# Key Findings from the All-Island Business Model Project

## June 2006

Stephen Roper and James H Love
Aston Business School

Michael Anyadike-Danes, Karen Bonner, José Luis Iparraguirre D'Elia
Economic Research Institute of Northern Ireland

Stephanie Haller,Eoin O'Malley and Edgar Morgenroth

The Economic and Social Research Institute

This report has been compiled as part of the All Island Business Model project which is being conducted jointly for InterTradeIreland by Aston Business School, Birmingham, ESRI, Dublin, ERINI, Belfast, and Queen's University Belfast. The views expressed in the report are those of the authors alone.

# Key Findings from the All-Island Business Model Project

## 1. Introduction

The six studies in the All Island Business Model (AIBM) Working Paper series have for the first time compared a number of aspects of trade and competitive behaviour of businesses on either side of the border. These studies provide valuable new insights into aspects of the economic geography of the all-island economy and in this paper we summarise some of the key empirical results from these papers and their policy implications.

The AIBM working papers (see Annex 1) focus on some of the key themes of economic policy North and South including:

- ***Innovation*** among manufacturing firms in Ireland and Northern Ireland (Section 2).
- ***Productivity and profitability*** using data from the Northern Ireland ABI and the Irish Census of Industrial Production (Section 3).
- ***Export performance*** and the factors which shape export performance among firms in Ireland and Northern Ireland (Section 4).
- The ***competitive performance of firms*** in Ireland and Northern Ireland compared to those in other regions (Section 5).
- ***The distribution of productivity*** within different sectors in Ireland and Northern Ireland (Section 6).

  The factors which shape whether firms participate in ***cross border co-operation*** (Section 7).

  The ***impact of clustering*** on firm performance in Ireland and Northern Ireland (Section 8)

## 2. Innovation

This econometric analysis (AIBM Working Paper 1) focussed on the innovation activity of manufacturing firms in Ireland and Northern Ireland. The analysis based on over 3,600 periods of innovation activity highlights a number of key determinants of innovation success in manufacturing plants:

- R&D activity in the company
- Networks both within and outwith the supply chain
- Intermediate skills
- Grant support for product innovation

- Capital investment

We also find a strong positive link between product innovation success and sales and employment growth over a three-year period. Process innovation has a positive and significant short term effect on both productivity and growth. Product innovation success has a negative short-term effect on productivity, perhaps reflecting the disruption to production due to product change.

The analysis provides some support for the main thrust of policy, North and South, to promote innovation through a portfolio of policy instruments including grants, skills development and network building. It also suggests the importance of strong knowledge sources outside the supply chain (e.g. universities etc.) and the complementarity between innovation and measures designed to promote investment in new machinery and equipment. These effects emphasise the wide range of factors which can impact on innovation and the value of a systemic approach to innovation support.

# 3. Productivity and Profitability

Comparing the structure of costs in Northern Ireland and Irish manufacturing firms using data from the Northern Ireland ABI and Irish Census of Industrial Production emphasise the very different patterns of growth in the two economies and the resulting differences in cost sensitivities (AIBM Working Paper 2).

Productivity growth – driven largely by increased specialisation in high-tech industries and increasing capital intensity – has been a key element of growth in Ireland over past decades. Indeed, the evidence suggests that labour productivity growth has accounted for a larger proportion of Irish growth than that in many other countries. The evidence on Northern Ireland is less clear but levels of capital investment seem to have remained above the UK average and productivity growth has been relatively strong in UK terms. Productivity differs markedly between sectors and between Ireland and Northern Ireland in some sectors.

Some similarities are evident between aggregate cost structures in NI and Ireland:

- Spending on materials and other inputs as a proportion of sales is broadly similar in the two areas – 63.4 per cent in Northern Ireland and 66.6 per cent in Ireland.
- Value added as a proportion of sales is also broadly similar, accounting for 37.3 per cent of sales in Northern Ireland and 33.9 per cent in Ireland. In Ireland there is a notable difference between value added in Irish-owned firms (26.9 per cent of turnover) and externally-owned firms (35.5 per cent of turnover).
- Capital expenditure accounted for between 3.8 and 4.6 per cent of sales in both areas, although larger differences were evident between individual sectors.

Three key differences are also evident between the aggregate cost structures:

- Patterns of trade exposure differ markedly between NI and Ireland, with implications for product demand and business growth. Northern Ireland remains strongly linked to the UK market which accounts for 55 per cent of sales, but only 14 per cent of the sales of firms in Ireland. Irish-owned firms in Ireland and firms in Northern Ireland have similar levels of exposure to other EU markets, 15.1 and 10.6 per cent of sales respectively. This market accounts for a much higher percentage of the sales of externally-owned firms in Ireland (47.9 per cent), however.
- Labour costs as a proportion of sales differed significantly between areas accounting for 18.0 per cent of sales in NI, 16.4 per cent in Irish-owned firms but only 5.9 per cent of sales in externally-owned firms in Ireland.
- Profits accounted for 14.7 per cent of sales in NI compared to 6.5 per cent in Irish-owned firms but 25.9 per cent of sales in externally-owned companies.

Key interest focuses on the impact of cost increases on the productivity and profitability of industry, North and South. The productivity effect of cost increases depends on the importance of the cost item and the initial level of industry value added. For Northern Ireland as a whole, a 10 per cent increase in costs therefore resulted in a reduction in GVA of 17 per cent, a very similar amount to that which would occur in foreign-owned enterprises in Ireland. Value added in Irish-owned enterprises in Ireland would fall by more than a quarter given the same cost increase.

Similarly, the profitability effect of cost increases depends on the importance of the cost item and the initial level of profit margins. A 10 per cent materials cost increase has an average profitability impact of 30-40 per cent in both areas. Labour cost impacts (a 10 per cent rise) on profitability average 12 per cent in Northern Ireland, and 4 per cent in Ireland. Capital cost effects are in general smaller due to the lesser importance of capital as a cost item. In Northern Ireland a 10 per cent capital cost increase would reduce profitability by 3.1 per cent (1.6 per cent in Ireland).

The greatest sensitivity to cost rises is unsurprisingly in more traditional sectors where value added and profitability are generally lower and labour and materials costs tend to comprise a larger proportion of revenue. Innovation in products, processes or business models represents a key challenge for these sectors.

## 4. Exporting

Examining the characteristics of exporters in both Northern Ireland and Ireland (AIBM Working Paper 3) suggests that:

- Firms in Northern Ireland are more likely to be exporters if they are larger, more productive and engage in R&D, factors which are commonly found in similar analyses across other countries and which confirms the notion that successful firms become exporters, due to the associated costs and risks involved with entering new markets.

- In addition, a high share of purchases in total sales, also significantly contributes to the likelihood of being an exporter. In Ireland, firms with a high share of purchases in turnover, those engaged in R&D and foreign owned firms are also all more likely to be exporters.

- Overall however, the models suggest that firms with a higher productivity, a larger share of purchases in output, undertaking R&D and being foreign owned are more likely to export a larger share of their output.

The results suggest that being an exporter or having a good export performance is not a random event but can actually be characterised by a certain type of firm, and therefore policies tailored to specific firms can help in making the first step towards exporting and improving performance once that initial hurdle has been overcome.

The results presented in this study provide a useful model of the determinants of export participation and performance amongst manufacturing firms located in Northern Ireland and the Republic of Ireland and, as a result, have some important policy implications. One of the main findings is that the characteristics that influence the type of firms that export are not exactly identical to those which influence export intensity, therefore it might be helpful if export promotion policies distinguished between those designed to promote non-exporters to participate in export markets and those aimed at increasing the export share of current exporters.

A final comment on the analysis is that although it provides information on the type of firms that currently export, and hence allows for policy to be targeted more specifically, the study says nothing about causality, or the benefits to firms from exporting. The literature tends to suggest that good firms become exporters rather than the other way round, however if policy is concerned with increasing the number of exporters, then it must provide a rationale to the firms for doing so, without this there is no particular incentive to the firm to undergo the costs involved with selling overseas, particularly in a small firm economy where the costs of doing so are prohibitive. A further study looking at this aspect of the relationship between exporting and the firm would therefore provide a more complete picture and potentially provide policymakers with a justification for promoting firms to enter export markets as well as providing firms with the motivation for doing so. It may be well understood that exports are good for the economy as a whole but for the individual decision maker at the firm level, without any evidence of direct benefits to the firm, the costs, uncertainty and risks involved with exporting may far outweigh any potential advantages to the economy.

## 5. Competitive Performance in Industry

This review of competitive performance includes findings that are encouraging for both parts of the all-island economy (AIBM Working Paper 4).

In the case of Ireland, it has been apparent since at least the mid-1990s that there has been unusually rapid industrial growth led by foreign-owned multinational companies in a few high-tech sectors. However, the findings here indicate that, when compared with the international context of the EU, there have also been broader areas of successful competitive performance, both extending into other sectors and including Irish indigenous firms in the high-tech sectors. In addition, the relatively good competitive performance of industry in Ireland was already happening at the beginning of the 1990s and before the rapid macroeconomic growth of the "Celtic Tiger" period.

The economic performance of Northern Ireland may have looked less dramatic in some respects than that of Ireland. But again, when compared with the international context of the EU, the competitive performance of industry in Northern Ireland has been impressive. The North was very consistent in having an increasing share of EU production, EU employment and EU exports across a large majority of sectors.

There have been some more specific similarities in the competitive performance of North and South, notably the fact that a relative strong point for both of them has been the area of electrical, electronic and instrument engineering. On the negative side both of them have had difficulties in the area of textiles and clothing.

Both Ireland and Northern Ireland will no doubt continue to face competitive challenges in the years ahead. But the record of competitive performance in both parts of the all-island economy gives some grounds for confidence that future challenges can be tackled successfully.

## 6. Productivity Distributions

The first and most obvious finding of AIBM Working Paper 5 is the extent and nature of the skew in all the sectoral productivity distributions, North and South. Most of the mass of each distribution is concentrated at the left hand (relatively low) end with a long, thin, right hand tail of 'over-performing' firms. After log-transformation all the productivity distributions appear relatively normal, but the differences between them become more visible.

Relative distribution methods allow us to categorise sectors by their relationship to the reference distribution (in the North, all-firm, in the South all-establishment ) and we have seen how the relative contributions of the middle (location) and spread (shape) of each sector's distribution contributes to its distance from the overall reference distribution. There is one, potentially, important issue which we have not attempted to address here – the extent to which distributions may have shifted over time – but with relatively few

Northern observations, North/South sectoral comparisons, as well as, comparisons through time would not have been practicable.

## 7. Cross-border Cooperation

While around a third of all firms in Ireland and Northern Ireland engage in local co-operation, a smaller proportion – one in six in Northern Ireland and one in twelve in Ireland - engage in cross-border co-operation (AIBM Working Paper 6). Firms' participation in both types of networking can be explained in terms of the costs and benefits of each activity, suggesting a range of hypotheses related to the expected returns from co-operation, resource availability and uncertainty.

Our results suggest three main reasons why firms in Ireland and Northern Ireland may be more likely to engage in local rather than cross-border co-operation. First, distance from the border does turn out to be a significant factor in determining the probability of cross-border co-operation while it has no effect on the probability of engaging in local co-operation. This means that cross-border co-operation is less common in areas more distant from the border reducing the overall level of co-operation in the population, particularly in Ireland. Second, in Ireland at least, perceived barriers to cross-border co-operation are discouraging this type of co-operative activity with firms substituting instead more local co-operation.

Third, country uncertainty also influences cross-border co-operation with exchange rate uncertainty encouraging cross-border co-operation, perhaps as a means of currency hedging. In fact, however, the period covered by the survey (2000 to 2002) was a period of relative stability in the Euro-Sterling exchange rate which varied only +/- 2 per cent from 2000-2002, following a 7.5 per cent fall in 1999-2000 and followed by a 10 per cent appreciation in 2002-2003. It is therefore likely that the relative stability of exchange rates over this period may actually have been reducing the incentives for firms to engage in cross-border co-operation. Resource effects, and the effects of local market uncertainty are also significant in the estimation but have a broadly similar effect on the probability that firms will engage in cross-border and local co-operation. Essentially similar factors explain the higher incidence of cross-border co-operation in Northern Ireland: a larger proportion of the population firms in Northern Ireland are proximate to the border than in Ireland; and, there is no evidence of any perceived barrier to cross-border co-operation in Northern Ireland as there is in Ireland.

Our results clearly suggest the economic motivations which shape firms' decisions to engage in local and cross-border relationships, and the links between these relationships and firms' other attributes, e.g. whether or not they have in-house R&D. In Ireland, too, our results suggest some perceived – although unspecified – barriers to the development of cross-border co-operation, an issue perhaps worthy of further investigation. What is less clear, however, is exactly what further policy actions could be undertaken to boost levels of cross-border co-operation if this is felt to be desirable given the dominance of distance, perceived barriers and country uncertainty in shaping levels of cross-border co-operation. Two avenues are possible, however. First, steps could be taken to increase firms' understanding of cross-border market opportunities and business culture. Our results suggest this would reduce country uncertainty – in much the same way as participation in cross-border trading would work – and increase the extent of cross-border co-operation. Second, our results suggest that current policy initiatives to increase business R&D activity in Ireland and Northern Ireland, and strengthen firms' skill base are both likely to have indirect benefits in terms of increased cross-border co-operation.

## 8. Clustering and Economic Performance

This study provides important evidence on the impact of spatial clustering of firm performance on the Island of Ireland. The study adopts a direct approach where clusters were first identified on the basis of a number of criteria. In a second step these clusters were used in an empirical model of employment growth at the plant level. Overall, the analysis shows that while there appears to be a positive impact of clustering on firm employment growth, that impact was imprecisely measured and thus often not statistically significant. Using more disaggregated data the study shows that while clustering had a significant positive effect in some sectors for some time periods, one cannot conclude that clusters are unequivocally associated with better firm level performance.

These results have important policy implications in that they suggest that the simple co-location of firms in a particular sector is not going to systematically result in improved economic performance. Rather, such improved performance will be sector and time specific. Of course clustering can also have a negative impact. If a cluster is subject to a significant negative sectoral shock then linkage to other firms locally may accelerate the negative impact. Our results also concord with the findings in earlier studies which show that the correlation between specialisation and productivity is significantly negative. Thus a more diversified production structure in agglomerations appears to lead to better economic performance. This concept is closer to the traditional agglomeration economies rather than the clustering ideas. It would therefore seem useful to conduct further research on the impact of agglomeration on economic performance.

## Annex 1: All Island Business Model Working Papers

| | Title | Authors | Completed |
|---|---|---|---|
| 1 | Innovation Success And Business Performance - An All-Island Analysis | Stephen Roper And James H Love | July 2005 |
| 2 | Productivity, Profitability And The Cost Structure Of Manufacturing Firms In Ireland And Northern Ireland | Stephen Roper And Eoin O'Malley | July 2005 |
| 3 | Who Exports? A Firm-Level Study Of The Characteristics Of Exporters And The Determinants Of Export Performance For Northern Ireland And The Republic Of Ireland | Michael Anyadike-Danes<br>Karen Bonner<br>Stephanie Haller<br>Eoin O'Malley | May 2006 |
| 4 | Competitive Performance In Industry: An All-Island Review | Eoin O'Malley<br>Michael Anyadike-Danes | May 2004 |
| 5 | How Is Competitiveness Distributed In Irish Industries? | Michael Anyadike-Danes<br>Stephanie Haller | April 2006 |
| 6 | Cross-Border And Local Co-Operation On The Island Of Ireland: An Economic Perspective | Stephen Roper<br>Eoin O'Malley | November 2005 |
| 7 | The Impact of Spatial Clustering on the Economic Performance of Firms: The Case of Ireland | Edgar Morgenroth<br>José Luis Iparraguirre D'Elia | December 2006 |

**By**

**Economic and Social Research Institute**

and

*Economic Research Institute of Northern Ireland. Belfast*

Draft Final Report

**1st of December 2006**