



*Border, Midland & Western*  
Regional Assembly  
*Shaping the Region*



Ireland's EU Structural Funds  
Programmes 2007 - 2013

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# Submission to the Evaluation of the Science, Technology and Innovation Programme

**June 2008**

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## 1. Introduction

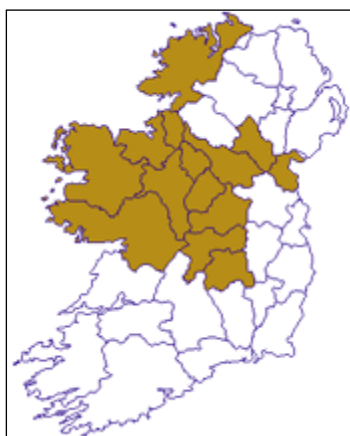
The Border, Midland and Western (BMW) Regional Assembly welcomes this opportunity to make a submission to the evaluation of the Science, Technology and Innovation (STI) Programme. This paper will examine the coherence between the STI Programme and the Government objective of balanced regional development as set out in the National Development Plan 2007-2013 and will discuss a number of key policy proposals to improve the impact of STI in the BMW Region.

### The 6 Key Issues for the BMW Region

<b>1</b>	<b>STI Policy is Reinforcing Regional Imbalances in Ireland</b>
<b>2</b>	<b>Consistent Under-Investment in the BMW Region Across All Research Programmes</b>
<b>3</b>	<b>Dedicated R&amp;D Fund for the BMW Region is Required – Weak Institutions Require Focused Supports</b>
<b>4</b>	<b>The Third Economic Development Role of Third Level Institutions Remains Under-Developed</b>
<b>5</b>	<b>Poor Levels of Interaction between Research Institutions &amp; Private Enterprise</b>
<b>6</b>	<b>Regional Innovation Strategies for Each Sub-Region are Required</b>

## 2. Background to the Border, Midland and West (BMW) Region

The BMW Regional Assembly was established in 1999 in order to give effect to the designation of two regions in Ireland for structural funds purposes. The Regional Assembly acts as the Managing Authority for the BMW Regional Operational Programme under the NDP 2007-2013, and also monitors the expenditure and impact of NDP and EU funds in the Region and seeks to ensure that national programmes take regional issues into account.



The BMW Region covers thirteen counties which represents 47% of the land mass of Ireland, 27% of the population and produces 19% of GDP. The Region is predominantly rural with the exception of Galway City and has a lower percentage of high-value added economic activities than the Southern and Eastern (S&E) Region. A comparison of unemployment rates signifies a recent convergence between the Regions

however most of the growth in employment in the BMW Region has taken place in low value-added industries. The economic gap between the Regions is highlighted by disparities that exist in disposable income and, particularly Gross Value Added (GVA) per person.

The principal regional socio-economic indicators are shown below in Table 1.

**Table 1: Regional Socio-Economic Indicators**

	Year	State	BMW	S&E
<b>*Population (000s)</b>	2006	4,239.8	1,134.3	3,105.5
<b>*Labour Force (000s)</b>	2008 Q1	2,237.2	580.5	1,656.7
<b>*Unemployment Rate (%)</b>	2008 Q1	4.6	5.3	4.3
<b>*Disposable Income per Capita (state = 100)</b>	2005	100	91.7	103.0
<b>*GVA per Person (state =100)</b>	2005	100	70.3	110.8
<b>*% of Labour Force with a Third Level Qualification</b>	2007 Q4	34.3	28.9	36.2
<b>No. of Universities</b>	2007	7	1	6
<b>No. of Institutes of Technology</b>	2007	14	5	9

*\*Source: CSO*

### **3. A Rationale for Investment in Science, Technology & Innovation**

Low income per head and higher levels of unemployment which characterise the BMW Region, are symptoms of the gap between the richest and poorest regions and emerge as a result of a poor developmental capacity of regions. Regions such as this tend to struggle due to a relative absence of physical infrastructures, highly qualified labour and research and technological development activity. Less favoured regions also tend to have little or no social capital from which they can draw, this ability to seek joint solutions to common problems otherwise known as 'invisible factors' in economic development are just as important as physical capital<sup>1</sup>.

In the context of strong economic performance of the Irish economy since the 1990s, one of the key challenges for the BMW Region consistent with Government policy, is to develop a successful innovation-led knowledge-based economy to respond to the effect of global forces on production. In order for the BMW Region to succeed in its transition to a knowledge economy, a focused R&D policy is required to stimulate innovation and facilitate economic development.

The need to innovate is also acknowledged as critical in order to offset mounting international competition which brings with it an increasing pressure for improved levels of productivity, quality and efficiency. Empirical evidence shows that a strong link exists between investment in the research and innovation base of an economy and

<sup>1</sup> Doeringer, P. & Terkla, D. 1990. "How Intangible Factors Contribute to Economic Development: Lessons from a Mature Local Economy", World Development, Vol. 18, No.9, p.1295-1308.

sustainable economic growth. It also demonstrates that the sustainability and therefore the longevity of enterprises are positively correlated to those enterprises that engage in R&D. These enterprises also provide higher quality and better paid employment<sup>2</sup>. Therefore a successful innovation and technology transfer culture is critical for the future growth and prosperity of the BMW Region and for the Irish economy.

#### **4. Science, Technology & Innovation Programme**

While it is widely acknowledged that a country's investment in Science, Technology and Innovation will assist the transition to a knowledge driven economy, the economic impact and efficiency of delivery are the key factors that will ultimately determine its success. Taking the impetus from the 1992 Culliton Report<sup>3</sup> which advocated an increased prominence for technological development in industrial policy, there has since been a significant re-orientation of Irish public policy towards the creation of a 'knowledge based society' and consequently a much greater credence and allocation of resources has been accorded to Science, Technology and Innovation (STI). STI has received considerable investment in the previous NDP 2000-2006 (€2.4bn) and has been allocated even greater resources in the latest NDP 2007-2013 (€8.2bn).

This strategy for STI is articulated in the Strategy for Science, Technology and Innovation (SSTI) 2006-2013 which sets out a vision for Ireland to be '*internationally renowned for the excellence of its research, and will be at the forefront in generating and using new knowledge for economic and social progress, within an innovation driven culture*'. The strategy's key objective is the development of a strong knowledge intensive economy and to this end its budget is divided among 3 key areas; (i) University Research Infrastructure (ii) Enterprise Support (iii) Research and Commercialisation programmes.

##### **4.1 Changed STI Landscape**

The implementation of this new economic policy direction in Ireland has had significant positive impacts. The collective political will to develop Ireland's STI policy has resulted in a transformation of the policy landscape for scientific and technological endeavour in Ireland. The most important developments have included:

1. Significant increases in state spending on R&D, from €221m in 1997 to €995m in 2007<sup>4</sup> which represents a 78% increase in exchequer R&D expenditure over this ten year period.
2. The establishment of Science Foundation Ireland (SFI) in 2000 which has allocated €24.8m<sup>5</sup> in research grants in the biotechnology and information and communication technology (ICT) sectors since its inception. The remit has recently (May 2008) been extended to include sustainable energy and energy-efficient technologies research.

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<sup>2</sup> Kearns, A. and Ruane, F. (1999). 'The Tangible Contribution of R&D Spending Foreign-Owned Plants to a Host Region: a Plant Level Study of the Irish Manufacturing Sector (1980-1996)' Economic Papers 997. Trinity College Dublin, Department of Economics.

<sup>3</sup> Culliton, J. 1992. A Time for Change: Industrial Policy for the 1990s, Report of the Industrial Policy Review Group. Dublin: Stationary Office.

<sup>4</sup> Forfás. 2007. Forfás R&D Surveys: The Science Budget 2006/2007 The First Findings. December 2007.

<sup>5</sup> Figures supplied by SFI for figures to the end of June 2007.

3. The Programme for Research in Third Level Institutions (PRTLTI) was created under the 2000-2006 National Development Plan to build infrastructure in third-level institutions, to develop research capacity, to facilitate institutional strategies and inter-institutional collaboration. There have been four cycles of PRTLTI to date totaling €60m of investment.
4. Other developments have included the creation of the two research councils, the Irish Research Council for Science, Engineering and Technology (IRSCET) and the Irish Research Council for Humanities and Social Sciences.

The greatest impact of this new strategy has been that for the first time Ireland is now in a position to determine its own R&D investment priorities. Whereas up until the late nineties Irish research funding was dominated by the European Framework programmes and as a consequence national priorities were determined by Europe, which was ultimately fragmenting the national effort.

## **5. Shortcomings of the STI Policy: Technology Transfer & Innovation**

Serious deficiencies exist in the roll-out of Ireland's STI Strategy and in particular research performance is not adequately paired with the economic utilisation of results. One of the core objectives of STI policy is to facilitate strong industry-academia collaboration in order to maximise the economic benefits of basic research, however collaboration between third-level institutions (TLIs) and industry remains low as do levels of innovation within industry (as will be illustrated in the this section). Without real collaborative research tangible benefits for enterprise cannot be realised. The prospect of Ireland delivering as a 'knowledge economy' remains weak unless there is a significant increase in the number technology transfers and in the intensity of innovation, across all sectors and in all regions.

### **5.1 Weak Levels of Interaction Between TLIs & Enterprise**

Evidence from research carried out by O'Leary and Jordan<sup>6</sup> (2007) on business innovation in the South-East and South-West of Ireland found that the majority of companies surveyed, rarely or never interact with the region-based education sector. Another key conclusion was the inefficiency of outcomes of industry-academia collaboration. They found the greater the frequency of direct interaction with TLIs the lower the probability of both process and product innovation occurring in these businesses.

A recent report from the Expert Group on Future Skills Needs<sup>7</sup> on the skills and research needs of the international financial services sector also found there was very little evidence of the technology transfer from TLIs to industry. In addition it was also reported that there is a 'general lack of interest from industry in research activity in Irish universities'<sup>8</sup>.

Further evidence from the CSO and Forfás<sup>9</sup> showed that the levels of cooperation with TLIs was greatest with larger enterprises with more than 250 employees (26.7%) but

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<sup>6</sup> Jordan, D. & O'Leary E. 2007. "Is Irish Innovation Policy Working? Evidence from High-Technology Businesses". Dublin: Statistical and Social Inquiry Society of Ireland, October 2007.

<sup>7</sup> EGFSN. 2007. Future Skill and Research Needs of the International Financial Services Industry. December 2007.

<sup>8</sup> Ibid p.138.

<sup>9</sup> CSO & Forfás. 2008. Community Innovation 2004-2006 First Findings. June 2008.

cooperation with small (4.3%) and medium sized enterprises (9.7%) remained very low. Just 6.8% of all firms who responded to the survey had cooperated with a TLI.

## **5.2 Low Levels of Innovation**

Hewitt and Roper<sup>10</sup> found that innovation by Irish manufacturing firms remained relatively static over a 15 year period to 2005, despite strong economic growth during the period. Between 1991 and 2005 the proportion of manufacturing plants in Ireland making changes to their existing products or introducing new products rose only marginally, from 63% to 68%. They also showed that the proportion of manufacturing plants in Ireland making changes to their existing processes or introducing new processes has declined from 58% in 1996 to 51% in 2005. In the early 1990s 46% of sales from manufacturing plants were coming from products that had been improved or newly introduced. By 2005 this proportion of sales had dropped to 34%. This means that plants in Ireland were becoming more dependent on established products for which the profit margins are typically lower.

The deficit of innovation and lack of successful industry/academia interaction taking place in Ireland reinforces the need for SSTI to delivery as a driver of innovation. If Ireland is to build a strong knowledge-based economy, achieve projected levels of economic growth and remain competitive internationally, then regional innovation must rise to the top of the policy agenda.

## **6. Shortcomings of the STI Policy: Reinforcing Regional Imbalance**

The SSTI acknowledges that companies in regional locations are at a disadvantage when it comes to accessing support for innovation due to the large concentration of scientific and technological resources in the major cities. However current government R&D expenditure does not reflect the strategic aims of the National Spatial Strategy and is in fact reinforcing the imbalance between regions.

The assertion in SSTI 2006-2013 that the concentration of research activity is consistent with the National Spatial Strategy in a small number of national research centres is consistent with the National Spatial Strategy<sup>11</sup>, is open to serious questioning. R&D investment has been overwhelmingly directed towards existing centres of excellence which are invariably found in more prosperous regions and this reproduces the gap between underperforming and prosperous regions i.e. between the BMW Region and the S&E Region. This reflects the outcome of a study from the European Spatial Planning Observation Network (ESPON)<sup>12</sup> which found that European Union R&D policy was adversely impacting on spatial balance by reinforce existing concentrations of activity. The economic geography literature on spill-overs from university research suggests that spill-overs are quite limited in distance. In the Irish context, this implies that most of the benefits of the increased public investment in HERD (Higher Education Research and Development) will accrue to the university cities, and particularly Dublin with four universities in its vicinity. For this reason, a territorial impact analysis of STI policy is merited.

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<sup>10</sup> Hewitt-Dundas, N & Roper, S. 2008. Ireland's Innovation Performance: 1991 to 2005. ESRI Quarterly Economic Commentary. Summer, p.46-68.

<sup>11</sup> Department of Enterprise, Trade and Employment. 2006. Strategy for Science Technology and Innovation. Government Publications: Dublin. p. 86.

<sup>12</sup> ESPON. The Territorial Impact of EU Research and Development Policies. December 2005.

## 6.1 Under-Investment in BMW Region

1. The total expenditure in the BMW Region of just under €300m represents just 15% of RTDI expenditure nationally under the National Development Plan (NDP) 2000-2006<sup>13</sup>. Given the importance of RTDI as a driver of regional development, the low levels of expenditure that currently exist will have a significant negative impact on the competitiveness of the Region.
2. Since its inception Science Foundation Ireland (SFI) has allocated €24.8m<sup>14</sup> in grants, only 9.3% of which went to researchers in the BMW Region.
3. The Programme for Research in Third Level Institutions (PRTLII) which is operated by the Higher Education Authority (HEA) has at its core the development of research infrastructures and research programmes for third level institutions. The first three cycles of PRTLII represented a €605m investment in research in Ireland. However, just 12% of this fund was invested in third level institutions in the BMW Region. It is also notable that NUI Galway (NUIG) received 93% of the total investment for the Region. Of the BMW Region's five Institutes of Technology - Athlone Institute of Technology (AIT), Dundalk Institute of Technology (DKIT), Galway Mayo Institute of Technology (GMIT), Letterkenny Institute of Technology (LYIT) and the Institute of Technology Sligo (IT Sligo) - only AIT and IT Sligo benefited from direct funding under this programme.

Funding awarded under the fourth cycle of PRTLII in 2007 has maintained this trend of under-investment in the BMW Region. NUIG represents the only third level institution in the Region to be awarded funding in the latest cycle of this programme which is valued at €260m.

4. The Technological Sector Research Initiative (TSRI) is a research fund available on a competitive basis to the fourteen Institutes of Technology for the purpose of supporting and strengthening the research capacity of the sector by enabling research projects. The total funding awarded under the 2000-2006 NDP of €38.9m administered by the Council of Directors of Institutes of Technology. Due to the limited budget available the Institutes of Technology cannot significantly improve their research infrastructure. Given the crucial role of the five Institutes of Technology (IoTs) in the development of the BMW Region and the lack of funding awarded under PRTLII it is once again a disappointment to note that just 19.4% of the TSRI funding has been awarded to the IoTs in the Region..
5. The Irish Council for Science, Technology and Innovation (ICSTI)<sup>15</sup> found that the gap in the availability of applied research capability that enterprises can readily access and the low absorptive capacity of enterprises for research were the two key constraints to enterprise-higher education research collaborations. These are in part being addressed by Applied Research Enhancement (ARE) Programme targeted at the Institutes of Technology and administered by Enterprise Ireland. This programme has been introduced to develop research capacity in areas of strategic importance to the individual colleges and of relevance to industry both regionally and nationally. This programme aims to facilitate a maximum of three centres of excellence in each of the Institutes of Technology. The funding available for each project is €1.25m and so far four centres have benefited from

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<sup>13</sup> Department of Enterprise, Trade and Employment. Annual Implementation Report 2006 for the Productive Sector Operational Programme 2000-2006.

<sup>14</sup> Figures supplied by SFI for figures to the end of June 2007.

<sup>15</sup> ICSTI. Promoting Enterprise-Higher Education Relationships. Forfás. March 2007.

this programme in the BMW Region. The scale of this programme which is potentially of great benefit to regional enterprises and development compares very unfavourably with the main programmes such as PRTL and SFI.

## **6.2 Impact of Current Policy on R&D Expenditure in the BMW Region**

Latest figures from published by Forfás show that the BMW Region is lagging significantly behind the S&E Region in terms of BERD and HERD. The regional distribution of R&D spending by businesses (BERD) in 2005<sup>16</sup> showed that just 25.7% was occurring in the BMW Region. BERD figures also highlight the concentration of research activity in Dublin. These figures show that 41.2% of all business expenditure R&D occurring in Dublin, the remaining 33.1% of R&D investment occurred in the rest of S&E Region.

This trend is further reinforced by the findings of The Audit of Innovation in the BMW Region<sup>17</sup>, which concluded that the Region had an innovation deficit and was also less entrepreneurial than the S&E Region. It showed that the volume of new start-up businesses in the BMW Region was only half that in the S&E Region on a pro-rata basis. It also illustrated that the link between industry and third level institutions in the BMW Region was very weak.

This is also reflected in the Higher Education R&D (HERD) figures for 2006<sup>18</sup> which found that only one BMW institution (NUIG) featured in the top ten in terms of research expenditure and total HERD expenditure for the BMW Region was just 14.8% of the total figure of €600m in 2006.

## **7. Further Challenges for STI Policy**

### **7.1 Achieving the Barcelona R&D Expenditure Target**

The European Union has set out an ambitious goal to be the world's most competitive, most dynamic and knowledge-led economy by 2010. In order to achieve this it established R&D expenditure goals at the 2002 European Council in Barcelona. This target set out that by 2010 the average EU expenditure on R&D should reach a proportion of 3% of GDP, and two thirds of this investment should derive from enterprises. Ireland has set a national target to achieve R&D expenditure of 2.5% of GNP by 2010. It is questionable if that target will be reached as the GERD (Government Expenditure on Research and Development) as a percentage of GNP was 1.56% in 2006 up from 1.48% in 2004<sup>19</sup>.

It is important to consider that the level of expenditure on science and technology is only one criteria for the assessing the innovative capacity of the national system, the same inputs can be associated with different outcomes. It is equally important that the stock of social capital is well-developed which can facilitate collaboration between firms and the science base or between finance and industry.

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<sup>16</sup> Forfás. 2007. Research & Development Performance in the Business Sector Ireland 2005/6. January 2007.

<sup>17</sup> BMW Regional Assembly. 2004. Audit of Innovation in the BMW Region. BMW Regional Assembly: Ballaghderreen.

<sup>18</sup> Forfás. 2007. The Higher Education R&D Survey 2006 (HERD): First Findings. August 2007.

<sup>19</sup> Forfás. 2007. Research and Development Statistics in Ireland 2006 – at a Glance. March 2007.

## **7.2 Developing the ‘Third Role’ for Third Level Institutions (TLIs)**

The impact of Government policy which aims to deliver a knowledge economy is that the old core remit of simply educating and researching is now evolving towards greater research activity and even stronger collaboration with industry. TLIs are also increasingly required to engage with others in their regions, provide opportunities for lifelong learning and contribute to the development of knowledge-intensive jobs which will enable graduates to find local employment and remain in their communities<sup>20</sup>. This newly evolving ‘third role’ for TLIs requires greater consideration by government policy. The third-level sector cannot be expected to deliver seamlessly or painlessly on a broader mandate in a short timeframe as this involves a change in institutional culture, structure and orientation.

## **7.3 Building Regional Development Capacity**

It is widely acknowledged that regional centres and city regions are the most appropriate loci on which to build regional and national competitiveness. Regional innovation capacity is one of the building blocks of regional competitiveness. Irish STI policy provides clear national strategic direction but lacks an essential complimentary element – regional innovation strategies. Successful EU regions provide clear evidence that coherent regional innovation systems with comprehensive strategies at regional level, multi-agency participation, focused resources and explicit targets linked with rational objectives are an essential element for achieving high levels of regional innovation. Many of the individual elements of such strategies are already in place but there are no over-arching strategies for each region, with the possible exception of the Shannon Region.

## **8. Policy Proposals**

### **(i) Establishment of a Research and Development Fund for the BMW Region**

This fund should have two strategic aims:

- (i) To build the research capacity of the higher education institutes in the BMW Region and in particular the Region’s Institutes of Technology
- (ii) To develop research linkages between industry and higher education which impact on the regional economy

The BMW Region must significantly raise its research and commercialisation capacity by investing in focused, market-led applied research infrastructure and facilities that address the specific needs of enterprise development. This can only be achieved through a substantial increase in the level of investment currently experienced in the BMW Region. Both targets have been partially addressed by the TSRI and the ARE programmes however these initiatives will continue to have a limited impact as they both remain severely under-funded. Lónra, the BMW regional higher education network, is already in place in the Region and could act as a strategic partner to progress this initiative.

### **(ii) Development of Regional Innovation Strategies**

The national agencies responsible for science and innovation policy, led by Forfás should collaborate with regional level bodies, third level institutions and private sector bodies to develop multi-annual comprehensive regional innovation strategies. These are the ‘missing link’ in the governance national STI policy. These complementary

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<sup>20</sup> OECD. 2007. Higher Education and Regions: Globally Competitive, Locally Engaged. OECE: Paris.

strategies could be developed on a pilot basis initially, drawing on the extensive experience of regional development agencies in several EU countries<sup>21</sup>. The Regional Operational Programmes (OPs) 2007-2013 provides a mechanism through which 40% of the cost of developing such strategies in both NUTS II Regions may be recouped from the European Union through the experimental actions strands of the OPs.

**(iii) Innovation Support Services Should Reflect the Micro-Economic Reality**

Innovation support services should not have a one-size-fits all approach. Rather they should be predicated on the micro-economic reality of their delivery location. First generation EU programmes have often been criticised for not paying sufficient attention to the social, institutional and commercial dimension of innovation<sup>22</sup>. This criticism can also be levelled at Ireland's innovation policy. It is vital to understand that the fundamentals of the design and delivery of support policies need to consider linking supply-side initiatives to local demand-side conditions. The need to address the problem of demand is should also be recognised as important as the issue of supply.

**(iv) Completion of a Territorial Impact Analysis on R&D Programmes**

As this paper has outlined the allocation of research funding has not reflected or taken due consideration of the National Spatial Strategy and has further reinforced imbalanced regional development by providing additional support to existing clusters of activity. By conducting *A Territorial Impact Analysis of Research Funding In Ireland* the impact of research investment from a multi-criteria regional perspective could be examined as well as the benefits of applying multiple-criteria to the decision-making process for the allocation of research funding.

**(v) Development of Improved Synergies between National R&D Policy and Regional Policy**

The development of improved synergies between national R&D policy and regional policy does not involve separating regional and national policies but rather implies taking into account the social and economic realities and needs of different regions when policy is being developed. Improving these synergies would facilitate more strategic and effective use of current and future instruments in the field of research which would ultimately benefit balanced regional development in Ireland. Improved national competitiveness hinges on competitive regional locations however national R&D policy does not support this currently.

**(vi) Incentivise Collaboration with Weaker Institutions**

The almost exclusive emphasis on research "excellence" has consistently delivered sub-optimal outcomes from a BMW Region perspective. A possible solution would be the inclusion of multi-criteria analysis by awarding of higher points to proposals which engage the "weaker" institutions as partners in collaboration proposals. The present regime favours the inclusion of stronger partners with established research capacity thus widening the research capacity gap further.

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<sup>21</sup> The European Commission Regional Technology Plans, see Henderson, D. 2000. "EU Regional Innovation Strategies", in *European Urban and Regional Studies*, Vol. 7, No. 4, p. 347-358.

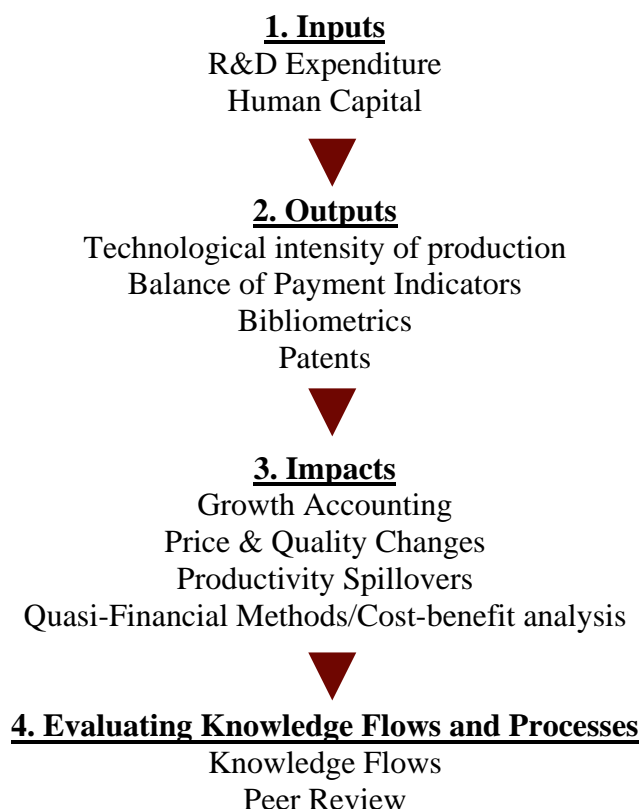
<sup>22</sup> CEC. 1994. *Competitiveness & trends in the regions*. CEC: Brussels.

### **(vii) Regional Investment Strategies**

Successful innovative business need to operate in an environment with world class infrastructure, connectivity, and access to a highly qualified labour force. Regional investment strategies should be designed to enhance the endowments of the regions which are fundamental to their competitiveness. Many regions in Ireland (including the designated Gateway Regions) require additional investment to provide this environment. National Investment strategies must complement STI policy at regional level. The development of a consensus on a strategy to improve the environment for business growth, innovation and competitiveness of the underperforming regions should also focus on maximising the economic development impact of TLIs in the regions. There is an opportunity for an increase strategic role for Lónra in the BMW Region.

### **8.2 Evaluation of STI Policy**

A more comprehensive mechanism to capture the broad targets, including regional targets of STI policy needs to be put in place. This method could be adopted from the work of Aidan Keane<sup>23</sup> to ensure that the wide ranging impacts of STI policy are considered and evaluated. A summary of the Keane Evaluation Method is illustrated below:



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BMW Regional Assembly  
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<sup>23</sup> See Keane. A. 2001. Indicators and Evaluation for Science, Technology and Innovation. NUIG Department of Economics, May 2001.