time periods, accounted for by each

Table 4: Sectoral Proportions of Employment 1995-2004[7]

Sector	Percentage Contribution to Total Employment										Averages		
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	1995-2004	1995-1999	2000-2004
Agriculture, Forestry and Fishing	11.6	10.6	10.3	9.1	8.6	8.0	7.1	7.0	6.5	6.4	8.5	10.1	7.0
Mining and Quarrying	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4
Manufacturing	19.1	18.6	17.6	19.1	18.3	17.4	17.3	16.1	16.0	15.2	17.5	18.5	16.4
Electricity, Gas and Water	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.9	0.7
Construction	7.5	7.6	8.0	8.4	8.9	9.9	10.5	10.3	10.7	11.2	9.3	8.1	10.5
Distribution	13.8	13.9	14.0	14.1	14.0	14.1	14.4	14.0	14.0	14.2	14.0	14.0	14.1
Hotels and Restaurants	5.5	5.5	5.5	6.6	6.4	6.5	6.0	5.9	6.4	5.9	6.0	5.9	6.1
Transport, Storage, Communications	4.5	4.6	4.7	5.8	6.1	6.1	6.4	6.3	6.3	6.2	5.7	5.1	6.3
Financial Intermediation	3.8	3.8	3.7	3.7	3.8	4.1	4.0	4.0	4.1	4.5	3.9	3.8	4.1
Real Estate, Renting, Business Activities	6.1	6.3	6.1	7.8	8.4	8.5	8.6	9.0	8.6	8.4	7.8	7.0	8.6
Public Administration and Defence	5.5	5.7	5.2	4.7	4.7	4.7	4.7	5.1	5.2	4.9	5.0	5.2	4.9
Education	6.9	7.3	6.8	6.2	6.3	6.2	6.0	6.3	6.5	6.4	6.5	6.7	6.3
Health and Social Work	8.1	8.5	8.7	7.6	7.6	8.0	8.4	9.0	9.5	9.6	8.5	8.1	8.9
Other Services	6.1	6.0	8.1	5.6	5.8	5.6	5.4	5.7	5.3	6.0	6.0	6.3	5.6
Total Employment (000s)	**1,282**	**1,328**	**1,380**	**1,493**	**1,589**	**1,672**	**1,722**	**1,764**	**1,79**	**1,836**	**1,586**	**1,414**	**1,757**

Source: Derived from unpublished data from the CSO.

[7]Annual employment levels for 1998-2004 taken as the second quarter results from the *Quarterly National Household Survey*.

sector. Table 5 shows the total employment change (in levels and percentage terms) between 1995 and 1999 and also between 1999 and 2004.

Table 5: Change in Employment Between 1995 and 1999, 1999 and 2004

Sector	1995 to1999		1999 to 2004	
	000s	%	000s	%
Agriculture Forestry and Fishing	-11.8	(-7.91)	-20.3	(-14.79)
Mining and Quarrying	0.1	(1.82)	1.3	(0.95)
Manufacturing	45.1	(18.41)	-10.2	(-7.43)
Electricity, Gas and Water	-1.3	(-9.77)	1.6	(1.17)
Construction	45.5	(47.10)	63.9	(46.54)
Distribution	45.2	(25.49)	37.7	(27.46)
Hotels and Restaurants	31.4	(44.48)	5.8	(4.22)
Transport, Storage, Communications	39.0	(68.18)	17.0	(12.38)
Financial Intermediation	12.9	(26.82)	21.6	(15.73)
Real Estate, Renting, Business Activities	55.3	(70.54)	20.6	(15.00)
Public Administration and Defence	3.7	(5.23)	15.0	(10.92)
Education	12.3	(13.93)	17.3	(12.60)
Health and Social Work	16.5	(15.90)	56.7	(14.30)
Other Services	13.6	(17.48)	18.7	(20.46)
Total Employment (000)	**307.5**	**(23.99)**	**246.7**	**(15.52)**

Note: Values in parenthesis refer to percentage change in each sector's employment between 1995 and 1999 (in column 2) and between 1999 and 2004 (in column 3).

As shown in the table, between 1995 and 1999, total employment rose by over 307,000, an increase of about 24 per cent on the 1995 level. The largest proportion of this increase was accounted for by the Real Estate, Renting & Business Activities sector (whose employment rose by over 70 per cent between 1995 and 1999), with Construction, Distribution and Manufacturing also accounting for significant increases. Between 1999 and 2004, the level of total employment rose by 247,000, or 15.5 per cent. During this period the Construction and Health sectors were the most significant contributors. Manufacturing and Agriculture saw declines in employment levels over the period.

The results in Table 5 therefore corroborate the results of Table 4, highlighting the significant contribution of Construction and Services to total employment between 1995 and 2004. A noticeable result of Table 5 is the fact that apart from Agriculture, Manufacturing was the only other sector to make a negative contribution to employment growth between 1999 and 2004, although the actual decline in Manufacturing was not very large.

4. Labour Productivity

Comparing Table 4 and Table 1, it is noticeable that some sectors' share of employment is quite different to their share of GVA. Analysing these statistics further, Table 6 presents data for GVA per employee. The results show that productivity (defined here as output per employee) is much higher than average in the Financial Intermediation sector. GVA per employee in that sector was higher

Table 6: GVA Per Employee by Sector, €000

Sector	Productivity Levels – GVA per Employee (000s)									
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Agriculture Forestry and Fishing	23.6	25.4	24.3	25.7	23.7	26.4	29.4	27.9	30.0	30.8
Mining and Quarrying	61.8	68.6	79.3	75.7	62.0	71.4	70.1	55.6	72.8	71.8
Manufacturing	57.9	61.6	76.2	81.5	94.8	105.9	113.3	132.2	122.0	126.0
Electricity, Gas and Water	61.6	56.1	70.2	79.6	64.1	74.2	100.6	95.4	101.7	103.4
Construction	26.4	28.8	30.4	34.0	38.1	43.1	44.8	50.0	53.6	57.5
Distribution	23.9	28.7	30.2	30.2	31.8	35.1	38.4	45.2	51.3	50.1
Hotels and Restaurants	16.7	18.0	21.3	19.3	20.3	22.5	25.1	25.1	26.1	28.6
Transport, Storage, Communications	44.4	47.9	53.4	50.1	50.2	52.4	50.4	54.7	60.3	61.4
Financial Intermediation	76.4	83.2	98.2	102.0	101.8	102.3	124.6	141.4	171.0	160.8
Real Estate, Renting, Business Activities	57.6	62.5	77.6	72.8	75.6	85.5	100.7	99.9	100.0	113.6
Public Administration and Defence	38.1	37.7	42.5	45.9	46.6	49.4	53.5	53.5	57.3	64.8
Education	28.4	27.4	29.9	30.7	29.5	31.8	36.5	40.2	43.8	47.3
Health and Social Work	27.8	28.7	29.3	32.2	34.6	38.0	41.4	44.9	47.4	49.1
Other Services	20.2	20.4	16.7	25.7	25.2	27.1	28.6	32.7	42.1	39.1
Total Services	*33.4*	*35.9*	*38.8*	*41.6*	*43.1*	*46.9*	*52.6*	*56.8*	*62.0*	*64.5*
Total	**36.8**	**39.4**	**43.7**	**47.5**	**50.6**	**55.5**	**61.1**	**66.5**	**68.9**	**71.3**

Source: Derived from data in Tables 1 and 4.

than for any other sector in the economy over the timeframe. Productivity levels are also high in Manufacturing, Real Estate, Renting & Business Activities, and Electricity. On the other hand, Construction, Agriculture and all the other Services sectors have relatively low productivity. This view is correct if we are thinking of productivity in terms of GVA per employee, which is similar to the contribution to GDP per employee.[8]

However, if we want to know about productivity in terms of the contribution to *GNP* per employee, the Adjusted GVA figures from Table 2 are much more informative. The results, given in Table 7, show that productivity in the Financial Intermediation sector continues to outperform any of the other sectors with output per employee in that sector being more than double the average for the whole economy in 2003. On the other hand, productivity in the Manufacturing sector, which boasted the second highest productivity level before adjustments to GVA, is much lower and more in line with the average for the economy. The same applies to the Real Estate, Renting & Business Activities sector. Thus, on the basis of this Adjusted GVA measure, the contribution to GNP per employee in Manufacturing and in Real Estate, Renting & Business Activities is not greatly different from the average level for all sectors, whereas it is much higher than the average level in Financial Intermediation. On the same basis, it can be concluded that the contribution to GNP per employee in Construction, and in most of the other services sectors, is about the same as the average level for all sectors.

These findings imply that a decline in the share of Manufacturing in GDP and a rise in the share of Construction and most Services would tend to reduce average productivity as measured by GDP per employee. However, when productivity is measured in terms of the contribution to GNP per employee, Manufacturing, Construction and Services as a whole all have productivity levels that are not greatly different to the average level. Consequently, a decline in the relative size of Manufacturing combined with a rise in Construction and Services would not have substantial adverse implications for overall productivity levels.

[8] A shift share analysis could be carried out at this point in order to get an idea of how aggregate productivity levels in the economy have been driven by changing productivity within sectors or by shifts of output and employment among sectors with different productivity levels. The authors undertook this analysis and found that almost all of the productivity change observed each year between 1995 and 2004 was due to "intra-sectoral effects", i.e. productivity changes within sectors rather than by shifts of output and employment among sectors.

Table 7: Adjusted GVA Per Employee by Sector (€000s), 2003

Sector	2003
Agriculture, Forestry and Fishing	30.0
Mining & Quarrying	72.8
Manufacturing	41.5
Electricity, Gas & Water	101.7
Construction	53.6
Distribution	48.8
Hotels & Restaurants	24.8
Transport, Storage, Communications	49.7
Financial Intermediation (after AFS)	140.1
Real Estate, Renting, Business Activities	57.0
Public Administration and Defence	57.3
Education	43.8
Health & Social Work	47.4
Other Services	42.1
Total Services	*52.7*
Total	**50.0**

Source: Derived from Tables 2 and 4.

5. Net Exports

In examining the contribution of different sectors to the economy, it is important to consider their *net exports*. By *net exports* of a sector we mean exports from that sector minus the imported inputs that are required to sustain production in the sector.[9] Sectors that have substantial *net exports* make a distinctive and important contribution that helps to facilitate production and growth in the other sectors.

The reason why this is so arises from the fact that nearly all sectors import significant amounts of inputs (although sectors do vary in import-intensity), while consumers also spend a large part of their incomes on imports. These imports usually tend to grow as the economy grows. However, consumers do not produce any exports to pay for their imports and some sectors do not export enough to pay for their own imported inputs. It is necessary, therefore, for the remaining sectors to export sufficient amounts to pay not only for their own imported inputs but also for many other imports into the economy.[10] The *net exports* of these sectors, or the surplus of their exports over their own imports, are therefore valuable for sustaining growth in the rest of the economy. Thus,

[9] Note that this is not the same thing as exports from a sector minus imports of the same category of products that are produced by the sector.

[10] If total exports are not sufficient to pay for total imports, this could constrain growth in the internationally traded activities in the economy. As firms engaging in the internationally traded sector purchase goods and services from domestic industries that produce non-traded goods and services, this could also lead to constrained growth in these domestically dependant industries.

sectors with negative *net exports* may look vibrant in terms of strong trends in production or employment, but their continuing prosperity usually depends to a significant degree on the success of *net exporting* sectors.[11]

In order to examine *net exports* by sector, we use the input-output tables that are produced by the CSO.[12] Since these tables are produced at infrequent intervals we can only produce three 'snapshots' showing the *net exports* position in 1990, 1998 and 2000. The results are presented in Table 8 below.

The total value of *net exports* for all sectors increased substantially between 1990 and 2000, from €6.9 billion to €31.5 billion. As regards the contribution of sectors, Manufacturing stands out as having by far the largest *net exports*, amounting to 99 per cent of the total in 2000. Its share of the total had increased from 99.5 per cent in 1990 to 118.3 per cent in 1998 before dropping back to 99 per cent in 2000. Only three other sectors had positive *net exports* in 2000, namely Hotels & Restaurants, Financial Intermediation, and Real Estate, Renting & Business Activities. These sectors had improved their *net export* position considerably since 1990, indicating that the internationally traded services were growing stronger within these sectors.

To make a more realistic assessment of *net exports* by sector, it would be desirable to subtract foreign MNEs' profit outflows from the net exports figures in Table 8. Unfortunately, it is not possible to estimate profits of foreign MNEs in any sector apart from Manufacturing in the years concerned. In 2000, profits of foreign MNEs in Manufacturing were about €22.4 billion, after capital expenditure. If we assume that all of those profits were taken out of the country and subtract that amount from Manufacturing *net exports* in Table 8, the *net exports* of Manufacturing in 2000 would be reduced to about €8.8 billion, and total *net exports* would be reduced to €9.1 billion. In that case, despite the large profit outflows, Manufacturing would still have been the dominant contributor to net exports with 97 per cent of the total. Of course, if the profit outflows coming from other sectors could also be deducted from their *net exports*, the share of Manufacturing in *net exports* would have been larger than 97 per cent.

[11] There are some circumstances in which this statement does not hold true, but they tend to be temporary in nature. For example, growth of imports could be financed for a time by growing debt rather than exports. Alternatively, the need to sustain growing imports could be reduced for a time if the pattern of domestic demand is shifting away from purchasing internationally traded goods towards non-traded products such as housing. However, unless there is reason to believe that this situation will continue, it will ultimately be necessary to have a sound export performance.

[12] Input-output tables give a detailed picture of the inter-sectoral transactions of all goods and services in the Irish economy in a single year. Thus they show the amount of home-produced inputs from each sector as well as the amount of imported inputs that were needed to produce the output that came from each sector.

Table 8: Net Exports By Sector

Sector	Net Exports 1990		Net Exports 1998		Net Exports 2000	
	€ Million	% of Total	€ Million	% of Total	€ Million	% of Total
Agriculture, Forestry and Fishing	135	1.9	-929	-4.1	-179	-0.6
Mining & Quarrying	-99	-1.4	-50	-0.2	-65	-0.2
Manufacturing	6,905	99.5	26,648	118.3	31,208	99.0
Electricity, Gas & Water	-111	-1.6	-707	-3.1	-562	-1.8
Construction	-898	-12.9	-2,499	-11.1	-2,965	-9.4
Distribution	223	3.2	-1,171	-5.2	-1,121	-3.6
Hotels & Restaurants	222	3.2	281	1.2	1,161	3.7
Transport, Storage, Communications	490	7.1	-690	-3.1	-6	0.0
Financial Intermediation	7	0.1	1,224	5.4	1,265	4.0
Real Estate, Renting, Business Activities	212	3.1	1,448	6.4	4,255	13.5
Public Administration & Defence	-40	-0.6	-225	-1.0	-341	-1.1
Education	0	0.0	-174	-0.8	-137	-0.4
Health & Social Work	-56	-0.8	-498	-2.2	-939	-3.0
Other Services	-48	-0.7	-140	-0.6	-38	-0.1
Total	**6,942**	**100.0**	**22,521**	**100.0**	**31,536**	**100.0**

Note: Net exports here means exports from a sector minus the imported inputs that are required to sustain production in the sector.

RECENT EXPORT TRENDS

Although we cannot update the measurement of *net exports* without a more recent input-output table, we can at least give an indication of export trends in more recent years.

In 2000, according to the *Balance of International Payments*, "merchandise" accounted for 81.3 per cent of total exports while services accounted for the remaining 18.7 per cent.[13] In the period 2000-2005, however, merchandise exports increased by less than 1 per cent per year (in nominal values) while the value of services exports increased by 20 per cent per year. Consequently, the share of merchandise in total exports declined to 64.5 per cent by 2005 while the share of services rose to 35.5 per cent.

To some extent, however, this change was not quite as remarkable as it seems. This qualification relates to exports of "computer services", which is the largest category of services exports. Computer services accounted for 11.6 per cent of *total* exports in 2005, having increased from 6.1 per cent in 2000. It seems that part of this increase, and a corresponding part of the decline in merchandise's share of total exports, would simply reflect a change in the method of delivering software to customers. If software is sold on a physical medium such as a disk (or if it is pre-installed on a new computer), it is counted as a merchandise export. But if it is transmitted separately to the customer by electronic means, it is counted as a computer service export. Presumably, the

[13] In the period considered here, industrial products accounted for 90-95 per cent of "merchandise" exports, with the remainder being unprocessed primary products.

latter means of delivery has become increasingly common during the period since 2000.

Having said that, however, there is no doubt that there was a substantial genuine increase in the share of services in total exports. According to the *Balance of International Payments* the major categories of services exports in 2005 were: Computer Services (11.6 per cent of total exports, up from 6.1 per cent in 2000); Business Services (9.3 per cent of total exports, up from 3.3 per cent in 2000); Insurance (5.2 per cent of total exports, up from 1.2 per cent in 2000); and Financial Services (3.6 per cent of total exports, up from 2.3 per cent in 2000). The first two of these categories would largely come from the production sector "Real Estate, Renting and Business Activities" while the other two would mainly come from the production sector "Financial Intermediation". It seems clear, therefore, that the trend seen in Table 8 concerning these two production sectors must have continued, and they have made a strongly increasing positive contribution to net exports.

However, there is not necessarily a very clear and simple correspondence between trends in exports and trends in *net exports* for a number of reasons. For one thing, it is possible that the slowdown in Manufacturing exports has occurred mainly in branches that have a relatively high import content or relatively high profit outflows. If so, the trend in Manufacturing *net exports* in 2000-2005 could have been somewhat stronger than the trend in Manufacturing exports. Another point is that exports of services generally have a lower import content than Manufacturing exports, as discussed in Fitz Gerald *et al.* (2005, Chapter 2).[14] Other things being equal, this means that as services increase their share of exports, *net exports* rise faster than exports. On the other hand, some of the service sectors with rapid export growth have higher profit outflows from foreign companies than most service sectors would have. Thus, there are a number of considerations here that complicate the relationship between export trends and *net export* trends.

Nevertheless, in view of the high rate of growth in the relevant services exports seen in 2000-2005, it must be safe to say that that the services sectors "Real Estate, Renting and Business Activities" and "Financial Intermediation" have made an increasing positive contribution to *net exports*. This has been an important development at a time when Manufacturing exports were slowing down.

While exports of some services have become considerably more significant in recent years, it is worth noting that Manufacturing remains very important as a contributor to both exports and *net exports*. It should be borne in mind that, in 2000 when the share of merchandise in total exports was 81 per cent, Manufacturing accounted for about 99 per cent of total "net exports". Therefore, in 2005 when the share of merchandise in total exports was down

[14] Note that although it is true that exports of services have a lower import content than Manufacturing exports, Manufacturing still makes a much larger contribution than services to "net exports" as we have discussed it, because Manufacturing exports most of its output, unlike services.

to 65 per cent, Manufacturing's share of net exports was probably still much higher than that.[15] As a very rough estimate, Manufacturing's share of net exports was probably in the region of 80-90 per cent in 2005.

6. Conclusions

Over the past decade there have been some very noticeable changes in the contributions made by different sectors to the Irish economy and to economic growth. At the same time, some of the changes are rather less profound than they might appear at first sight.

The changes look most dramatic when presented in terms of sectoral shares of GVA, which is similar to a sector's contribution to GDP. While Agriculture's share of GDP declined continuously over the past decade, Manufacturing's share was increasing substantially in the late 1990s but then declined sharply after 1999. To balance these trends, there were increasing shares of GDP for Construction and for some Services such as Financial Intermediation and Real Estate, Renting & Business Activities.

When we take account of profit outflows from foreign MNEs so as to assess sectoral contributions to GNP, the trends look less dramatic in some respects. In particular, Manufacturing looks much smaller than it does in terms of share of GDP, its share of the economy was scarcely increasing at all in the late 1990s, and the decline in its share after 1999 was probably less marked than it seems in terms of GDP.

Trends in employment also tend to reflect this impression of more moderate change. The share of Manufacturing in total employment changed little in the late 1990s and then declined after that, but by less than the decline in its share of GDP. Meanwhile, there were increasing shares of total employment for Construction and for services such as Financial Intermediation and Real Estate, Renting & Business Activities.

There seems to be quite a widespread impression that particularly strong Manufacturing growth used to be the major component of overall economic growth up to about 2000, but that process has now run out of steam and has been replaced by new trends of strong growth in Construction and Services. Our findings modify that impression mainly by indicating that, in terms of the contribution to GNP or employment, Manufacturing was not increasing its share in the late 1990s while the increasing trends in the share of Construction and some Services are quite long established.

As regards productivity levels, we found that, when measured in terms of the contribution to GDP per head, the high-productivity sectors are Manufacturing, Financial Intermediation and Real Estate, Renting & Business Activities, while Construction and

[15] This effect arises largely because there are quite a number of sectors that make some positive contribution to exports, while at the same time having imports of inputs that are larger than their exports, so that their contribution to *net exports* is negative.

Other Services have relatively low productivity. Therefore, a decline in the share of Manufacturing in GDP and a rise in the share of Construction and Other Services would tend to reduce aggregate GDP per head. However, when measured in terms of the contribution to GNP per head, Manufacturing, Construction and Services as a whole all have productivity levels that are not greatly different to the average for all sectors. Only Financial Intermediation stands out as having a productivity level that is well above average when measured in those terms. These findings imply that a decline in the importance of Manufacturing combined with a rise in Construction and Services would not have substantial adverse implications for overall productivity change measured in terms of GNP per head.

Finally, we found that the really significant contribution of Manufacturing has been as the major contributor to net exports. Sustainable overall growth of the economy is not feasible over the medium to long term unless some sector or sectors generate growth in net exports. For a long time that was largely the role of Manufacturing, and this has been the way in which it has made a key contribution to the economy, more so than through its direct production or employment. In the 1990s, Manufacturing accounted for about 100 per cent or more of net exports.

However, already in the 1990s and increasingly in the present decade, some service sectors have emerged as substantial contributors to net exports. This applies particularly to Real Estate, Renting & Business Activities, to Financial Intermediation and to Hotels & Restaurants, with the major export service categories being Computer Services, Business Services, Insurance and Financial Services. The emergence of rapid export growth in these sectors has been very important at a time when Manufacturing exports were slowing down in recent years. In absolute terms, however, Manufacturing remains by far the largest contributor to net exports at present, although with a declining share of the total.

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Appendix 1. Composition of Sectors

Total Sector	Comprising of these sub-sectors
Agriculture, Forestry & Fishing	01 Agriculture
	02 Forestry
	05 Fishing
Mining & Quarrying	10 Mining of coal, lignite, peat
	11 Crude petroleum
	13 Mining of metal ores
	14 Other mining and quarrying
Manufacturing	15 Manufacture of food products and beverages
	16 Manufacture of tobacco products
	17 Manufacture of textiles
	18 Manufacture of apparel
	19 Tanning, etc
	20 Manufacture of wood products excl. furniture
	21 Manufacture of pulp, paper etc.
	22 Publishing, printing, recorded media
	23 Manufacture of coke etc.
	24 Manufacture of chemicals / chem products
	25 Manufacture of rubber and plastic products
	26 Manufacture of non-metallic mineral products
	27 Manufacture of basic metals
	28 Fab. metal products excl machinery
	29 Mfr. of machinery / equipment nec
	30 Mfr. of office machinery / computers
	31 Mfr. of electrical machinery / apparatus
	32 Mfr. radio, tele, comm equipment
	33 Mfr. medical, precision, optical etc.
	34 Mfr. vehicles, trailers etc
	35 Mfr other transport equipment
	36 Furniture, manufacturing nec
	37 Recycling
Electricity, Gas & Water	40 Electricity, gas, steam, hot water

	41 Collection, purification, distr. of water
Construction	45 Construction
Distribution	50 Sale, maintenance, repair of vehicles, fuel 51 Wholesaling excl, motor vehicles 52 Retailing except motor, repair of personal goods
Hotels & Restaurants	55 Hotels / restaurants
Transport, Storage, Communications	60 Land transport, transport via pipelines 61 Water transport 62 Air transport 63 Supporting transport activities, travel agents 64 Post / telecommunications
Financial intermediation	65 Finance, excl. insurance / pensions 66 Insurance / pensions excl. social security 67 Auxiliary to financial intermediation
Real estate, Renting, Business Activities	70 Real estate 71 Renting of machinery and equipment 72 Computer and related activities 73 Research and development 74 Other business activities
Public Admin. Defence, Social Security	75 Public Admin and Defence, social security
Education	80 Education
Health & Social Work	85 Health and social work
Other Services	90 Sewage etc. 91 Membership organisations 92 Recreation, culture, sport 93 Other services 95 Private households with employees

APPENDIX 2: DERIVATION OF ADJUSTMENTS TO GVA

Table 2 presents data on "Adjusted GVA" in 2003, in which estimates of profit outflows are deducted from GVA in the sectors where the profit outflows mainly arise. The first two columns show GVA by sector, and each sector's percentage of total GVA. The third column shows estimates of profits of foreign-owned MNEs in a number of sectors. While there are no such estimates for more than half of the sectors due to a lack of data, there are good reasons to believe that profit outflows from foreign MNEs in those sectors would be such a small proportion of sectoral GVA that they can reasonably be ignored. Thus, profits of foreign MNEs could scarcely be significant in Agriculture. In addition, according to the *Census of Industrial Production 2003*, total profits in Mining & Quarrying were less than 9 per cent of GVA after deducting capital expenditure. Since profit outflows from foreign MNEs would probably be only a minority of that 9 per cent they would not be very important. The same source shows that total profits in Electricity, Gas & Water were actually negative in 2003 after deducting capital expenditure. In the case of the Construction industry, it is known, from the *Census of Building and Construction*, that profits of firms employing over 20 people in that sector accounted for just 10 per cent of the whole sector's GVA. Since it is likely that profit outflows from foreign MNEs in Construction would be quite a small minority of that 10 per cent of GVA, this is not a very significant issue in the Construction sector. It is clear that profits of foreign MNEs could not be a significant part of GVA in Public Administration & Defence, Education, and Health & Social Work, because they are mostly part of the public sector. Similarly, foreign MNEs are not likely to be an important part of the sort of activities that are included under Other Services.

Most of the estimates of profits of foreign companies that are included in the third column of Table 2 use data from either the *Census of Industrial Production* or the *Annual Services Inquiry*. These estimates of profits are based on GVA of foreign-owned firms

minus their labour costs minus their capital expenditure. The Financial Intermediation sector is an exception since it is not covered by the *Annual Services Inquiry*. In this case the estimate was derived by summing up the profits of foreign-owned companies that are included in the list of the top 80 financial companies in *The Irish Times Top 1000 Companies*, May 2003, 2004 or 2005. Data from the annual *Business & Finance* list of *Top 1000 Companies* was used to fill some gaps, and some estimation was also necessary to fill gaps since profit figures were not reported for every company concerned. In view of the method and sources used, the estimate for Financial Intermediation would probably be less reliable than the estimates presented for other sectors.

In the fourth column of Table 2, the total profit outflow figure is taken from the *Balance of International Payments* for 2003. It is the debit or outflow side of Direct Investment Income on Equity. This total amount is distributed among the sectors in proportion to their share of the estimated profits of foreign companies in the third column of Table 2. Note that the third column estimates profits of foreign companies (after capital expenditure), whereas the fourth column refers to outflows of profits (after capital expenditure and tax). It is appropriate, therefore, that the total in the fourth column turns out to be less than but fairly close to the total in the third column.[16]

The fifth column of Table 2 makes a further adjustment concerning the Real Estate, Renting & Business Activities sector. In the National Accounts, the GVA of that sector includes "imputed rent" that is attributed to the owners of owner-occupied dwellings. This imputed rent is equivalent to the rent that owner-occupiers could obtain if they were to rent out the property in which they live. Or to look at it another way, it is the value of the income-in-kind that they receive through having a dwelling available to them without having to pay a rent. This amount is included in national accounts as it is considered to measure part of a country's economic welfare. However, since this amount is not really the output of a particular sector in the same sense that GVA usually is, we deduct it from the GVA of the sector where it is included, in attempting to arrive at a more realistic assessment of the contribution made by different sectors to the Irish economy.

The final two columns of Table 2 show "Adjusted GVA" by sector. A sector's GVA is similar to its contribution to GDP, apart from an adjustment for product taxes and subsidies, whereas we have suggested that its "Adjusted GVA" is more similar to its

[16] O'Leary (1999) previously applied a method that is somewhat similar to ours, at least in the sense that he allocated the total national-level profit outflow in accordance with the incidence of estimated profits of foreign companies. However, one difference is that he was estimating profit outflows from regions, with a view to estimating regional incomes, whereas our focus is on sectors rather than regions. Another difference is that, given the data available at the time, he used "remainder of net output" as an approximate measure of profit in foreign-owned companies. The data that are available more recently allow us to use GVA of foreign-owned companies minus their labour costs and their capital expenditure, which is a considerably more precise measure of profits in foreign-owned companies.

contribution to GNP. However, it should be recognised that Adjusted GVA is not actually the same thing as the contribution to GNP. The difference between GDP and GNP is the net international flow of all factor incomes. By deducting estimated profit outflows (i.e. the debit or outflow side of Direct Investment Income on Equity) from GVA, what we have done is simply to deduct the most important type of factor income outflow, which is an outflow that can be identified as coming from specific sectors. But there are also other less important types of factor income flows (both outward and inward) that contribute to the difference between GDP and GNP, such as income on debt and portfolio investment income. For the most part these flows cannot be readily attributed to specific sectors and we do not make any attempt to take account of them. Thus our Adjusted GVA is not actually the same thing as the contribution to GNP, but it is much more similar to that than GVA would be. We believe that, compared to GVA, the Adjusted GVA figures give a more realistic indication of each sector's contribution to the Irish economy.