

# **ECONOMIC ADVISORY GROUP**

## **THE IMPACT OF REDUCING CORPORATION TAX ON THE NORTHERN IRELAND ECONOMY**

**MAY 2011**



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## **i. The Economic Advisory Group**

The Economic Advisory Group<sup>1</sup> (EAG) was established following a recommendation from the Independent Review of Economic Policy. The EAG is an independent advisory body, comprising expertise from the fields of economics, business and skills, and provides economic advice on the Northern Ireland economy to the DETI Minister. This paper sets out research undertaken on behalf of the EAG to help inform its response to the HM Treasury consultation paper on rebalancing the Northern Ireland economy. In particular, the Group commissioned Oxford Economics (OE) to produce a number of scenarios, with various assumptions, to assess the impact of a reduced rate of corporation tax on the Northern Ireland economy.

The EAG will shortly publish its response to the HM Treasury consultation paper. In the interim, the Group is content that the findings from this paper are used by other stakeholders as they make their own responses to the consultation exercise.

The EAG wishes to acknowledge the support and assistance of the Secretariat and Oxford Economics in the production of this paper. In addition, it should be noted that the EAG is undertaking further work to provide advice on the Northern Ireland economy, including issues relating to R&D / Innovation, Skills, Infrastructure and Planning.

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<sup>1</sup> Further detail on the Economic Advisory Group can be found at: [www.eagni.org](http://www.eagni.org)

## ii. Executive Summary

### Background

The UK Coalition Government and Northern Ireland Executive have common objectives to rebalance the Northern Ireland economy by increasing the size of the private sector and to drive faster economic growth.

In its Programme for Government, the UK Government included a commitment to 'produce a government paper examining potential mechanisms for changing the corporation tax rate in Northern Ireland'. This commitment was subsequently developed to include examining proposals for economic enterprise zones and other economic reform options. A consultation paper on these proposals was published in March 2011. This paper also outlined the Government's new economic approach to rebalancing the UK economy, arguing that it has become too reliant on growth from a limited number of sectors and regions.

To fulfil its role in providing independent economic advice to the DETI Minister, the Economic Advisory Group (EAG) commissioned analysis to help estimate the impact of a lower rate of corporation tax on the Northern Ireland economy.

### Structure of the Report

This paper has five sections:

**Section 1** Outlines the HMT consultation paper and the range of issues that have been identified for discussion.

**Section 2** Presents the Oxford Economics (OE) forecasts on the expected development of the Northern Ireland economy over the short, medium and longer-term in the absence of policy reform.

**Section 3** Outlines the underpinning OE economic model (in terms of structure, data and assumptions) that has been used to estimate the impact of a reduced rate of corporation tax on the Northern Ireland economy. The assumption is of a prior policy announcement in 2012 to reduce corporation tax in Northern Ireland to 12.5% by 2014.

**Section 4** Details the output from the economic model across three scenarios – central, high and low. This includes projections on a range of costs and benefits, including the impact on economic growth, job creation and convergence to living standards in the UK.

**Section 5** Includes analysis on the current global trends of corporation tax and the stock/flow of Foreign Direct Investment (FDI). The section is also supplemented with a brief commentary on the experience from other small open economies, namely the Republic of Ireland and Estonia.

## Key Assumptions

Certain assumptions have been made in running the OE model to produce the economic forecasts contained in this report. For example:

- While the baseline assumes no overall change to the Invest NI budget it does assume that the mix within the budget alters. For example, the baseline forecast assumes a reduction in Selective Financial Assistance<sup>2</sup> (SFA, circa £40m) from 2013. This reflects prospective changes to Regional Aid post 2013 (with already significant reductions having taken place from 1 Jan 2011). However, given the emphasis on rebuilding the Northern Ireland economy (as part of the forthcoming economic strategy<sup>3</sup>), a proportion of SFA spend has been retained throughout the forecasting period. It is clear that if SFA were to be kept at a higher level than that suggested in this paper then further employment gains would be realised.
- The resource saved from SFA (circa £40m) has been redistributed into Invest NI's R&D / Innovation programmes. This has the effect of increasing, within the baseline, productivity levels and also employment. A change of this nature reflects the importance of providing support to businesses to develop their Innovation and R&D capability (which may not necessarily come as part of lowering corporation tax). This also reflects the reality that with a growing business base, with new and valued FDI entering Northern Ireland as a result of corporation tax changes, there will also be increased investment required for R&D / Innovation and Skills.
- In the corporation tax scenarios (in order to meet the Azores criteria, to avoid reductions in corporation tax being deemed as State Aid), the model assumes an initial decrease in the block grant. This reduction in the block grant cost peaks in 2016 at £242m<sup>4</sup> (or £275m in current prices) or approximately 2.7% of the block grant. This feeds through initially to reductions in public sector employment within the model. However, it is recognised that the impact of any reductions in the block grant can be

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<sup>2</sup> Selective Financial Assistance is a major Invest NI programme aimed at supporting investment and related projects to increase business productivity in Northern Ireland

<sup>3</sup> The recent NI Budget includes provision for a short-term employment scheme to help rebuild the local economy in the aftermath of the recession (amounting to circa £19m).

<sup>4</sup> In 2006 prices, further detail at Table 4.4. The reduced block grant reflects the assumption that the 12.5% corporation tax rate is applied to trading profits only (as in the Republic of Ireland).

managed in a variety of ways. For example, the Northern Ireland Executive, within the last budget period, was able to manage some very significant public expenditure pressures without any apparent adverse impact on overall public sector employment. It should also be noted that the anticipated impact on the block grant does not necessarily result in an economic loss to Northern Ireland but a transfer from the public to the private sector.

- The model assumes that the policy of reducing corporation tax in Northern Ireland to (12.5%) is pre-announced in 2012 followed by its introduction in 2014. This two year period would allow Invest NI, as the economic development agency, to promote the attraction of investing in Northern Ireland and also make the necessary changes to its support programmes.
- The announced reduction in the UK level of corporation tax (to 23% by 2014/15) has been taken into account in the model.
- Key aspects of the forecasting model used to produce the estimates contained in this report have been independently reviewed by Professor Rowthorn of Cambridge University.

### **Baseline Forecasts**

The baseline forecasts for the Northern Ireland economy (which assumes no policy change with regard to corporation tax, other than the UK announced changes) points to Northern Ireland continuing to lag behind the UK average with little or no convergence in living standards. The baseline forecast indicates that:

- It will be over a decade before employment returns to levels last seen in 2008.
- The relative standard of living (measured by GVA per head) will remain depressed, due to the weak employment rate, and there is no prospect of material convergence with the UK.
- Economic growth will lag behind the UK during the recovery and is expected to roughly track the UK performance in the longer term.
- Productivity is expected to improve only modestly compared to the UK, with a gap of more than 10% likely to persist.

## Summary of Outputs from the Corporation Tax Modelling

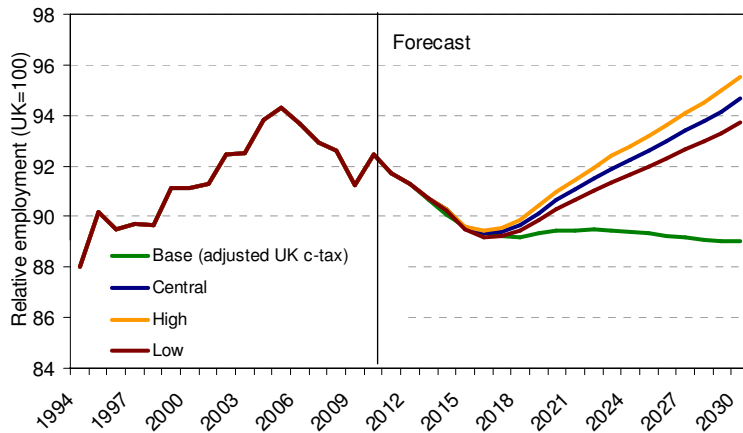
The economic model indicates that a reduction in corporation tax in Northern Ireland (to 12.5%) would have a significant impact on living standards and employment in Northern Ireland over the medium to longer-term.

The potential impact of Northern Ireland pre-announcing a reduction in corporation tax to 12.5% in 2012, and introducing the policy in 2014, (relative to the baseline of no deviation from the UK rate) is as follows:

- **Employment** is anticipated to be 58,000 higher by 2030, representing a 6.7% increase from the baseline. This represents an average of over 4,500 additional jobs per year in the longer-term, throughout the economy, peaking at almost 5,800 per annum by 2030.
- **Foreign Direct Investment** is forecast to comprise 42% of the net additional jobs.
- The **standard of living** in Northern Ireland, measured by GVA per capita, is forecast to be £24,500 per person, which is 13.5% higher than the baseline. This implies significant progress toward convergence with living standards in the rest of the UK.
- **Economic growth**, measured by average annual GVA, is forecast to be around one percentage point higher per year with the economy 13.8% larger by 2030.
- **Productivity**, as measured by GVA per worker, is forecast to be 6.6% higher than the baseline by 2030 (at £52,300 per worker).
- **Exporting** activity (as opposed to external sales, which comprises the totality of sales outside of Northern Ireland) is forecast to be 34% higher than the baseline, valued at £15 billion in 2030.

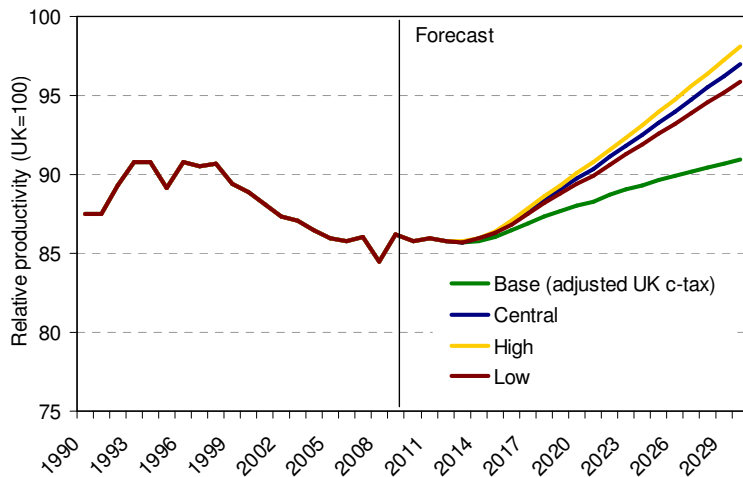
These trends are displayed graphically overleaf.

### Relative employment rate to UK, base, central, high and low scenarios



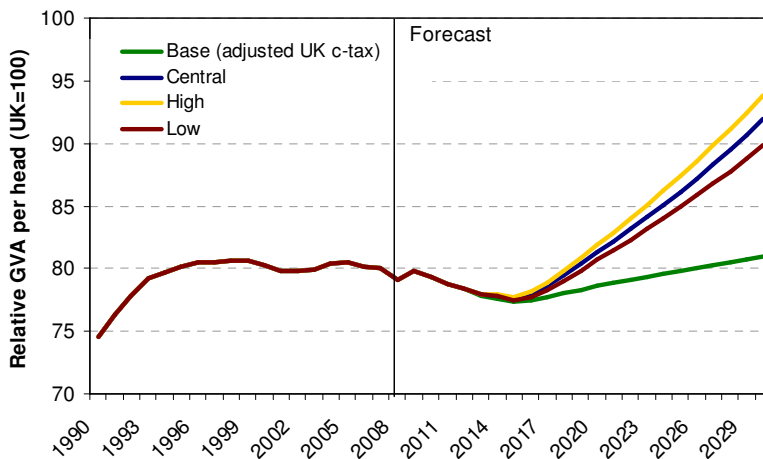
Source: Oxford Economics

### Relative productivity to UK, base, central, high and low scenarios



Source: Oxford Economics

### Relative GVA per head to UK, base, central, high and low scenarios



Source: Oxford Economics

In addition, as part of this work, the EAG was given access to emerging results from a separate but related research project on FDI flows<sup>5</sup>. The growth in FDI into Northern Ireland estimated as part of this corporation tax paper is broadly consistent with the emerging estimates from the ongoing DETI-led study. In short, both studies reached the conclusion that with a lower corporation tax rate, Northern Ireland will be placed on a different and much higher economic growth trajectory than would otherwise be the case.

## **Related Policy Issues**

The model indicates that the overarching result of a major reduction in the rate of corporation tax in Northern Ireland is that it is expected to induce economic convergence with the UK / and its other key competitor countries by creating a more private sector oriented economy.

The reduction in the Northern Ireland corporation tax rate would be expected to improve substantively the economic competitiveness of Northern Ireland as a region. This would also have wider implications for the economy such as creating employment opportunities to help reduce the 'brain-drain' from Northern Ireland; strengthen the economic position of many local companies via building supply chain linkages and wider trading relationships with larger multi-national companies and help address poverty across society by reducing joblessness and increasing employment incomes. The EAG is, of course, not alone in holding this view. For example the Northern Ireland Affairs Committee, in its recent report on corporation tax in Northern Ireland, stated that "we believe there is a convincing case for reducing the corporation tax rate in Northern Ireland"<sup>6</sup> in order to maximise the competitiveness of the local economy.

The model indicates that the net corporation tax receipts are expected to remain negative throughout the forecast period (up to 2030). However, when other tax yields (from sources such as income tax and national insurance contributions) are included then the policy is expected to break-even by 2021 on an Exchequer basis.

In light of the above, it is important that with the introduction of a reduced corporation tax rate in Northern Ireland, the Executive / Assembly is also able to retain the yields from other related taxes (e.g. income tax and national insurance contributions). These yields would be important as they would offset the reduction in the block grant after an initial period and could also aid in the rebalancing of the economy. Moreover, the positive impacts of this measure should not be diluted by the introduction of additional business costs (such as increasing business rates) that might be used to offset the short-term impact of the reduced block grant. This reflects the reality that many

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<sup>5</sup> Future Prospects for Improving the Quality of FDI to Northern Ireland (DETI research project, which is scheduled for publication later in 2011).

<sup>6</sup> <http://www.parliament.uk/business/committees/committees-a-z/commons-select/northern-ireland-affairs-committee/inquiries/corporation-tax-in-northern-ireland>

businesses in Northern Ireland continue to operate on the basis of cost and any changes to this could negatively impact on their operations.

The other scenarios (high and low) presented in this paper also result in a marked improvement in all of the key economic metrics. Therefore even with more modest assumptions around future FDI flows and local reinvestment, the overall economic impact remains strongly positive.

### **Evidence from Elsewhere**

The available evidence indicates that global growth in FDI stocks and flows is set to continue and remain a priority in the economic development plans of Governments around the world.

The experience within the RoI suggests that a low level of corporation tax is an important factor in its attraction of FDI. As section 5 illustrates, with the reduction in corporation tax rates, revenue continued to grow. Furthermore, during the recent and on-going budget process and negotiations with EU members, the RoI Government has made a very clear commitment to maintaining its low level of corporation tax, stressing its importance as a policy lever to stimulate growth in the economy.

In addition to the above, it should be recognised that even with the onset of the global recession, the RoI's Industrial Development Agency (IDA) has been able to sustain significant FDI job creation and the economy has maintained its position as a highly attractive destination for FDI.

Further afield, countries as diverse as Singapore and Estonia have shown the ability to attract greater levels of FDI inflows through a number of policy measures, including corporation tax incentives. This, in conjunction with the encouragement of a business-friendly environment, has led to very significant increases in the levels of output and employment.

This highlights that corporation tax is a very significant factor in attracting FDI, but it needs to be combined with other factors. For example, the Independent Review of Economic Policy (IREP) highlighted the need to address wider issues facing the local economy. The report recommended improvements in relation to R&D and Innovation, Skills, Infrastructure and Planning, and the EAG considers that these remain critical issues to encourage business growth. It should be noted that as part of the wider work of the EAG, further scenarios are being developed which will model the impact of increased R&D / Innovation support over and above what is detailed in this paper.

### **Conclusion**

This paper seeks to examine the impact of a reduced rate of corporation tax on the Northern Ireland economy. In particular, it seeks to assess the impact

the policy may have on helping to rebalance the economy by promoting greater private sector growth through the attraction of additional high valued-added, exported oriented, FDI, alongside improvements in the indigenous business base.

The findings of the paper are based on the OE model for the Northern Ireland economy and the conclusions drawn are based on contrasting the impact of a reduced rate of corporation tax on the Northern Ireland economy against a baseline which assumes a 'business-as-usual' scenario.

The key points from the analysis contained within the following chapters of this report are:

The **Baseline position** offers no prospect of living standards increasing to levels experienced in the UK as a whole.

**Lowering the rate of corporation tax** does offer the real prospect of Northern Ireland improving its medium to long term living standards and employment outcomes through attracting additional FDI, expanding domestic firms and seeing these effects feed through (via supply chains and spending power) to the rest of the economy.

The ability of the Northern Ireland Executive / Assembly to retain the **yield from other taxes** is likely to be a vital part of any strategy to help manage the public expenditure consequences and make the policy more affordable to the Northern Ireland Executive.

Notwithstanding the importance of corporation tax as a means of growing the private sector, it must not be viewed as a 'silver bullet'. For example, although the forecasts contained in this report illustrate how the measure should induce significant convergence to UK living standards, productivity and employment, they equally illustrate that the relative gap with the UK is not expected to fully close over the forecast period. Corporation tax is therefore a long term policy measure which is a necessary but not, by itself, sufficient economic development tool for the Northern Ireland Executive. It must be accompanied by the effective and timely deployment of an Economic Strategy that also prioritises investment in R&D / Innovation, Skills, Business Growth and Economic Infrastructure, alongside other additional measures to stimulate employment creation.

Finally, there are inevitable uncertainties in carrying out this kind of analysis, especially given the long-term view the EAG is investigating. Nevertheless, we are convinced that a reduction in corporation tax of the kind discussed here would bring major benefits to the Northern Ireland economy, benefits which other combinations of policies would be unlikely to achieve. Inevitably it would also imply a short-term fiscal cost but, while appreciable, we believe that ways could be found to manage this without putting significant downward pressure on Northern Ireland employment. In summary, a lower corporation

tax rate for Northern Ireland would place the economy on a much higher growth trajectory than would otherwise be the case.

## Context

### 1.1 Introduction

The purpose of this paper is to ensure that the EAG makes an informed and evidence-based response to the HM Treasury (HMT) consultation paper on rebalancing the Northern Ireland economy. The key aspect of the consultation paper is section 4, which outlines the potential costs and benefits of reducing corporation tax in Northern Ireland. Other options for economic reform are also covered more briefly in the consultation (e.g. enhanced R&D tax credits; capital allowances; training credits and national insurance holidays).

In light of the above, this paper centres on the issue of corporation tax and provides independent estimates of the potential impact on the Northern Ireland economy of a reduction in the rate to 12.5%.

The structure of the paper is as follows:

- The paper begins with an outline of the HMT consultation paper and the range of issues that have been identified for discussion (**section 1**)
- Forecasts are then provided on the expected development of the Northern Ireland economy over the short, medium and longer-term, initially with no additional policy stimulus (**section 2**). This provides a basis for comparison from which the various low tax scenarios are later assessed.
- The paper outlines the underpinning economic model (in terms of structure, data and assumptions) that has been created to estimate the impact of a reduction in the rate of corporation tax on the Northern Ireland economy over a specified time period (**section 3**).
- Given the uncertainties associated with forecasts of this nature, the output from the economic model is presented across three scenarios – central, high and low (**section 4**). The output includes projections on a range of costs and benefits, including the impact on economic growth, job creation and convergence to living standards elsewhere in the UK.
- In addition to the model-based scenarios, the paper includes analysis on current global trends in corporation tax rates and the stock/flow of FDI (**section 5**). The examples of the Republic of Ireland (RoI) and Estonia are also outlined as both countries have successfully deployed corporation tax as part of their wider economic strategies.

- Further detail on the various scenarios and the underpinning economic model are outlined in **Annex A**.

## 1.2 UK Government Paper on Rebalancing the Northern Ireland Economy

As set out in the UK Coalition's Programme for Government, and the June Budget 2010, the UK Government and the Northern Ireland Executive (NIE) have a common objective to rebalance the Northern Ireland economy, to increase the size of the private sector and drive faster economic growth.

The Programme for Government included a commitment to 'produce a government paper examining potential mechanisms for changing the corporation tax rate in Northern Ireland'. The June 2010 Budget provided further detail on the content of the Government paper, stating that it would include examining proposals for economic enterprise zones, possible mechanisms for changing the corporation tax rate and other economic reform options.

The consultation paper was published on 24 March 2011 and it sets out the current state of the Northern Ireland economy, including some of its strengths such as a relatively young population, high quality education system and competitive labour costs. Longstanding weaknesses are also highlighted such as low productivity, low employment rates and an under developed private sector, all of which present significant challenges for future economic growth. The substantive impact of the recession on the Northern Ireland economy, especially on the local labour market, is also highlighted.

The consultation paper outlines the Government's new economic approach to rebalancing the UK economy. It argues that the UK economy has become too reliant on growth from a limited number of sectors and regions. The Government's economic policy aim is to achieve strong, sustainable and balanced growth that is more evenly shared across the country and between industries. The Plan for Growth, published alongside Budget 2011, contains four ambitions to help achieve this economic objective. The four ambitions are:

- To create the most competitive tax system in the G20;
- To make the UK one of the best places in Europe to start, finance and grow a business;
- To encourage investment and exports as a route to a more balanced economy; and
- To create a more educated workforce that is the most flexible in Europe.

The consultation paper outlines some of the issues involved in devolving corporation tax to Northern Ireland and includes estimates of the expected

costs and benefits. Possible issues in implementing a separate corporation tax rate in Northern Ireland are also detailed. As indicated previously, other tax policies to help rebalance the economy are briefly considered, such as R&D tax credits, Enhanced Annual Investment Allowance (AIA), Training credits and National Insurance Holiday, as are a number of non-tax reforms.

The paper concludes that reducing the corporation tax rate in Northern Ireland would have a positive impact on both domestic investment and FDI, which could lead to increased economic growth and a stronger private sector. It also states that in order to meet the EU Azores criteria, the Northern Ireland Executive would have to meet the conditions of institutional, procedural and fiscal autonomy (and the paper states that it is expected that Northern Ireland would meet this criteria). This means that Northern Ireland would bear the full fiscal consequences of a reduction in the corporation tax rate. Critically, from an EAG perspective, this should not refer solely to reductions in the block grant but also the inclusion of other tax receipts that will increase as a result of this measure – in particular, income tax and National Insurance contributions. This important issue is highlighted, though not resolved, in the consultation paper.

The Government is seeking views on a number of issues relating to rebalancing the Northern Ireland economy, including:

- *Whether there is a need to rebalance the Northern Ireland economy by strengthening the private sector over the longer term and to increase economic growth and promote significant new investment;*
- *Where there is most scope for increasing productivity, reducing labour market inactivity and increasing growth;*

Views on devolving corporation tax rate varying powers to Northern Ireland. In particular, views on the following:

- *The importance of the headline corporation tax rate in encouraging investment;*
- *The extent to which a reduction in the rate of corporation tax in Northern Ireland could support additional investment, higher growth rates and increased employment in the Northern Ireland economy;*
- *The estimated costs arising from a lower corporation tax rate in Northern Ireland;*
- *The dynamic impacts on tax receipts arising from a lower corporation tax rate in Northern Ireland;*
- *The risks to the NIE arising from a devolved corporation tax rate in Northern Ireland;*
- *Potential compliance costs and administrative burdens for business arising from a devolved corporation tax rate in Northern Ireland;*
- *The approach that would be taken to adjust the block grant arising from a devolved corporation tax rate in Northern Ireland;*

- *The balance of potential costs and benefits of a reduced corporation tax rate in Northern Ireland;*
- *The merits of a deferred implementation of a rate reduction in Northern Ireland and its potential impact on investment decisions;*
- *The extent to which a phased reduction in the rate of corporation tax in Northern Ireland could support a rebalancing of the economy while allowing the costs of the reduction to be more effectively managed;*
- *The impact that restricting any reduction in corporation tax receipts to trading income only would have on the aim of rebalancing the Northern Ireland economy and the value for money of a corporation tax reduction;*
- *Whether there are other options to offset the cost to the NIE of a reduction in the rate of corporation tax that would be consistent with the overall aim of rebalancing the Northern Ireland economy; and*
- *The extent to which changes to R&D tax credits, annual investment allowances, training credits or a national insurance holiday could provide feasible, effective, affordable and value for money support for the rebalancing of the Northern Ireland economy.*

## 2 The Baseline Forecast

### Summary of Key findings

Current forecasts for the Northern Ireland Economy are:

- It will be over a decade before employment levels recover to their 2008 peak.
- The standard of living relative to the UK, measured by GVA per head, will remain depressed due to the weak employment rate.
- Economic growth, measured by GVA, will lag behind the UK during the recovery and roughly track the UK in the longer term.
- Productivity, measured by GVA per worker, is expected to improve modestly compared to the UK, although by 2030 a gap of more than 10% remains.

The continuation of the status quo offers no prospect for rebalancing the economy or matching UK living standards.

The baseline forecast assumes no policy changes. The outcome from changing the corporation tax rate to 12.5% is compared to this baseline scenario to measure the potential impact of reducing corporation tax.

### 2.1 Revised Oxford Economics Model

The results presented in this report are based upon a revised Oxford Economics baseline forecast for the Northern Ireland economy which takes account of a number of revisions to the published Oxford Economics forecast for Spring 2011. These changes are detailed in the table overleaf.

### The revised summer 2011 Oxford Economics Forecast

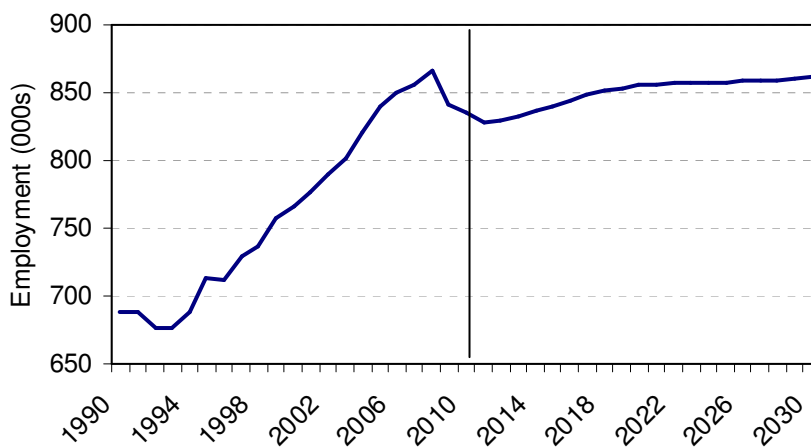
- **Change in UK Corporation tax:** The forecast model has been updated to include the announced reductions in UK corporation tax (prior to their incorporation in the full UK suite of models) to 23% by 2014.
- **Reduction in SFA spend:** No allowance for the potential end of SFA funding is built into the standard Oxford Economics model due to the ongoing uncertainty over precisely what will happen. In this revised baseline, two thirds (approx £40m) of SFA spend (averaged over the last five years of data supplied by InvestNI) has been removed from 2013, with the consequence of reducing jobs that would otherwise have been supported by InvestNI (see Annex A for more detail of the impact of this change).
- **Increase in R&D spend:** The monies assumed saved from SFA support (circa £40m) has been transferred into R&D spend. This has the effect of increasing productivity levels, and modestly increasing employment. The current data provided to support this modelling work includes spending on training and other forms of support – **to achieve the returns built into this revised baseline the spend must be directly on R&D / innovation. (See Annex A for further details).**

In total, the revised baseline is only modestly different in employment terms from the last published Oxford Economics figure (just over 3,000 jobs lower in 2030, and £2,995 million higher GVA).

## 2.2 The impact of the recession

After more than two decades of sustained growth, the global recession in 2008/09 had a severe impact on the Northern Ireland economy. The region also endured a reversal in the housing market which was more pronounced than elsewhere in the UK (though not as severe as in the neighbouring Republic of Ireland) and this further exacerbated the impact of the downturn. The economy has slipped back from its 2008 highs and the forecast suggests it will be over a decade before employment levels return to their peak.

**Figure 2.1: Employment forecast (Northern Ireland)**



Source: Oxford Economics revised summer 2011 baseline

The loss of 40,000 jobs has taken employment to back below 2005 levels and unemployment has returned to levels not experienced since 1995. The job losses have been spread across a range of sectors with construction suffering most severely, as have business services and retail. Some sectors have held up despite the recession, such as agriculture and public services, but in quarter 4, 2010 only 2 of the 14 main sectors in the economy were larger in employee job terms than in the corresponding quarter in 2007<sup>7</sup> (i.e. Health and Education, which are heavily reliant on public funding).

**Table 2.1: Employee job change by sector (Q42007-Q4 2010)**

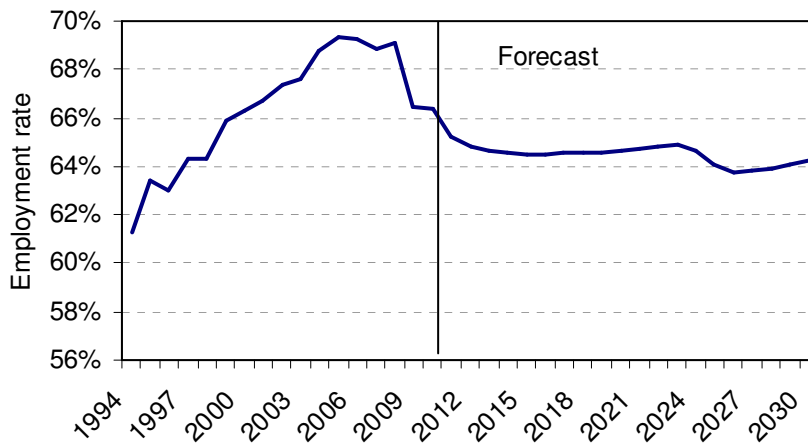
	Q4 2007 - Q4 2010
Agriculture	-300
Extraction	-500
Manufacturing	-9300
Utilities	-100
Construction	-14700
Distribution	-6900
Hotels	-1200
Transport & comms	-1300
Financial services	-600
Business services	-4300
Public admin & defence	-1000
Education	1900
Health	1000
Other personal services	0
<b>Total</b>	<b>-37300</b>

Source: DETI Quarterly Employment Survey

<sup>7</sup> The latest data records a loss of 32,000 jobs (4 quarter averages) between 2008 and 2010. The revised baseline forecasts a further loss of 7,000 jobs in 2011.

Employment rates have fallen by 4 percentage points and the forecast is for further modest falls before a levelling off, with no return to the levels enjoyed towards the end of the last decade.

**Figure 2.2: Employment rate (Northern Ireland)**

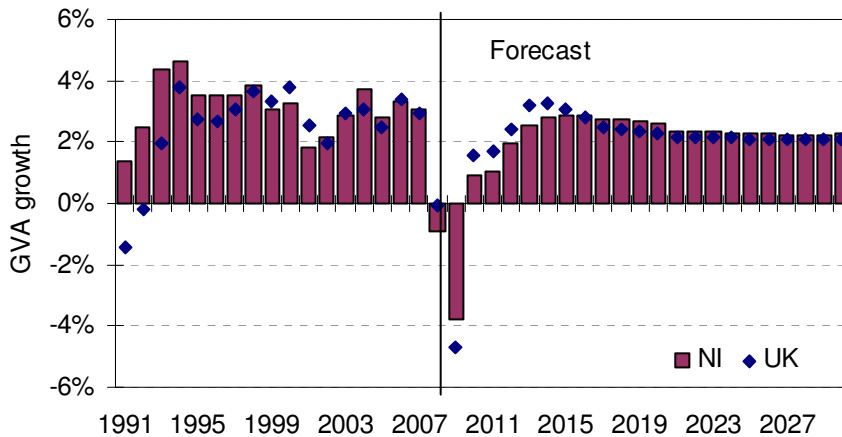


Source: Oxford Economics revised summer 2011 baseline

Note: The fall in 2024/2027 is due to the change in the retirement age

The latest regional GVA data for 2009, when deflated, suggests a slightly more modest contraction in Northern Ireland than in the UK as a whole, despite the much weaker labour market performance. Looking ahead, the forecast is for Northern Ireland’s economic growth to lag behind the UK during the recovery and roughly track the UK in the medium and longer term. This ability to match the UK rate of growth is achieved due to the returns from increased R&D spend built into the baseline (see **Annex A**, revised baseline). However, it is clear that current estimates in terms of labour market and economic growth do not anticipate any convergence with UK levels over the short, medium and longer-term.

**Figure 2.3: GVA (Northern Ireland and UK)**



Source: Oxford Economics revised summer 2011 baseline

Note: UK data relates to GDP, NI data is GVA

### 2.3 Risks and opportunities ahead

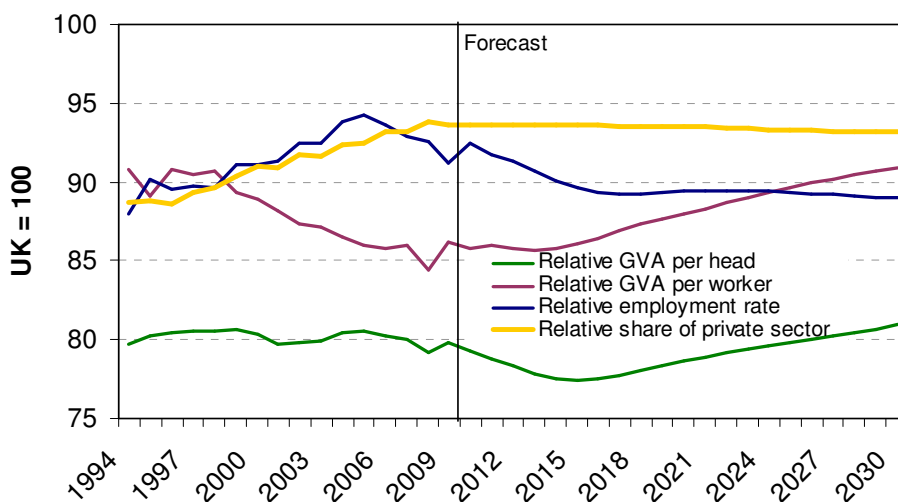
The forecast for Northern Ireland is one of only modest recovery followed by subdued growth. Within this challenging outlook there are some notable areas of strength, particularly in the export sectors. The key factors underpinning the forecast are set out below:

- **Public sector constraints:** Northern Ireland is more dependent on the public sector than elsewhere in the UK (in employment terms Wales and the North East are similar). There is a very significant tightening of public expenditure as part of the Coalition Government's deficit reduction plan. Arguably the settlement for Northern Ireland was relatively favourable, however, it still prevents any significant growth in public sector jobs over the short term. Coupled with reductions in procurement spend, there will be a dampening effect on growth due to fiscal constraint.
- **Consumer spending:** Consumer spending has held up relatively well during the recession but the next 12-24 months will be particularly challenging for consumers. Interest rate rises, modest wage growth and high price inflation will lead to falling real incomes and consequently pressure on the consumer dependent sections of the economy.
- **Export potential:** The strength of Northern Ireland exports has been favourable during 2010, buoyed by strong global demand, and the weak sterling exchange rate. The outlook for global demand remains favourable and this will continue to provide growth potential for the region's export base in manufacturing, agriculture and, to a lesser extent, professional services. The exchange rate is an important factor in this favourable outlook and is assumed to remain close to its current low level.

- **New sectors / new location:** Every economy is always in a state of flux, with new sectors and consumer trends emerging which present new opportunities. Alongside expected areas of growth such as green technology, advanced engineering, tradable services, care for the elderly, tourism and food technology, there will be other sectors which will emerge offering potential for growth. Demand from emerging nations is expected to remain strong and economies in Africa and Latin America will grow in importance, again presenting new opportunities.

## 2.4 Outlook for Key relativities

**Figure 2.4: Key performance metrics (NI, UK =100)**



Source: Oxford Economics revised summer 2011 baseline

Note: Public services includes elements of private provision, particularly in education and health

This outlook for Northern Ireland is one of sustained economic disadvantage relative to the UK average.

- Northern Ireland's employment rate is expected to fall back from its peak of 95% to just below 90% (note, UK = 100 and significant levels of out migration, as experienced in ROI, would improve this metric).
- GVA per worker (productivity), is expected to improve modestly as the impact of increased R&D spend begins to have an effect. Nevertheless convergence is very modest and, even by 2030, a gap of approximately 10 percentage points remains.
- GVA per head does not enjoy the same modest improvement as productivity, given the weak employment rate which keeps this measure depressed.
- The improvement in productivity is not a feature of Oxford Economics' own baseline forecasts and the impact of increased R&D spend is a crucial factor in this outlook (see **Annex A** for details).

These metrics clearly identify the need for a 'step change' to enable the long sought after convergence with UK averages and place Northern Ireland on a faster growth trajectory. Such convergence, over the longer term, would also allow the region to reduce its very heavy dependence on the UK Exchequer and increase the absolute standard of living.

### 3 The Corporation Tax Model

#### Summary of Key findings

The model works as follows:

- Additional FDI is attracted by a reduced corporation tax rate.
- Existing NI firms enjoy a tax windfall and reinvest a proportion to help create additional output and jobs.
- Jobs are assumed to be lost in the public sector to fund the tax reduction.
- Changes in income taxes, national insurance and rates have a positive impact on the NI Executive funding block.
- Changes to taxes from increased levels of incorporation and transfer pricing are included.
- The additional jobs and wages have indirect effects, through the supply chain and spending effects, which create further output and employment – referred to as the multiplier effects.

The model contains various assumptions, ranging from macro issues such as interest rates and oil prices, to specific corporation tax assumptions such as the level of incorporation.

Key aspects of the model have been reviewed and verified by Professor Rowthorn of Cambridge as part of an independent quality assurance exercise.

#### 3.1 The Model

The model used to assess the impact of the corporation tax reduction is based around the well established Oxford Economics model of UK regions. In use for nearly 30 years, the model has long been utilised by clients throughout the UK, including the Northern Ireland Executive, and is consistent with the Oxford Economics global and UK sectoral forecasts.

- To facilitate tax modelling, the regional model has been augmented with a specific tax model which incorporates basic taxation forecasts and a more detailed input/output matrix to model the supply chain effects of policy changes. This addition was originally developed for work carried out on behalf of ERINI and further developed by the Economic Reform Group (ERG).
- The model has been provided to Treasury for examination during initial discussions around corporation tax (the Varney report) and the results scrutinised by Northern Ireland departments and economists as various

iterations have been made over the years. The original model has been subject to a range of improvements in consultation with DETI and other stakeholders. The equations and key aspects utilised in the model have been independently reviewed and verified by Professor Rowthorn of Cambridge University.

- The model uses econometric results and evidence from other commissioned work, such as the DETI research projects into ‘Lessons from Peripheral Economies’ (referenced in section 5) and also worked carried out by Oxford Economics for the Economic Development Forum (EDF), the predecessor to the EAG.
- Any of the estimates / assumptions used in the model have been broadly in line with subsequent estimates published independently<sup>8</sup>. The impact of block grant reductions on public employment is based on the published Office of Budget Responsibility (OBR) estimates of the changes in UK Public Expenditure and its forecast reduction in general government employment.

The model is detailed in **Annex A** but, by way of summary, the model works as follows in response to a corporation tax reduction:

- Additional FDI flows are attracted by the reduced corporation tax rate (the rate of attraction of FDI in response to the tax rate is a key assumption – see below);
- Existing firms in Northern Ireland enjoy a tax windfall and re-invest some of this windfall creating additional output and jobs;
- The loss in corporation tax to the UK government from the reduction in the rate becomes a ‘cost’ to the Northern Ireland funding block and consequently jobs are assumed to be lost in the public sector to ‘pay’ for the reduction;
- Changes in income tax, national insurance and industrial rates are also calculated and, in the case of income tax and national insurance, are assumed to have an impact on ‘the block’ which again has employment implications (both negative in the short run and positive in the longer run);
- Changes to tax receipts due to increased levels of incorporation and transfer pricing are also included. These are taken from HM Treasury estimates;

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<sup>8</sup> For example, the projected growth in FDI into Northern Ireland is broadly consistent with the emerging estimates from an ongoing DETI-led study into FDI flows. This research "Future Prospects for Improving the Quality of FDI to Northern Ireland" will be completed end-Summer 2011, although emerging findings on corporation tax have been made available.

- All of the changes in jobs and wages (whether positive or negative) have indirect (supply chain) effects and spending effects (from the additional wages earned) creating further output and employment.

See **Annex A** for a more complete explanation of the model

### 3.2 The Data

The model uses official published data where possible, the key data sources are as follows:

- Population: NISRA
- Employment: DETI (Quarterly employment survey)
- Self Employment: DETI (LFS)
- GVA: Regional Accounts
- Tax estimates: Oxford Economics, benchmarked to Varney estimates for corporation tax and DFP financial estimates for other taxes.
- Estimates of transfer pricing, levels of incorporation: HM Treasury
- FDI forecasts: Data from fDi Intelligence and estimates from Oxford Economics (see **Annex A** for more details)

Care has been taken when compiling the modelling to ensure the relationships are not established using individual years of data, with particular care taken when using data drawn from the recessionary period. This is particularly important when considering the level of corporation tax paid in Northern Ireland, which will have fallen markedly in the recession, but would be expected to recover as the wider economy improves. Equally, relationships between economic variables and tax rates are all based on long run ratios removing any possibility of 'single year' bias. A similar approach is used when estimating the FDI flows and their sectoral composition.

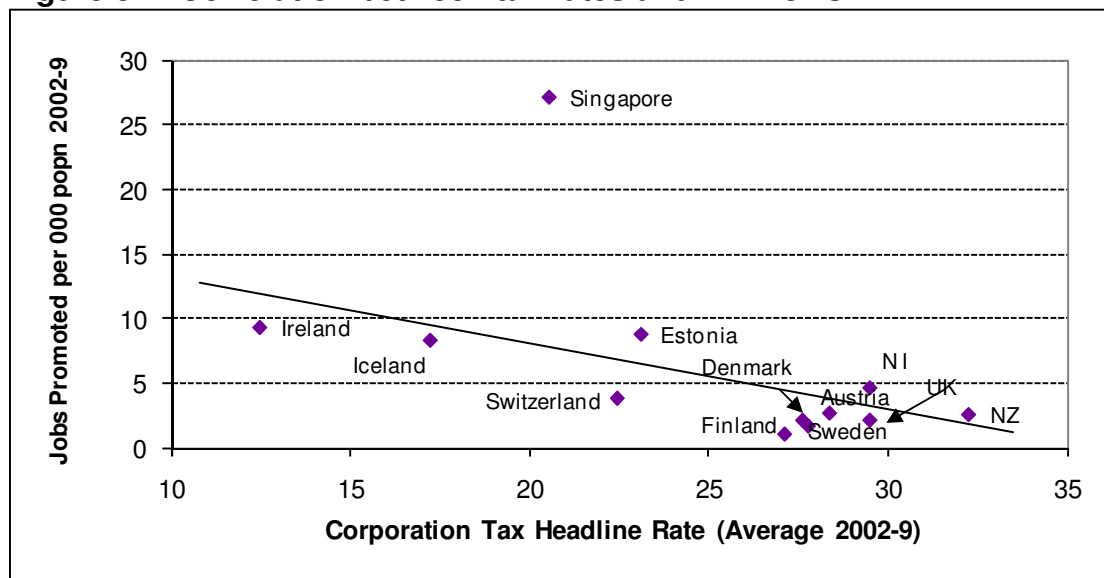
### 3.3 The Assumptions

The Oxford Economics tax model depends on a range of assumptions. The key assumptions critical to the final results are set out below (assumptions relating to constructing the revised baseline are set out in **Annex A**). In addition, it should be noted that the underlying Oxford Economics Spring 2011 baseline forecasts for the Northern Ireland economy are linked to the Oxford Economics national and global forecast models. These, in turn, depend on a range of assumptions about such things as the world oil price and the growth of world trade.

### FDI flows

Crucial to the overall impact of the corporation tax reduction is the level of FDI attracted in Northern Ireland (at varying rates of corporation tax). The forecasts are based upon econometric work carried out by Oxford Economics both to model corporation tax and as part of the DETI research programme 'Lessons from Peripheral Countries'. The core relationship is broadly illustrated below:

**Figure 3.1: Correlation between tax rates and FDI flows**



Source: Oxford Economics

The relationship is derived from fDi Intelligence data on FDI in export sectors into 12 countries. The data under analysis covers the years 2003-09 and includes 8,578 projects with an estimated 894,000 jobs promoted or an average of 128,000 per annum. The relationship is currently linear, as shown in Figure 3.1 above. Different (significantly more optimistic results) could be obtained using a semi-logarithmic equation, and (marginally less) from a linear equation omitting Singapore. The choice here is therefore a low estimation.

### Tax assumptions

Key to the overall 'cost of the investment' is the estimate of the tax implications of the policy change. Each of the taxes estimated is linked to a core economic variable in the model or, in the case of transfer pricing, taken from Treasury estimates. The various taxes are estimated as follows:

- Corporation Tax: Based on corporation tax estimates from businesses (existing and attracted in via the policy). The tax estimates are benchmarked to match Varney estimates of £550 million in 2007.

- Income Tax: Linked to total wages in the economy. The estimates of wages to income tax receipts is taken from the published UK data adjusted to reflect the relative wage differential. An average is taken over the last 5 years (16.4% of wages)
- National Insurance: This is estimated in an identical fashion to income tax. The average is 11.7% of wages.
- Industrial Rates income: This income is estimated and linked to GDP. The relationship is taken from published DFP data and the ratio is 3.1%.
- Benefit savings: This is a forecast based on an estimate of £3,120 per annum for people who were previously unemployed and £4,360 per annum for those on inactivity. These figures are for 2005, taken from DSD and are inflated at 2% per annum over the forecast period.
- VAT: This is estimated and is linked to overall GDP. The ratio is 7.9%.
- Additional public sector costs: These are costs associated with additional population that is attracted in response to the creation of additional jobs over the forecast period. The cost per job is estimated at £51K in 2012, in line with Office of Budget Responsibility estimates for the whole UK. This is forecast to rise at 2% per annum over the forecast period.
- Transfer pricing: Transfer pricing from the rest of the world into Northern Ireland is considered a net benefit to both the UK and Northern Ireland. Transfer pricing to Northern Ireland from the rest of the UK is a benefit to Northern Ireland but a cost to the UK and, as such, is assumed to be offset by an equivalent reduction in the size of the public expenditure block. The estimates for these flows are taken directly from the Treasury consultation paper.
- Operational and administrative costs: For now, this element has not been included as per the Treasury document. However, in this regard the EAG believe that the costs of administration should not be much above the overall costs that have been assumed as part of this analysis.

It should be noted that not all of the tax estimations listed above are incorporated to form part of the Block adjustment (see Table 4.4).

### ***Multipliers***

Multiplier effects are applied to the all of the direct impacts resulting from corporation tax changes within the model. Supply chain multipliers (these are

usually referred to as indirect, or Type 1 multipliers) are calculated using UK Input/Output tables. The consumer spending multipliers (usually referred to as induced multipliers or, when taken in tandem with indirect, as Type 2 multipliers) are calculated on the basis of the additional wages generated in the scenarios. These are then used to generate additional jobs in relation to consumer spending. In the central scenario the multiplier is approximately 1.6. This is consistent with published guidelines as to local multipliers.

### ***'Cost' of Reducing Corporation Tax rates***

At the point at which responsibility for corporation tax is transferred to Northern Ireland, it is assumed that a deduction will be made by the Treasury from the public expenditure block. This is to offset the value of corporation tax revenues which would have flowed to the UK Exchequer but in future will flow to the Northern Ireland Executive. In the model this initial cost is calculated by summing the estimated revenues from corporation tax and the Treasury's estimates of the net loss of revenues due to transfer pricing in addition to the loss to income tax from tax motivated incorporation. The estimates for corporation tax come from the model and costs for the other elements are taken from the Treasury documentation.

It is assumed in all scenarios that the Northern Ireland Executive will immediately reduce the rate of corporation tax to 12.5% in one step. The model then calculates the associated net loss in corporation tax revenues. As Northern Ireland must carry the 'full costs' of the policy it means that in subsequent years the changes in income tax and national insurance also 'feed back' onto the block allocation. In practice, this means additional losses in the short run (as public sector cuts, associated with a reduced PE block are amplified by multiplier effects, which themselves produce less tax). In the longer run there is a tax benefit as corporation tax, income tax, national insurance contributions and VAT revenues all rise, relative to the policy neutral case, as output and jobs are created as a result of increased levels of investment.

The initial loss of tax revenues in Northern Ireland are assumed to fall wholly on the public sector leading to reduced public sector jobs. Later, when there are net tax 'benefits', these are split between the public sector (50%), the construction sector (25%) and consumers (25%).

In order to provide a scenario that is capable of being modelled, the impacts on public expenditure were assumed to translate into reductions of public sector employment - with each £51,000 reduction inducing the loss of one public sector job (this was broadly in line with estimates from the Office of Budget Responsibility). However, it has been demonstrated in the past that very significant public expenditure pressures can be absorbed without obvious impacts on public sector employment. For example, during the 2008-11 budget period the Executive published revised 2010-11 spending plans which

absorbed an overall public expenditure pressure of £367 million. The main pressures were as a result of the cost of water and sewerage provision, the cost of the equal pay settlement and a reduction in capital receipts. The Executive reprioritised budget allocations between departments and delayed capital projects and yet over the 2008-11 Budget period public sector employment increased marginally by 1.6%<sup>9</sup>.

What is clear from the above is that there is a need for cost absorption to implement a reduction in the corporation tax rate and that there will be specific impacts depending on how this process is administered. However, it would be important that the positive impacts of the measure on the private sector were not diluted by the introduction of additional business costs (such as increasing business rates) that may be used to offset the short-term impact of the reduced block grant.

### 3.4 Differences between ERG & EAG Model

The corporation tax model used as the basis of this report is based upon work originally developed for an ERINI project for DETI. It was further developed by the ERG (Economic Reform Group) and results were published in the report 'The case for reduced corporation tax in NI'. Changes to the model since this time include:

- **The baseline forecasts for NI have been adjusted** to take account of the reductions in UK corporation tax to 23% by 2014/15.
- **The assumed reduction in corporation tax** in the scenarios is now from 24% in 2013 and 23% in 2014 to 12.5% thereafter.
- **Introduction of the policy:** this has been changed to reflect a proposed pre-announcement at 2012 before implementation at 2014 with the policy in full-effect from 2015. This allows Invest NI to promote Northern Ireland as a destination for value added FDI and also make the necessary changes to its own support programmes. Of course, the policy could be introduced in a number of different ways, including a phased process.
- **Adjusted economy baseline:** the economic conditions have changed markedly since the ERG report was published and the baseline forecasts have been adjusted accordingly.
- **Adjustment to Invest NI spend:** Given recent and further potential changes to regional aid thresholds, spending on Selective Financial Assistance (a major Invest NI programme aimed at supporting

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<sup>9</sup> Based on QES Q4 2007 compared to Q4 2010 and includes NI Central Government, Bodies Under Aegis of NI Central Government, UK Central Government, Local Government and Public Corporations

investment and related projects to increase business productivity in Northern Ireland) is assumed to have been reduced to one third of its current level and the spending transferred into R&D / Innovation.

- **Multiplier effects:** These have been improved to use official Input/Output multipliers as opposed to the more basic private services multipliers used previously.
- **Tax benefits:** The tax model has been updated and improved during the EAG research project.
- **Additional costs of implementation added:** This includes allowances for transfer pricing and incorporation due to the tax change. These are linked to Treasury estimates.

## 4 Outputs

### Summary of key findings

This paper provides independent estimates of the likely impact on the Northern Ireland economy of a reduction in its corporation tax rate to 12.5%. It is complex to estimate as there are a number of uncertainties. As a result a number of options are included which fan out from a central scenario (most likely outcome) through to high and low scenarios. The impact of reducing corporation tax in Northern Ireland to 12.5% (relative to the baseline of no change) is as follows:

- **Employment** is anticipated to be 58,000 higher by 2030, representing a 6.7% increase from the baseline. This includes an average of over 4,500 additional jobs per year in the longer-term (2020-2030), peaking at almost 5,800 per annum by 2030. Cumulative job creation from the policy turns positive in 2017 and the public sector becomes a creator of jobs from 2018.
- **Foreign Direct Investment** comprises 42% of the net additional jobs
- The **standard of living** in Northern Ireland, measured by GVA per capita, is forecast to be £24,500 per person, which is 13.5% higher than the baseline.
- **Economic growth**, on average, is forecast to be 1 percentage point higher per year, with the economy 13.8% larger by 2030.
- **Productivity**, as measured by GVA per worker, is forecast to be 6.6% higher than the baseline by 2030 (at £52,300 per worker).
- **Exporting** (external to UK) activity from businesses located in Northern Ireland is forecast to be 34% higher than the baseline, valued at £15 billion in 2030.

This induces a process of convergence with the rest of the UK rather than the baseline forecast which has NI continuing to lag behind the UK. In addition, there is a significant move towards a more private sector oriented economy in NI.

Net corporation tax receipts are negative throughout the forecast period (up to 2030) but break even in 2035. However, when all taxes are included the break even point is in 2021, and if only income tax, national insurance and business rate are included the break even is in 2023.

The NI Executive should prioritise discussions over the retention of the extra yield on other taxes as a result of this measure. The high and low scenarios also result in a marked improvement in all of the key metrics. Therefore, even with modest assumptions around future FDI flows and local reinvestment, the overall economic impact is positive.

The results suggest attracting a large proportion of the growing amount of FDI would make a material and lasting structural change to the economy.

## 4.1 Scenario assumptions

This chapter concentrates on the central estimates of the likely impact on the Northern Ireland economy of a reduction in the corporation rate to 12.5%. The economic impacts of reducing corporation tax in Northern Ireland are then drawn out by contrasting this scenario with the base-case (where no such tax stimulus is implemented).

In addition, by way of sensitivity analysis, two further scenarios have been run using the corporation tax model. In particular, lower and higher FDI inflow scenarios have been run. In the case of the higher scenario this is modelled to mimic a performance closer to the experience in Singapore, which stands out as the strongest performing country in the corporation tax analysis. This has the effect of increasing the FDI flows by approximately 20%. The lower scenario is the opposite of this effect, 20% less. The detail on these two further can be found in **Annex A**.

## 4.2 Central Scenario: Economic Implications

The headline results from the modelling central scenario, compared to the base-case, are set out in Table 4.1 below. The central scenario projects material increases in both economic growth rates and job creation over the forecast period. The improvement also increases over time, with the growth rate and job creation continuing to expand in the decade 2020-2030.

**Table 4.1: Average jobs and GVA growth, central scenario & base case, 2010-20 and 2020-30**

	Base		Central	
	2010-20	2020-30	2010-20	2020-30
Average annual job growth	2110	610	3270	5270
Average annual GVA growth (%)	2.5	2.3	2.8	3.3

Source: Oxford Economics

In relation to the long term growth rate, this is forecast to increase to around one percentage point per annum above an outcome in which corporation tax remains unchanged. By 2030 the economy would be 13.8% larger than would be under the base case. Job growth is also forecast to increase substantially, to over 5,200 per annum (during 2020-2030) compared to just over 600 per annum in the base case.

**Table 4.2: Annual jobs impact, central scenario**

	2010	2015	2016	2017	2018	2019	2020	2025	2030
New FDI	0	920	1220	1250	1270	1311	1343	1577	1910
Existing firms	0	372	514	534	551	568	586	673	765
Indirect & induced	0	-486	-625	422	1013	1255	1345	1763	2397

Source: Oxford Economics

**Table 4.3: Cumulative jobs impact, central scenario**

	2010	2015	2016	2017	2018	2019	2020	2025	2030
New FDI	0	1840	3060	4310	5580	6891	8234	15612	24455
Existing firms	0	728	1242	1776	2327	2895	3482	6674	10311
Indirect & induced	0	19	-607	-185	829	2084	3429	11225	21718

Source: Oxford Economics

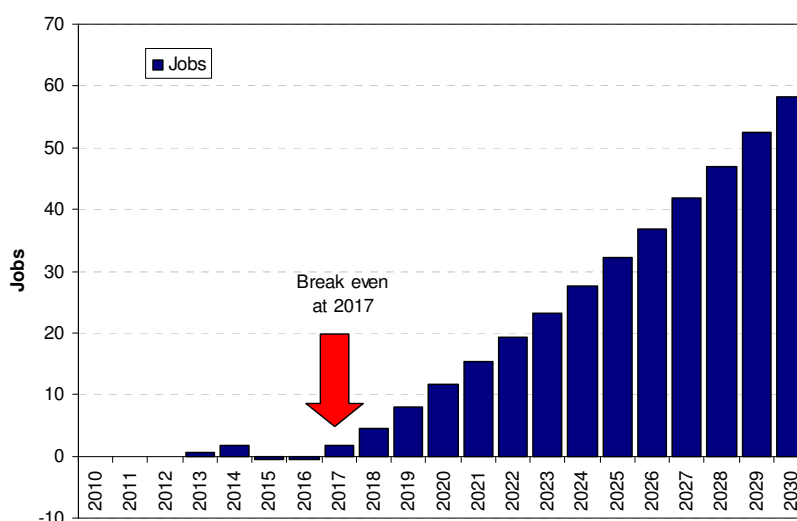
Notes: Public sector employment is assumed to reduce in the initial years due to the estimated cost of the policy. However, the public sector is forecast to begin creating jobs again from 2018 and for the remainder of the forecast period. For this reason, totals from the tables may not sum to those referenced in the text.

The increase in employment is more modest in the 2010-2020 decade as the FDI flows take some time to reach full potential (and the long run forecast is for an increase in FDI globally).

Equally, in the early years of the policy, there are public sector job losses factored in as part of funding the investment. Annual public sector job figures are expected to stay negative until 2018, before growth returns. However, caution needs to be applied to this assumption given the wide range of options that could be explored to reduce the impact on public sector employment. Indeed, if measures were taken to fund the investment from other means than public sector job losses, then the overall job creation figures could be improved.

Cumulatively, the net job impact becomes very slightly negative in 2015 and 2016 before returning to a positive impact in 2017 and accelerating throughout the forecast period. Over 58,000 net additional jobs are forecast to be created by 2030.

**Figure 4.1: Net Employment (cumulative), central scenario**



Source: Oxford Economics

The net change in jobs is made up of a range of components and, by way of summary, these are as follows:

- **New FDI jobs:** These are the new Greenfield jobs attracted into Northern Ireland as a result of the change to corporation tax. It is estimated based on the econometric analysis (see assumptions section earlier for discussion)
- **Existing firms:** These are expansions to existing firms in response to the tax change. They may be foreign or locally owned. The forecast is based upon assumptions regarding reinvestment of the windfall profits.
- **Indirect and induced:** These jobs are those created through the purchases from new jobs and by the spending of the additional wages generated by these jobs. There are also indirect and induced effects on any job losses in the early phase of the policy. These effects are often referred to as multiplier effects.

It should be noted that the forecasts also reflect that public jobs are initially reduced (and in the longer term potentially increased) following the adjustment to the block grant in fulfilment of the Azores criteria. The forecast is based upon the expected change in the Block (see below for discussion on applicable taxes) and translated, using OBR figures, into job changes. However, it is worth noting that in reality there may be other methods to absorb the short term cost rather than through public sector jobs loss. In the past some very substantial spending pressures have been addressed without recourse to widespread reductions in public sector employment.

In the long run, new FDI jobs equate to around 42% of the annual net additional jobs, existing firms 17%, public sector 3% and indirect / induced 37%. The total number of new jobs forecast by 2030 is just over 58,000.

The longer term impact on the labour market of reducing corporation tax is striking. However, it also helps to put the scale of the recession into perspective, as even under this policy, it is 2020 before Northern Ireland will have as many jobs as it did in 2008.

#### 4.3 Central Scenario: Tax implications

Central to the analysis of the overall impact of the change to corporation tax is the 'cost of the investment' and the long term returns that this investment may yield. On top of the obvious employment impacts from changes in FDI flows, and investment by existing firms already in Northern Ireland, there is the impact upon the levels of public sector funding that the region has at its disposal.

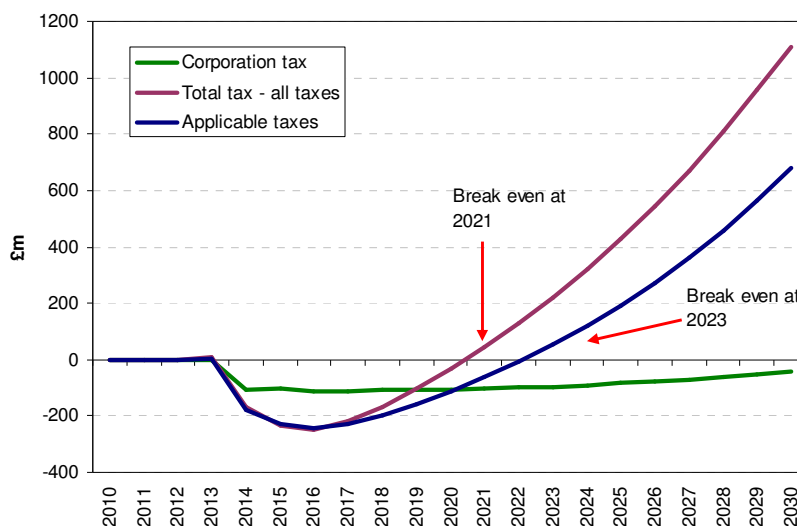
European Law states that any region making a taxation change (in addition to other criteria) must 'carry the full consequences of the change'. When considering this aspect of the ruling, debate has centred around the short term 'cost' that this would have and very little has said about the potential future increases in tax revenues that may occur. The corporation tax model sets out the tax implications of the forecasts and 'feeds' back the impact of cuts or

increases in public expenditure into the economy. The central scenario assumes that the public sector bears the full cost of the policy implementation (through reduced job levels) and when there are increases to the public sector budget, half of this is passed to the private sector and half is retained within public expenditure. This is in keeping with the aim of ‘re-balancing’ the economy towards greater private sector activity.

It remains unclear how any adjustment to Northern Ireland’s public finance ‘block’ would be made, given the complexity in gathering data on various tax returns at a regional level. As such, an assumption has been made that the implications of changes to income tax and national insurance would be included but changes to levels of benefit payments or VAT would not. In addition, local rates income is included as it is already an entirely local matter. Transfer pricing is included at the levels estimated by Treasury and additional public sector costs resulting from additional population are estimated but not included in the ‘tax implication’ calculation.

In overall terms net tax turns positive by 2021 (at a UK exchequer level) and applicable taxes turn positive by 2023. In the longer run, total tax returns outstrip the applicable taxes as the longer term benefits on VAT and, in particular, benefit savings as job growth accelerates, are not included in the applicable calculation. Corporation tax returns remain lower than the base case throughout the forecast, though by 2035 they would be projected to be positive. Further information on the projected level of corporation tax receipts is detailed in **Annex A**.

**Figure 4.2: Net Tax, central scenario**



Source: Oxford Economics

In tax terms, the overall impact by 2030 is an increase of just over £1bn of net tax revenue in 2006 prices. Of this, an additional £680m (2006 prices) would be applicable for additional spend by the NI Executive if a suitable funding mechanism were in place to record the change and for Northern Ireland to

capture the benefit of the additional yields on Income Tax and National Insurance Contributions.

**Table 4.4: Tax implications, central scenario (£m, 2006 prices)**

	2015	2016	2020	2030
Corporation tax	-104	-110	-106	-40
Income tax	-54	-67	-11	331
Rates	2	5	35	180
National Insurance	-13	-15	27	264
VAT	0	-1	11	82
Benefit savings	-3	-3	68	386
Profit shifting from GB	-60	-56	-56	-56
Additional public sector costs	0	0	0	-36
Total - all taxes	-232	-246	-32	1112
Total - applicable taxes	-229	-242	-111	680

Source: Oxford Economics

Note: Applicable taxes are those which would have an impact on the 'block'. They are shaded in the table. Profit-shifting is taken from the HMT paper Table 4.C with a reduction of 20% applied due to allowance for the assumption that reductions to corporation tax would apply only to trading profits.

#### 4.4 Central Scenario: Summary

In summary, the central scenario indicates a favourable return on the investment of a lower corporation tax rate. Employment, GVA and exports<sup>10</sup> are all materially higher than the baseline. The economy is demonstrably moving towards a more private sector orientated economy (the private sector's share of GVA is over two percentage points higher by 2030).

**Table 4.5: Summary of key metrics, central scenario differences from base**

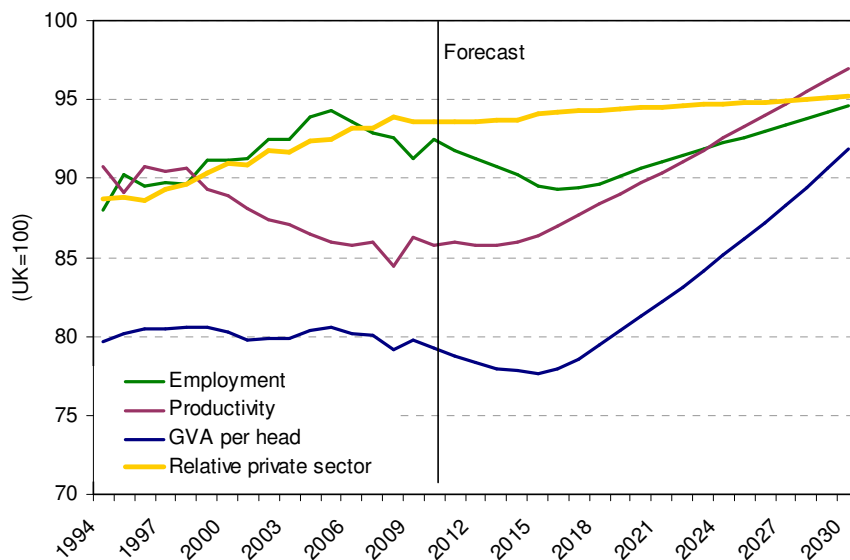
	2020 (Dif from base)	2020 (% dif from base)	2030 (Dif from base)	2030 (% dif from base)
Population (000's)	0	0.0	5	0.3
Jobs (000's)	12	1.4	58	6.7
Inactive (000s)	-7	-2.0	-31	-8.8
Unemployment (000's)	-3	-5.4	-15	-24.7
GVA (£m 2006)	1130	3.3	5858	13.8
Exports (£m 2006)	972	10.3	3812	34.1
Private sector employment (000s / pp)	15	0.8	55	1.5
Private sector GVA (£m 2006 / pp)	1272	1.1	5736	2.1
Total applicable taxes (£2006 prices)	-111	-	680	-
Total taxes (£2006 prices)	-32	-	1112	-

Source: Oxford Economics

<sup>10</sup> Exports are assumed to be exports outside the United Kingdom and not merely external sales from Northern Ireland.

All of the key relativities show a marked improvement, with trends converging on the UK averages - a pattern strikingly missing from the baseline forecasts. The scenario points to the ability, over the longer term, to rebalance towards private sector growth, with expanding exports and living standards that begin to compare with those in other parts of the UK. In addition, the Executive would, assuming it can retain the net improvement on income tax and national insurance, have a materially larger budget to spend, or the opportunity to reduce other devolved taxes and charges in the longer term, through additional revenues generated from a growing private sector.

**Figure 4.3: Key relativities under central scenario**



Source: Oxford Economics

The short term implications of a reduction in the block grant do, however, present an implementation challenge that needs careful consideration. Exploring ways to absorb the cost and also to mitigate costs such as transfer pricing and those associated with additional incorporation should be explored carefully and in detail.

#### 4.5 Alternative scenarios

Alternative scenarios have been run to test the sensitivity of the model to alternate forecasts of future FDI flows. The model is capable of testing variations of other assumptions but the results below focus on changes to the FDI outlook. Further details on the scenarios and tables of the results produced are presented in **Annex A**.

In total jobs terms, the level differs by just over 20,000 jobs between the low and high scenarios. GVA differs by just over £2.2bn (2006 prices).

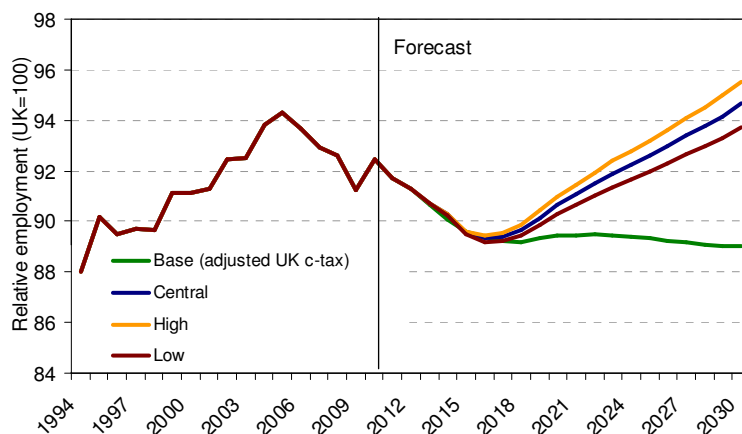
**Table 4.6: Summary of jobs and GVA impact in 2030, central, high and low scenario**

	Jobs (000s)	GVA (£m, 2006)
Central	58.2	5858
High	69.0	6978
Low	47.5	4743

Source: Oxford Economics

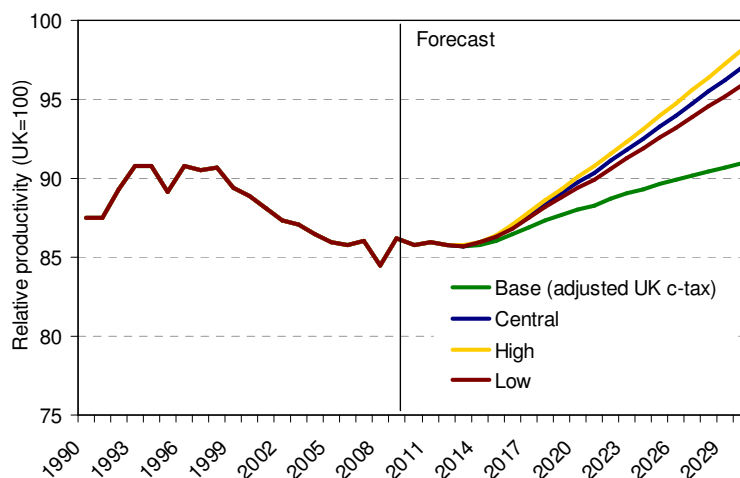
In overall terms, all three scenarios show a marked improvement in the key relativities. This suggests that even with cautious assumptions around future FDI flows and local re-investment, the overall economic impact remains positive. It is worth remarking that while the early years of the policy are less positive for the Northern Ireland labour market, it is the long term trajectory of growth that is fundamentally altered as a result of the policy.

**Figure 4.4: Relative employment rate, base, central, high and low scenarios**



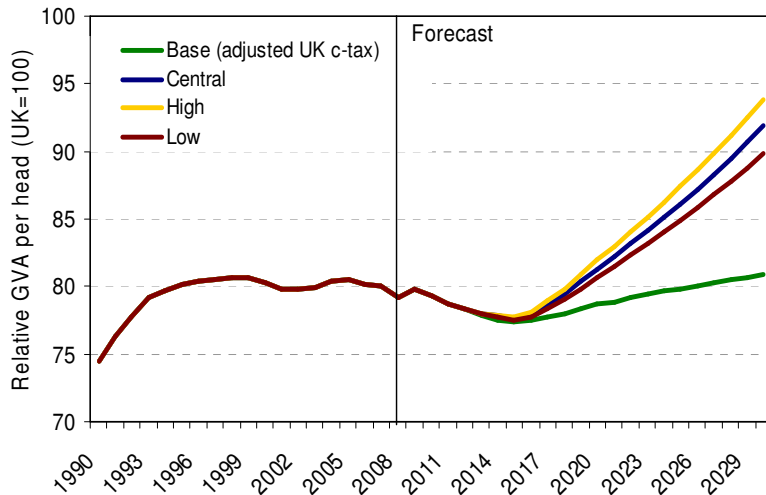
Source: Oxford Economics

**Figure 4.5: Relative productivity, base, central, high and low scenarios**



Source: Oxford Economics

**Figure 4.6: Relative GVA per head, base, central, high and low scenarios**



Source: Oxford Economics

The forecast charts suggest a very positive return on the investment in a lower corporation tax scenario. They are dependent on the estimated FDI flows materialising and an effective method of monitoring the impact on other taxes (most notably employment taxes) for the forecast to be realised. Although it is difficult to be precise about the future market for FDI, it is very unlikely that a growing world economy will not have significant mobile investment seeking a favourable location.

The expected performance of Northern Ireland in terms of these key relativities, when compared to the UK average, is detailed in the tables below. Across all of the metrics, Northern Ireland is expected to exhibit a marked improvement when compared to the base case and close the gap with average UK growth levels, with percentage point improvements across all scenarios. It would also improve the rate of growth, the level of exports, employment rates and help reduce Northern Ireland’s historic dependence upon the public sector and the UK Treasury.

**Table 4.7: Key Relativities in NI (UK=100), 2010 and 2030**

	2010	2030			
		Base	Central	High	Low
Relative employment rate	92.5	89.0	94.6	95.5	93.7
Relative productivity	85.8	90.9	97.0	98.1	95.8
Relative GVA per head	79.3	80.9	91.9	93.8	89.9
Relative private sector	93.6	93.2	95.2	95.3	95.0

Source: Oxford Economics

Notes: ‘Relative private sector’ relates to share of employment relative to the UK average

**Table 4.8: PP change in Key Relativities in NI (UK=100), 2010 and 2030**

	2010	Base 2030	2030 (pp diff from base)		
			Central	High	Low
Relative employment rate	92.5	89.0	5.6	6.5	4.7
Relative productivity	85.8	90.9	6.0	7.1	4.9
Relative GVA per head	79.3	80.9	11.0	12.9	9.0
Relative private sector	93.6	93.2	2.0	2.1	1.8

*Source: Oxford Economics*

## 5 Evidence from Elsewhere

### Summary of Key Findings

The global trend in corporation tax levels has been one of decline – OECD average corporation tax rates over the last 30 years have declined by around 20%.

The level of global FDI stock and flows has increased dramatically over the last 30 years and has become a much sought after commodity in the economic development goals of Governments.

While a range of issues are thought to influence the location of firms, it is very clear corporation tax is a significant factor in attracting FDI (which is supported by economic research).

The growth rate in the Republic of Ireland in terms of GDP and corporation tax receipts is highly correlated over the last 30 years, despite staged reductions in the rate of corporation tax.

Even with the onset of the global recession and its impact on the Republic of Ireland, the IDA has been able to re-establish FDI job creation and the economy as a whole has been able to maintain its position as a highly attractive destination for FDI.

Estonia has shown the ability to encourage greater levels of FDI inflows through a number of policy measures, including corporation tax incentives. This attraction of FDI, in conjunction with the encouragement of a business-friendly environment, has led to increasing levels of GDP over the last two decades.

#### 5.1 Global Trends

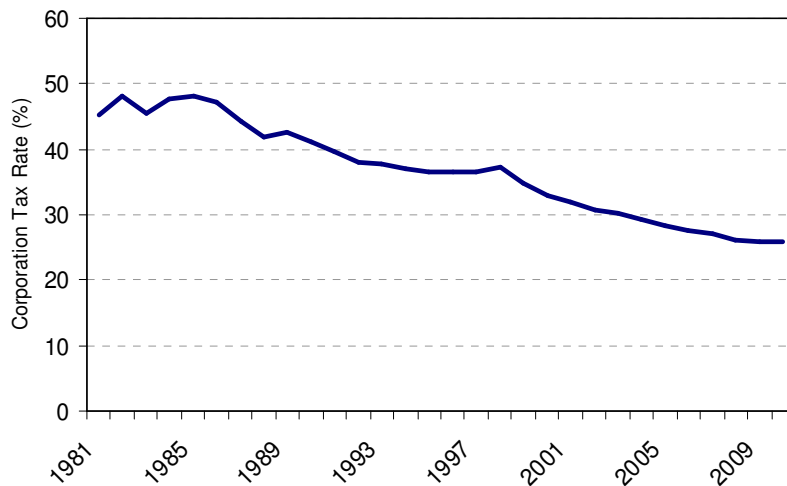
##### **Corporation Tax Rates**

This section highlights the global trends in corporation tax and FDI levels to provide an indication of the business tax environment and the potential for FDI attraction in the global market.

Data from the Organisation for Economic Co-operation and Development (OECD) illustrates that there has been a long term trend in countries reducing corporation tax rates. Figure 5.1 demonstrates that there has been a consistent decline in OECD corporation tax rates over the last 30 years with rates averaging 45% in 1981 and falling to 26% by 2010. This trend is also continuing, with some countries making further reductions in their corporate

tax rates, most notably the United Kingdom<sup>11</sup>. The EAG also recognises the importance of effective tax rates as part of embedding FDI, although comparable data is less accessible than it is for the headline rates that are presented below.

**Figure 5.1: OECD Corporation Tax Rate Trend – 1981-2010**



Source: OECD Data

## Foreign Direct Investment

Governments are continually aiming to improve the attractiveness of their country as a place to do business. They aim to strengthen the attraction and retention of mobile businesses and to promote the development of indigenous enterprise, in an effort to improve economic growth and prosperity. It is for these reasons that FDI has become increasingly important as the increasing flow of FDI in the global economy demonstrates (Fig 5.2).

Global trends in FDI flows have changed dramatically over the last 40 years, with a move from minimal levels of FDI in the 1970/80s to a dramatic increase in the 1990s. This growth has also seen two dramatic spikes in activity, with the most recent coming immediately before the onset of the global recession.

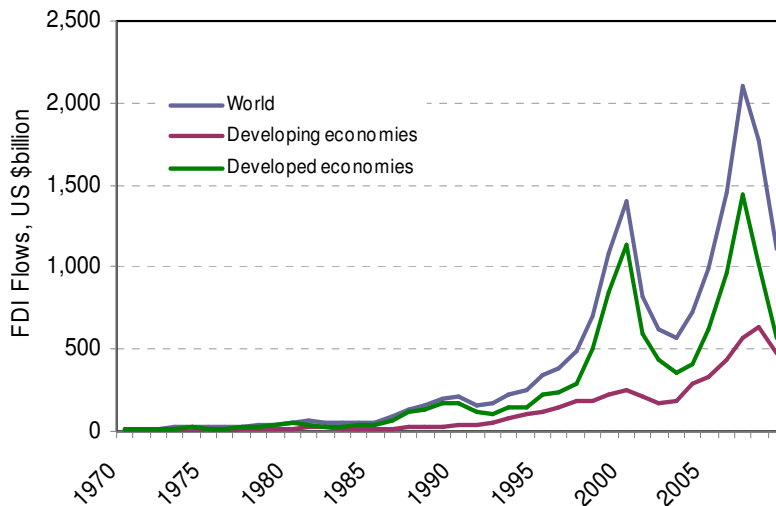
Figure 5.2 provides an indication of the increasing intensity of FDI flows in the global economy, with the decline in flows since the onset of the recent recession particularly evident. In their World Investment Report 2010, the United Nations Congress of Trade and Development<sup>12</sup> (UNCTAD) estimate

<sup>11</sup> In 2011, the UK Government announced a corporate tax reduction from 28% to 23% over the next four years. Finland has also proposed reducing the rate from 26% to 22%, with Canada also reducing their combined rate from 34% in 2007 to 27.6 in 2011 with a further reduction due in 2012.

<sup>12</sup> [http://www.unctad.org/en/docs/wir2010ch1\\_en.pdf](http://www.unctad.org/en/docs/wir2010ch1_en.pdf)

World FDI flows peaked in 2007 at \$2,100bn. UNCTAD also estimate that global FDI flows bottomed out in the latter half of 2009, a year which witnessed a fall in global FDI inflows of 37% and a reduction in outflows of 43%. UNCTAD, however, highlights that FDI flows made a modest recovery in the first half of 2010.

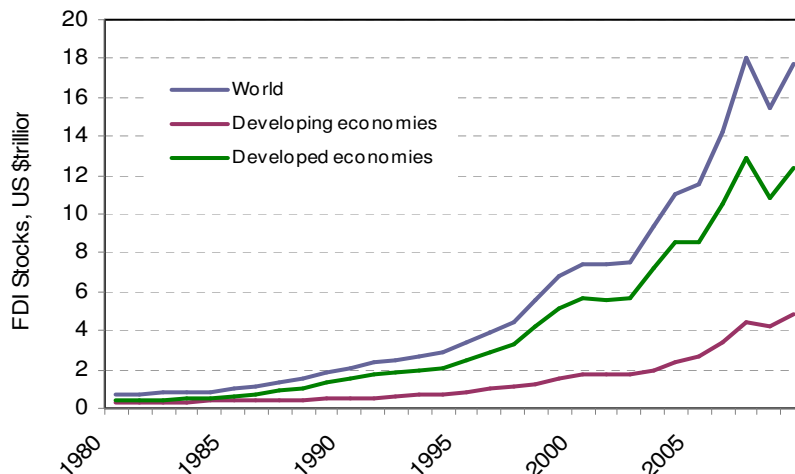
**Figure 5.2 – Global FDI Flows**



Source: UNCTAD

The culmination of these increasing flows in FDI activity can be seen in the global stock of FDI which is represented in Figure 5.3 below. This shows the increasing importance of FDI in the global economy and outlines its importance to both developed and developing economies. UNCTAD estimate that FDI stocks peaked in 2007 at \$18 trillion and by 2009 had recovered to \$17.7 trillion. UNCTAD also expect the modest recovery in 2010 to continue with global inflows expected to pick up to over \$1.2 trillion by the end of 2010, rising further to \$1.3-1.5 trillion in 2011 and \$1.6-2 trillion in 2012.

**Figure 5.3 Global FDI Stock**



Source: UNCTAD

## 5.2 DETI Research

The Department of Enterprise, Trade and Investment, through its Research Agenda 2008-11, has taken forward a number of research projects<sup>13 14</sup> which sought to analyse successful small open economies around the world and consider the factors that contributed to their success. The research will be published shortly, but the EAG were given access to the emerging findings, particularly in relation to the effects of FDI and corporation tax on the economic development of a small economy.

The research highlights two successful approaches to economic development:

1. **Innovation and R&D:** This is a long-term strategy which depends critically on building up substantial R&D capacity in export companies. It requires significant investment in institutions to increase research capacity (such as universities and research organisations) as well as a very strong education system to ensure an appropriate supply of skilled labour; and
2. **Foreign Direct Investment:** This strategy ‘imports’ multi-national companies on the basis that they are generally more productive, export-intensive and R&D orientated than indigenous companies. Benefits from this approach are shown to be realised over the short, medium and long term.

The second approach outlined in the research is most relevant for this paper. Three small economies were found to have exceptionally high (per capita) performance in attracting FDI – Singapore, Republic of Ireland (RoI) and Estonia. These economies, in particular Singapore and the RoI, have experienced rapid growth in living standards and productivity through the attraction of high value multi-national companies (although, as detailed later in the report both the RoI and Estonia have sustained significant contraction during the recent global recession).

The available evidence suggests that countries with weak export sectors and relatively low productivity use a **low rate of corporation tax** to attract internationally-competitive high value companies. This is deemed to be the most effective approach for small economies to attract high levels of FDI, and is a common feature in countries reviewed which have been successful in attracting inward investment. Other factors, such as skills, infrastructure and R&D, are seen as key issues to support low tax rates, rather than as a substitute to initially influence investment decisions.

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<sup>13</sup> Centre for Business Research (2011) *Building Economic Competitiveness: Lessons from Small Peripheral European States*, Commissioned by DETI. University of Bradford (2011) *Productivity, Innovation and Competitiveness in Small Open Economies*, Commissioned by DETI.

Analysis was undertaken in the research which sought to quantify the importance of corporation tax for attracting FDI. An econometric model was developed to assess the key drivers of FDI performance of 10 small peripheral economies (in addition to Northern Ireland and the UK) over the period 2003-09. This highlighted that:

- Corporation tax was the most significant variable in explaining differences in FDI performance amongst small open economies;
- A 1 percentage point reduction in the corporate tax rate will, on average, lead to a 10% increase in the number of FDI jobs promoted (per capita);
- This estimate is in line with a similar study reviewed by the OECD<sup>15</sup> which concluded that a 1 percentage point fall in corporation tax is associated with a 7-14% rise in inward investment flows; and
- Low wages are also significant in attracting FDI but have a much smaller effect than corporation tax (being around one-tenth as effective).

In summary, the research points to the important role of low corporation tax in attracting FDI to small open economies. It indicates that economies which have pursued a low-tax strategy to attract FDI have been successful at increasing living standards and productivity through attracting high value multi-national companies. However, while low corporation tax is found to be a key factor in attracting FDI, the evidence also confirms that factors such as skills and infrastructure are also important to support and enhance overall economic growth.

### 5.3 Republic of Ireland (RoI)

#### **Corporation Tax in the Republic of Ireland**

The RoI is a useful comparator country to understanding the potential impact of a reduction in corporation tax in Northern Ireland. The RoI has a 12.5% corporation tax rate and exhibits many similar characteristics to the Northern Ireland economy, including location, demographics, workforce, language and culture.

The RoI began to pursue a low tax strategy with the introduction of the Exports Profits Tax Relief which was introduced in the 1950s and aimed at encouraging domestic exports. However, it was not until the establishment of the Irish Financial Services Centre (IFSC) in 1987 that the effect of the reduced rate of corporation tax (10%) was extended to companies involved in internationally traded financial services. In order to comply with EU rules, the

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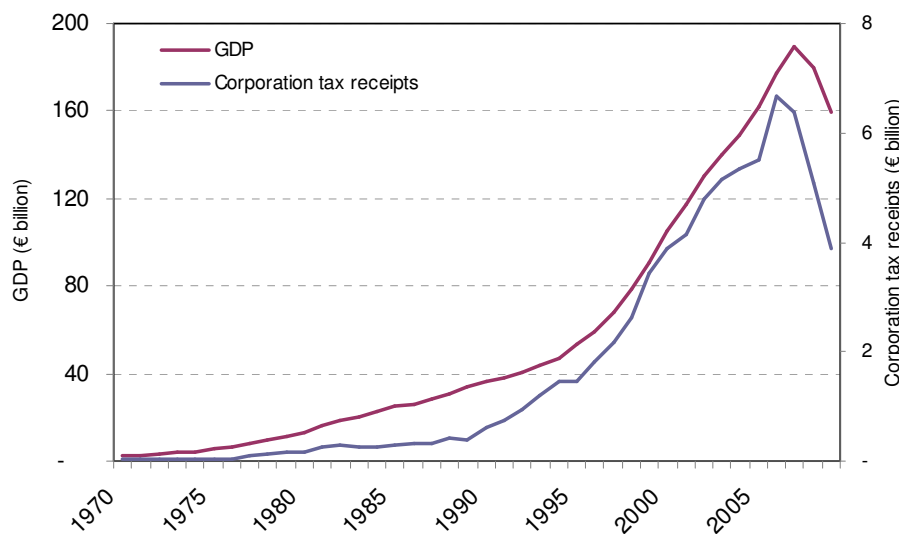
<sup>15</sup> OECD (2007) *Tax Effects on Foreign Direct Investment: Recent Evidence and Policy Analysis*, Tax Policy Studies, No 17, Paris

Rol government, in 1996, decided to move to a harmonised rate of corporation tax by 2003.

These policy decisions had the effect of reducing the applicable rate of corporation tax in the business and financial services sector from 40% in 1994 to 12.5% in 2003<sup>16</sup>. These changes also coincided with rapid economic growth at a sectoral and national level. Figure 5.4 illustrates the growth in both GDP in the Rol and corporation tax receipts accruing to the Rol Government between 1970 and 2010. The growth in rates, even with the substantive cuts in the corporation tax rates, follows a similar path and increased dramatically from the early 1990s to 2007, prior to the onset of the global recession.

The importance of the market services sector<sup>17</sup> to the Irish economy also increased dramatically since the 1990s, mainly driven by business and financial services. The sector has increased to represent 67% of the total value of the market services sector, as well as contributing 37% of total economy exports in 2005<sup>18</sup>. The sector also increased its contribution to Government corporation tax receipts, from 20% to 30% over the period (from €290m in 1994 to €1,734m in 2006<sup>19</sup>).

**Figure 5.4 – Rol GDP & Corporation Tax Receipts 1970-2010**



Data Source: Central Statistics Ireland

<sup>16</sup> Conefrey and Fitz Gerald (2011) The macro-economic impact of changing the rate of corporation tax, ESRI

<sup>17</sup> The Market Services sector contains the Business and Financial Services / Transport and Communications / Distribution sectors

<sup>18</sup> Conefrey and Fitz Gerald (2011) The macro-economic impact of changing the rate of corporation tax, ESRI.

<sup>19</sup> Quarterly Economic Commentary, Spring 2011

## Recession

From the onset of the global downturn, the RoI economy has significantly contracted by 3.5%, 7.6% and 1.0% in 2008, 2009 and 2010 respectively. The Economic and Social Research Institute (ESRI) forecast that the RoI economy will return to growth in 2011, both in terms of GDP and GNP, with growth rates of 2.0% and 0.5% respectively. Stronger growth is predicted in 2012, however, at levels much lower than pre-recession.

The intense economic and financial pressures led to an international rescue package totalling €85m, which was supported by the EU and the International Monetary Fund (IMF). This was also combined with a bilateral loan from the UK Government of £3.25m. Following the EU / IMF Bailout, the Republic of Ireland's Government published its National Recovery Plan (November 2010) and Budget (December 2010) which outlined measures to reduce expenditure by almost €16bn up to 2014.

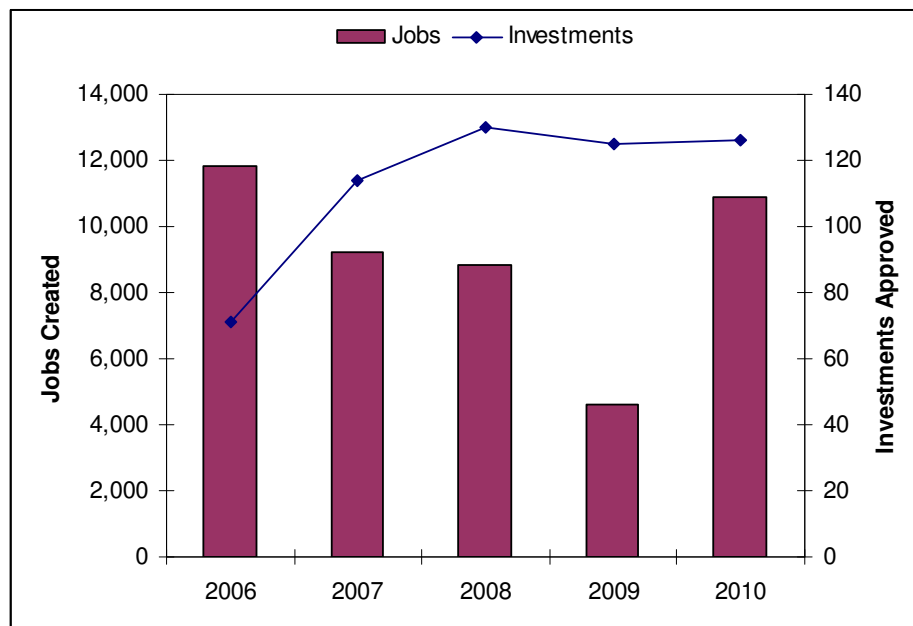
However, despite intense pressure, the RoI Government has been able to maintain its 12.5% rate of corporation tax. Indeed, a recent Jobs Initiative document from the RoI Government has recommitted to maintaining its low level of corporation tax to stimulate growth in the economy<sup>20</sup>. The Government clearly views the current level of corporation tax as an integral tool in its armoury to re-establish sustained economic growth.

As would be expected, the global economic slowdown has reduced the availability of FDI worldwide and this had a significant impact on investment into the RoI. Figure 5.5 highlights that the number of FDI jobs created by IDA Ireland fell year-on-year from 2007-09. However, during this period the number of investments into the RoI has increased, suggesting that companies continued to invest in the RoI but economic challenges have resulted in relatively small investments. By 2010, FDI jobs created have returned to near pre-recession levels.

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<sup>20</sup> <http://www.finance.gov.ie/documents/publications/reports/2011/Jobinitiative.pdf>

**Figure 5.5 – IDA Jobs Created and Number of Investments**



Source: IDA

The strong FDI performance in the RoI has been reported by the National Irish Bank / fDI Intelligence Inward Investment Performance Monitor 2010<sup>21</sup>. The Monitor takes account of FDI projects won, capital investment, jobs and GDP, adjusting for the size of the country and ranks them with their global competitors. The 2010 Monitor results indicate that:

- The RoI is the second most attractive country globally for FDI, behind Singapore;
- The number of projects coming to Ireland increased by 15% in 2010, with a corresponding increase in the rate of job creation;
- Quality of jobs is high, with a relatively high proportion involving R&D and headquarter facilities; and
- The improving global economic prospects should result in continued FDI growth in 2011.

The strong FDI performance of the RoI in 2006 (pre-recession) and 2010 (exiting recession) gives a good indication of the potential benefits that a low corporation tax rate could deliver for Northern Ireland. For example, in comparison with Northern Ireland, the RoI created more than three times as many FDI jobs during 2008-10, even with the fall in performance during the recession. This suggests that a lower rate of tax in Northern Ireland could deliver significantly more FDI jobs than the 6,500 target included in the Programme for Government 2008-11 (it should be noted that Invest NI was

<sup>21</sup> <http://www.nationalirishbank.ie/PDF/About-the-Bank/Press-release/NIB-fDi-Investment-Performance-Monitor.pdf>

able to significantly exceed this target, both in terms of jobs promoted – over 7,500 were promoted by 2010/11<sup>22</sup>, and also value added employment, with over 5,600 above the private sector median).

## 5.4 Estonia

### **Economic Reform in Estonia**

Estonia is a small nation with a population of 1.3m which proclaimed full independence from the former Soviet Union in 1991. The first Government reoriented trade away from Russia towards Finland and other Western countries. Since independence, Estonian policy has promoted an open economy alongside fiscal discipline. Wholesale prices were liberalised in 1991, and foreign investment was actively pursued through privatisation and liberal legislation governing land ownership. To open the economy to world markets, Estonia reduced trade tariffs and non-tariff barriers and abolished all export restrictions, making the nation a free trade zone.

Openness to trade brought to Estonia many new companies, which opened various export-orientated factories. Estonia was also successful in creating a business environment that favours local domestic investment and foreign investment without distinction. In the mid 1990s, Estonia went from an almost unknown for foreign investors to an important international FDI destination. For example, Estonia received more FDI per capita in the second half of the 1990s than any other country in Central and Eastern Europe.

In designing the tax system, the Government decided that the entire tax system should favour savings and investments and encourage people to create new wealth. The tax regime is simple, with a flat rate personal income tax introduced in 1994. The single income tax rate has fallen from 26% in 2004 to 21% in 2008. Corporate Tax is levied at the same rate as income tax and is levied only on distributed profits.

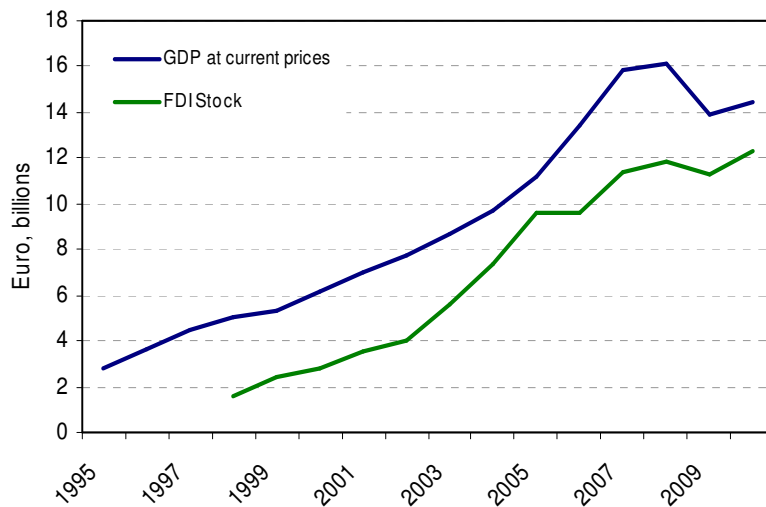
In addition, Estonia is keen to encourage investment so any corporate profits that are reinvested are exempt from corporation tax. This approach appears to be having an impact with re-invested earnings accounting for 50-70% of total annual FDI in recent years.

Figure 5.6 provides evidence of the level of growth in Estonian GDP over the last twenty years, with output increasing over the period from €2,766m in 1995 to €14,501m to 2010. This dramatic growth has been in tandem with increased levels of FDI inflows and the consequential build-up of FDI stock in the economy. Levels of FDI inflow and stock both increased over the period from €148m and €1,561m to €1,197 and €12,269m respectively.

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<sup>22</sup> Invest NI figures related to 2008/09 to 2010/11

**Figure 5.6 Estonia GDP and FDI Stock/Inflows 1995-2010**



Data Source: Statistics Estonia and Bank of Estonia

In summary, there exists evidence from other small open economies that reinforce that Northern Ireland should seek, and be granted, the powers to reduce the rate of corporation tax, and to do so in a manner that is affordable to the Executive / Assembly. Introducing a lower and more competitive rate of corporation tax is seen to help attract value added FDI and also boost indigenous business investment. It should therefore be part-and-parcel of the Executive and Coalition Government's plans to rebalance the Northern Ireland economy over the medium to longer term.

## 6 Annex

### 6.1 Revised baseline

This Annex has been prepared by Oxford Economics (OE) to provide additional information on the content and workings of the corporation tax model and its additional scenarios.

The standard Oxford Economics baseline forecast (Spring 2011) has been adjusted to account for:

1. The impact of recent changes to the UK Corporation Tax rate; and
2. The transfer of spending by Invest NI from Selective Financial Assistance (SFA) into R&D spend.

These adjustments have the effect of changing the baseline downwards slightly for jobs and upwards for total GVA. This is primarily because the literature on R&D spend focuses on impacts on total factor productivity rather than on employment. In contrast, the evidence on the impact of SFA suggests substantial impacts on employment levels but not on productivity.

#### ***Reduction in UK Corporation Tax***

The changes to the baseline forecast to allow for the impact of a proposed reduction in UK corporation tax rates are estimated using the equation described earlier in this report. The additional output and employment due to additional new FDI projects is then fed into the baseline in the OE tax model to generate the revised baseline. The feedback effects from an alteration to the PE block are disabled as there will be no direct implication for public funding in Northern Ireland.

#### ***Reduction in SFA spend***

The reduction in SFA has been modelled by examining the Invest NI data on the number of jobs created and safeguarded in each of the last 8 years and taking an average. This suggests that around 6,600 jobs per annum result from the spend of approximately £65million per annum (total spend on FDI 2002-2010 was £520m). There is controversy over the level of deadweight within this support (i.e. the amount of investment and hence jobs that would have occurred anyway without the government support). In addition there is contention over how many jobs are actually delivered as opposed to 'promoted' as this historically was not monitored (though it is now).

Deadweight of 50% has been assumed for all scenarios and an 85% conversion from promoted to 'actual' realised jobs. This reflects evidence from the Independent Review of Economic Policy. Two thirds of the average recent spend (i.e. £40m per annum) is assumed to be removed from SFA spend and

transferred to R&D spend. This assumption was applied on the advice of the EAG.

The assumption of a two-thirds reduction in Invest NI spending on SFA grants equates to a reduction of 28,800 jobs, and £2,200m GVA by 2030 (£2006 prices), based on average productivity in each sector. Note that supply chain multiplier effects are not applied in this case (or consumer spending multiplier effects) because of the largely offsetting impacts from the reduction in UK corporation tax rate and the spend on R&D. In addition, some of the jobs themselves may be supply chain jobs to other firms within the calculation. The loss of jobs is spread across the economy with business services the largest single sector but manufacturing also has significant job losses.

**Table A.1: SFA - assumptions**

	New jobs, avg 05-10	Safeguarded jobs, avg 05-10	Jobs lost by 2030	Additional GVA by 2030 (£m)
Agriculture	0	0	100	0
Extraction	0	0	100	0
Manufacturing - food, drink & tobacco	300	400	3,100	300
Manufacturing - textiles & clothing	100	0	400	0
Manufacturing - wood & wood products	0	0	200	0
Manufacturing - pulp, paper & printing	100	0	400	0
Manufacturing - coke, oil & nuclear	0	0	0	0
Manufacturing - chemicals & pharmaceuticals	200	100	900	200
Manufacturing - rubber & plastics	100	100	1,000	100
Manufacturing - other non-metals	100	100	600	0
Manufacturing - metals	200	0	1,000	100
Manufacturing - machinery & equipment	200	100	1,200	200
Manufacturing - electrical & optical equipment	200	400	2,700	300
Manufacturing - transport equipment	300	200	2,000	200
Manufacturing - other manufacturing nec	200	100	1,200	0
Electricity, gas & water	0	0	0	0
Construction	100	0	500	0
Distribution & retail	100	0	500	0
Hotels & restaurants	100	0	300	0
Transport & communications	100	0	700	0
Financial services	400	0	1,500	200
Business services	2,300	100	10,400	500
Public admin. & defence	0	0	0	0
Education	0	0	100	0
Health	0	0	0	0
Other personal services	0	0	100	0
<b>Total</b>	<b>5,000</b>	<b>1,600</b>	<b>28,800</b>	<b>2,200</b>

***Increased R&D spend***

The assumption of a transfer of Invest NI support to R&D spend has been modelled within the revised baseline (again on the advice of EAG). There are two important caveats to bear in mind with this approach.

1. True R&D: The estimation of which sectors have benefitted from R&D support in the past is drawn from Invest NI data on ‘innovation’. This includes a much wider set of programmes including training support and other non R&D type schemes. The model assumes that **all** the

transferred spend (£40m per annum) is spent on true R&D and not the other types of programme. Other programmes such as training are likely to have much higher deadweight levels than R&D programmes. The co-efficients used to estimate the impact of R&D on productivity are taken from Harris, Li and Trainor (2006) report for DETI 'Assessing the Case for a Higher Rate of R&D Tax Credit in Northern Ireland' and are only applicable if the spend is on genuine R&D.

2. Absorptive capacity: There is no guarantee that Northern Ireland firms would be in a position to absorb additional levels of R&D support. However, in the medium to longer term the additional firms attracted by the corporation tax reductions may be more able to avail of the additional support. In the short run, given that firms current demand is not limited by available funds, the step up in volume is far from certain.

The impact of the transferred spend from SFA to R&D grants is to increase productivity across the sectors in which the investment occurs. The published literature suggests that a doubling of R&D stock should result in a roughly 10% increase in productivity levels over a period of around 10 years. The precise returns across sectors is published (elasticities for individual sectors are given) in Harris, Li and Trainor (2006). The overall amount of additional grant funding assumed to be available i.e. £40m, would involve an approximate doubling of grant support for R&D in Northern Ireland. We have assumed that Northern Ireland firms will respond to this increase in grant availability by a doubling of the R&D stock over a period of around 7 years.

The result of modelling based on these assumptions is for an increase of approximately 7.5% in overall productivity in the economy. A modest feedback onto employment is forecast, though the published literature makes no direct reference to employment levels (and Invest NI do not record any employment effects for their R&D programme spend). This is to reflect the fact that the increased R&D should itself require staff to carry out the research. Whether additional employment would be expected in the wider firm will depend on whether the impact of the higher productivity is to reduce prices and increase product quality and hence to expand sales, or to reduce costs and perhaps jobs. Another issue is whether the impacts occur in the same region as that in which the research is undertaken.

Overall GVA is forecast to rise by £3,200m in 2030, and employment by 6,000 jobs.

### ***Revised baseline – summary***

All three changes listed above generate employment which is 3,000 lower by 2030 compared to the Oxford Economics baseline, and GVA which is £2,995m higher. The extra FDI attracted by lower UK corporation tax offsets the impact on employment losses (of moving funds away from SFA and towards R&D), resulting in changes which are modest in the short run.

Sectorally the impact is to accelerate the trend towards business services, with the new jobs attracted by corporation tax being more prevalent in this sector and less prevalent in manufacturing.

**Table A.2: R&D – key assumptions**

	Average value of support, 05-10 (£m)	Additional jobs by 2030	Additional GVA by 2030 (£m)
Agriculture	100	300	0
Extraction	200	0	0
Manufacturing - food, drink & tobacco	3,300	300	200
Manufacturing - textiles & clothing	700	0	0
Manufacturing - wood & wood products	1,300	0	0
Manufacturing - pulp, paper & printing	1,200	0	0
Manufacturing - coke, oil & nuclear	0	0	0
Manufacturing - chemicals & pharmaceuticals	3,700	100	200
Manufacturing - rubber & plastics	2,000	100	100
Manufacturing - other non-metals	800	0	0
Manufacturing - metals	2,200	100	100
Manufacturing - machinery & equipment	4,100	100	100
Manufacturing - electrical & optical equipment	6,700	200	200
Manufacturing - transport equipment	4,600	200	200
Manufacturing - other manufacturing nec	1,200	100	0
Electricity, gas & water	100	0	0
Construction	1,000	300	100
Distribution & retail	1,400	700	300
Hotels & restaurants	500	300	100
Transport & communications	500	400	200
Financial services	800	100	100
Business services	13,000	2,200	1,200
Public admin. & defence	0	0	0
Education	1,300	0	0
Health	0	0	0
Other personal services	100	300	100
<b>Total</b>	<b>51,000</b>	<b>6,000</b>	<b>3,200</b>

**Table A.3: Employment and GVA summary**

	Total employment, 2030 (000's)	Total GVA, 2030 (£m)
Oxford: baseline	865	39,300
SFA spend adjustment	29	2,200
R&D spend adjustment	6	3,200
UK corporation tax adjustment	20	1,900
Adjusted baseline	862	42,200
Difference (adjusted baseline - Oxford baseline)	-3	2,900

## 6.2 Description of the Corporation Tax model

### ***Links to the Oxford suite of models***

The corporation tax model is a set of accounting relationships and behavioural linkages which linked to the core Oxford Economics regional forecast model. This forecast model, in use for over twenty years, is built around an output-based forecasting system and is linked into the Oxford Economics suite of global, regional and sub regional models. Further detail on the structure of the regional model is available from Oxford Economics upon request.

### ***The revised baseline***

As described above, the Oxford Economics Spring 2011 forecast has been modified for the analysis presented in this report to allow for changes to the UK rate of corporation tax and an assumed shift in Invest NI spending priorities.

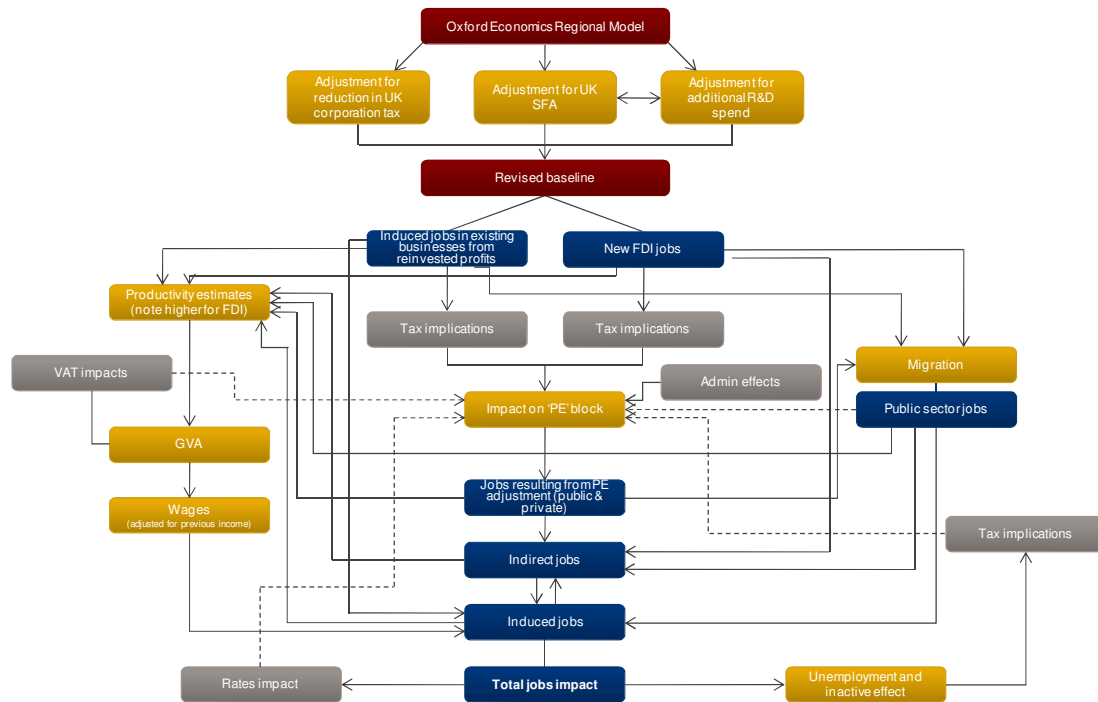
### ***Introduction of Corporation Tax***

The scenarios all assume that the reduction in corporation tax rates is announced in 2012, with implementation not taking place until 2014. Additional FDI flows and re-investment by existing firms, in response to the lower tax rate, is expected to commence prior to the implementation as firms 'gear up' to take advantage of the new rates. The build-up of new investment is initially staggered with 25% of the full estimated effect in 2013, 50% in 2014, 75% in 2015 and the full impact from 2016 onwards. Budget implications, with reduced corporation tax revenues, occur after implementation with a reduction in the block grant applied from 2015 based on the tax changes in 2014.

### ***Overall structure***

Figure A.1 outlines the broad set of linkages and relationships within the corporation tax module, each of which is described in the section below.

**Figure A.1: Structure of the Corporation Tax model**



### **FDI flows**

New FDI flows, attracted by the lower corporation tax rate, are estimated. These are based on econometric work carried out previously for the Economic Reform Group (ERG) and refined for inclusion in the DETI research into lessons from peripheral countries carried out by the Cambridge University Centre for Business Research (CBR). The forecasts are based upon data supplied by fDi intelligence and relate to new Greenfield FDI in export sectors. The sectors thus excluded are retail, construction and other sectors in which the investment was likely to have taken place to service local rather than export markets. The data does not include mergers and acquisitions and do not include expansions of existing foreign-owned firms. A special run of data was requested from fDi Intelligence to ensure this was the case. The data related to a set of 10 small peripheral countries plus the GB and Northern Ireland. All of the countries were European except Singapore which was included because of its particular success in attracting new FDI.

The direct relationship identified between the rate of tax and the jobs promoted in FDI firms per thousand population is set out in the figure below. The equation included in the model was based on a regression analysis in which there were initially seven variables. Three of these were statistically significant and were retained in the final equation. These are:

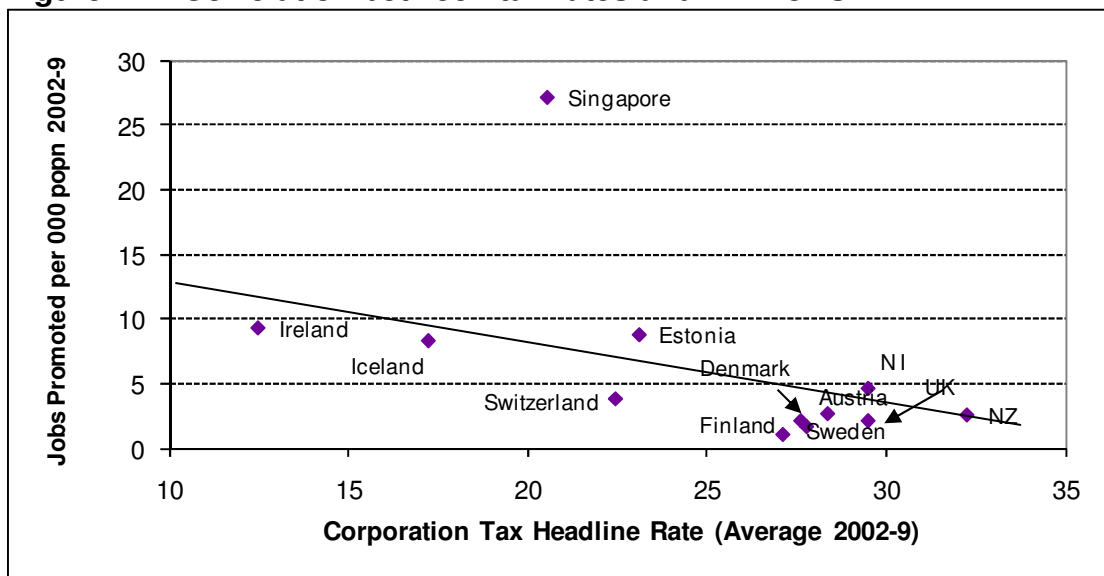
- Corporation tax, headline rate, average 2002-9
- Production workers wage rate in US\$ (USA=100)

- Index of labour market regulation

The squared correlation coefficient for this equation was 0.87. A variant of this equation with a logged dependent variable (jobs promoted per thousand population) gives a higher squared correlation coefficient (0.94) but the statistical significance of the corporation tax rate remains the same. Using the logged form would be more conventional (it provides a so called semi-elasticity in which the proportional increase in FDI is related to the percentage points change in the corporation tax rate). This would also increase the projected number of jobs projected for a corporation tax rate of 12.5% by around 400 jobs per annum. The linear form is used here for reasons of simplicity and ease of understanding, but it is important to state that this could potentially understate the impact of reduced corporation tax rates by a few hundred jobs per annum.

This analysis suggests a particularly high level of FDI inflows into Singapore given its corporation tax rate. Half of this advantage is ‘explained’ in the equation by low wages and low levels of labour market regulation. The other half is unexplained by the equation but may reflect the strong customer focus and high performance culture of Singapore’s Economic Development Board noted in the IREP Report (p125), as well as the rapid expected growth of the East Asia region. Among the European countries, it is corporation tax rates which explain most of the difference between countries. We can note that in this analysis RoI has a negative residual despite the widely held admiration for the effectiveness of the IDA (RoI’s success appears to be largely due to its low corporation tax rate). Also Northern Ireland has a positive residual of around 600 promoted jobs per annum. This could be ascribed to the generous grant regime in Northern Ireland.

**Figure A.2: Correlation between tax rates and FDI flows**

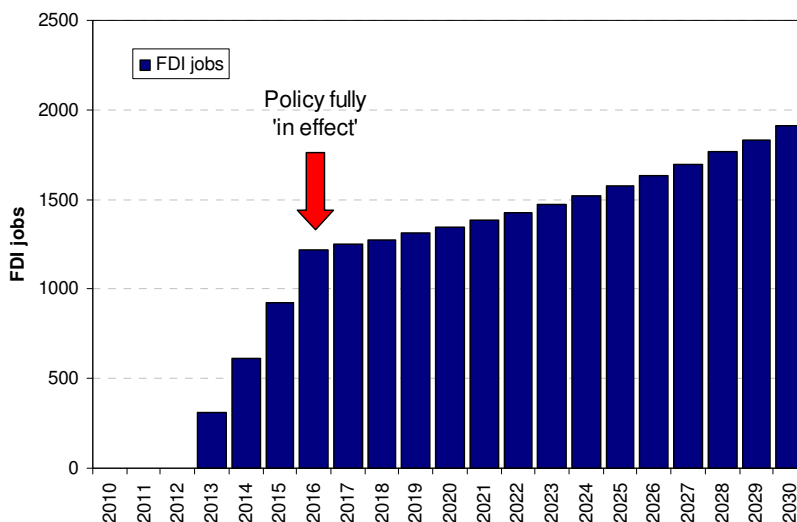


Source: Oxford Economics

While the equation determines the initial year level of new greenfield FDI in the model, levels in subsequent years are increased by an estimate of the annual growth in international FDI flows. These are projected on the basis of the Oxford Economics outlook for international sectoral FDI based on an extrapolation of pre-recession rates of growth in FDI by sector. This has the effect of increasing the inflow of professional services FDI and reduces industrial FDI. The net effect is to increase the number of FDI jobs promoted (and created) by 2.4% per annum. This is almost exactly the same rate as projected by fDi Intelligence for international FDI jobs flows in the ongoing report for DETI (referenced in the main body of the report).

The forecast for long term rates of FDI into Northern Ireland is for an increase of roughly 1,350 new FDI jobs per annum (from 2016). The trend over time is depicted in the figure below:

**Figure A.3: Annual FDI flows**



Source: Oxford Economics

This forecast assumes only that the world ‘pot’ of FDI continues to increase, and does not make any assumption about other factors in relative attractiveness such as skills, quality of life, infrastructure etc. Equally it assumes that relative taxation rates between Northern Ireland and global competitors remain unaltered.

The proportions of FDI in each sector are set out in the table below for 2016 (the start of the policy) and 2030 (the end of the forecast period). FDI jobs will also come into Northern Ireland in other sectors including retailing, tourism and construction, but (in OE’s view) these are largely unaffected by corporation tax rates and are implicitly absorbed within the baseline rather than in the scenarios.

The sectoral composition of future FDI flows is complex to project and the recent past is not always the best predictor. The forecasts used in this project are based on analysis of recent in-flows into RoI (since 2000) but adjusted to reflect specific conditions. For example FDI flows in the construction sector or in consumer driven sectors such as retail are not included. Equally finance is not directly included due to the very specific nature of the basket of tax incentives that RoI has to attract firms in this sector. The dominant sector is business services (72.2% of the inflows in 2016, rising to 83.3% by 2030), which covers a wide range of sub-sectors. It includes headquarters (of any sector) and back office functions so in that regard some financial services would be included. It is envisaged that professional services and ICT service sectors would form the bulk of this investment. It is important to bear in mind that many professional services firms (particularly in accountancy and legal services) are partnership type structures and would not benefit from the Corporate Tax environment, though they may benefit from being close to firms who do. Ongoing work by FDI Intelligence will be looking at sectors carefully and the sectoral composition of inflows can be revisited when this analysis is complete. The annex provides more detail on the sectoral composition of FDI inflows that is built into the model.

**Table A.4: Sectoral composition of projected FDI flows**

	2016 % of total jobs	2030 % of total jobs
Agriculture	0%	0%
Extraction	0%	0%
Manufacturing	27%	8%
Electricity, Gas & Water	0%	0%
Construction	0%	0%
Distribution	0%	0%
Hotels & Restaurants	0%	0%
Transport & Communications	0%	0%
Financial Services	0%	0%
Business Services	72%	92%
Public Admin. & Defence	0%	0%
Education	0%	0%
Health	1%	1%
Other Personal Services	0%	0%
<b>Total</b>	<b>100%</b>	<b>100%</b>

Source: Oxford Economics

### **Impact on existing firms**

The reaction of existing firms to the cut in corporation tax is dependent upon the level of corporation tax currently being paid and thus the amount they stand to save from a lower corporation tax rate and thus potentially reinvest. The scenarios assume that one third of the tax saving is re-invested in Northern Ireland. This requires estimates of the amounts of corporation tax paid by existing foreign and domestically-owned firms at different rates of corporation tax. This, in turn, requires estimates of the taxable profits in these firms. As an approximation to the latter we use the ‘surplus’ in ONS Regional

Accounts data, defined as GVA less compensation of employees. We then calculate what proportion of this 'surplus' is paid in corporation tax at different corporation tax rates.

The Regional Accounts data used in the model relate to 2003. Comparisons were made with the Annual Business Inquiry (ABI) which provides employment costs as a proportion of GVA but does not offer full coverage of the economy and they were not used.

Using this method a total 'surplus' of GVA minus employed costs of approximately 40% of GVA is calculated (the figure varies by sector). Separate estimates are made for foreign and domestic firms, using data provided by the University of Nottingham as part of their work on the ERINI corporation tax report. An effective tax rate is applied to the surpluses of foreign-owned and domestically-owned firms respectively using the UK ratio corporation tax revenues to the calculated 'surplus' from national accounts. A factor is applied to the domestic and international estimates to reflect the fact that more international firms would be paying tax at the higher rate. The relevant figures at a corporation tax rate of 28% are an effective tax rate of 6.4% for domestic firms and 9.6% for foreign-owned firms.

This approach generates an estimate of corporation tax broadly similar to that used in the Varney report for 2007 (£500 million compared to £550 million). This is well below the equivalent DFP figure published in 2009 of £890 million for 2006/07, though this was done purely on a pro rata basis.

Forecasting corporation tax returns for new FDI firms is done on a similar basis, applying the effective rate to the projected surplus from the Oxford Economics forecasts (including forecast employment and GVA changes as a result of the policy change).

The saving on corporation tax paid by existing firms is assumed to be split between additional spending (one third) additional investment (one third) and retained or saved profits (one third). In the case of international firms the only feed back into the model is through re-invested profits. This is done on the basis of an assumed capital stock per employee of £200,000 across all sectors. The same methodology is applied to domestic firms but the one third of profits spent is also translated (via ratios of jobs per pound spent) into jobs related to consumer spending in retail, hotels / restaurants and other personal services.

### ***Impact upon employment derived from public sector finances***

The impact of any change to the level of public finance is a complex calculation based on a tax revenue module within the model. This is set out separately at the end of this annex.

The results of this modelling work arrives at an estimate of the net 'change' to the level of public finance available to Northern Ireland. This occurs through alterations to the block grant, but also through changes in corporation tax revenues and local rates income which are entirely a matter for the Northern Ireland Assembly.

The impact upon public sector jobs depends on two things:

- 1) Changes in the tax revenues generated by new FDI and existing firms and how much of this tax revenue is retained in Northern Ireland rather than accruing to the UK Exchequer.
- 2) Whether the impact is assumed to fall upon the public or the private sector (perhaps through additional taxation or reduced public sector procurement). We assume throughout that social security and pension rates remain at UK levels.

At present, the taxes projected to have a feedback into the Northern Ireland public finances (and consequently the wider economy) are corporation tax, income tax, national insurance contributions and local authority and regional rates. VAT receipts, social security benefits savings and additional costs incurred by a larger population are not included in the calculation as it is not envisaged that they are likely to be possible for Treasury to calculate and thus to provide an adjustment to Northern Ireland's public expenditure block. These tax and benefit rates are assumed to remain at UK rates in all scenarios.

In addition to tax revenues the estimated net impact of transfer pricing (Rest of the World transfer pricing into NI minus transfer pricing from GB into NI) are also added to the 'net tax effect'. Equally the net impact on tax revenues of an expected increase in incorporation levels (as individuals seek to incorporate to lower their tax bills through incorporation) is also added. This 'tax motivated incorporation' is the net figure calculated by subtracting the loss to income tax from the increase in corporation tax returns. Estimates for transfer pricing and TMI are taken from Treasury estimates in their recent Consultation document.

As outlined in the main body, no administrative or compliance costs are included in the modelling (nor are the included in the latest Treasury estimates).

The level of additional net tax generated is converted into public sector jobs using published Office of Budget Responsibility (OBR) estimates of the changes in UK Public Expenditure and its forecast reduction in general government employment (£51,000 for 2010 and growing at 2% per annum). This is forecast, again in real prices, into the future and in conjunction with the net change to public finances is used to produce a change to public sector jobs (75% in public administration, 10% in health and 15% in education).

In the short run there is a net loss of tax revenues to the Northern Ireland Executive. This is assumed to result directly in lost public sector jobs. In the longer run, as the policy attracts additional investment, output and jobs, there are net gains to the Northern Ireland Executive in tax revenues that are translated back into employment.

During the period in which the year on year change in the level of public finance available is negative, it is assumed that the public sector bears 100% of the costs. When net tax revenues become positive, only half of the increase is translated back into public sector jobs and the rest is split between spend on construction and on consumer services (in effect equivalent to more capital spending and higher wages). The cost per job is much higher in the private sector, reflecting greater leakages through imports, expatriated profits and other factors. In other words, the greatest job impact comes via additional public sector workers but this increases the dependence on the level of public finances.

Multiplier effects are described below, but it is helpful to note here that the impact of changing tax revenues has a multiplier impact. The additional tax generated by the jobs 'purchased' by the additional tax revenues flowing to the Northern Ireland Executive in turn generates additional tax revenues which then, in turn, generate additional public finances to be invested. This pattern continues almost indefinitely over time, diminishing in scale each year.

It is important to consider how likely it is that any additional tax generated may be retained in Northern Ireland and hence be available for public spending in Northern Ireland. The Azores criteria mean that Northern Ireland should bear the full costs of any change in corporation tax and this implies that Northern Ireland should also gain from all additional tax revenues generated via a change in corporation tax rates.

It is important to consider other ways in which costs of a low tax policy could be minimised. The balance of where the revenue losses fall (between the public or private sectors), and the other ways in which the public sector might absorb the costs (through efficiency savings, diverting spend etc.) all need careful consideration.

### ***Migration and labour supply impacts***

The model forecasts a level of migration in response to the new jobs projected (or migrants lost in the case of reduced numbers of jobs). The level of migration is primarily based upon the tightness of the labour market (as measured through employment rates). The tighter the labour market, the more in-migration is projected. In reality, the amount required is very modest given the excess capacity in the labour market at present and indeed throughout the forecast period. There may be other factors influencing migration patterns, for example specific skills shortages and certainly the ROI experience suggests

significant in-flows are a distinct possibility. In the central scenario the estimate is that 10% of total jobs are projected to be taken by migrants.

Jobs that are not taken by migrants are taken either by the unemployed or the inactive. 30% are assumed to come from the unemployed with a larger proportion taken from the inactive (which includes students, people looking after the home, early retired amongst others). The split is constant over time and across sectors, this could be further refined to have varying assumptions across different sectors.

### ***Public sector jobs – population based***

As a result of the population change, additional (or fewer in the case of a population fall) public sector workers are included in the forecast. This is forecast by relating the number of public sector workers per head in the baseline to the additional population. This reflects the demand for police, teachers and other public servants directly linked to population. (This is included because input/output tables used to calculate multiplier effects ignore supply side factors and thus say nothing about additional population stemming from the need to meet the additional demand).

### ***Multiplier effects***

The output and jobs created in new FDI and existing firms, and through any taxation-related changes, in turn create ‘multiplier’ effects through their supply chain (indirect effects) and the spending from the additional wages earned in the new jobs (induced effects). In the absence of published Northern Ireland Input/Output tables, UK tables have been used to calculate these multiplier effects.

The total number of jobs created are fed into an Input/Output Matrix to determine overall supply chain effects. To do this, the jobs are translated via productivity estimates into GVA, then via GVA to output, as these are the units in which Input Output tables are expressed. A similar set of steps turns the multiplied (or indirect) output back via GVA and productivity into employment.

No specific adjustment has been made to reflect differences between Northern Ireland and the UK in the level of imports, but an overall factor is applied to the level of the final multiplier to reflect greater leakages from a small regional economy compared to a national economy. The overall magnitude of the multipliers (1.4 for indirect multipliers) is in keeping with guidelines presented by English Partnerships in guidelines for economic impact assessment work. This is a reasonable approach to use in absence of supply chain information for either current firms or the expected new FDI firms.

The multipliers are not dynamic, in the sense that the changes are not fed back into the Input/Output Matrix itself (as would be the case in a fully realised General Equilibrium model) since this is not likely to add much additional accuracy to the overall forecasts. However, the Input/Output table used here has been pre-multiplied to estimate the impact of all rounds of purchases and not just the initial rounds, and hence the lack of a dynamic approach is less important. In addition, the multipliers used are reflective of the nature of the initial impact of the tax, i.e. the sectoral balance is fixed throughout the forecast period. In practice, a more accurate system could be developed to reflect the changing structure of the new jobs that are being created on an annual basis (so for example different multipliers from the public sector jobs created in the long run). This would affect the sectoral composition of the multipliers but not the overall magnitudes.

Spending multipliers (type two multipliers) are estimated by calculating additional wages, adjusting for any income that the new workers might lose (e.g. social security benefit income) and making an allowance for a portion of the income to be saved and for a proportion to leak out elsewhere (e.g. on foreign holidays). These proportions are 20% and 30% respectively, and are based on published national data. This means that 55% of additional income ends up as local consumer spending. Using the baseline Northern Ireland data, jobs per pound of domestic spending are calculated for retail, hotels / restaurants and other personal services. The spending is then used to estimate the induced employment in these key consumer related sectors.

### ***Total impact***

The total impact is calculated by summing the constituent parts, namely the jobs (or GVA) resulting from:

- Direct jobs / GVA in new FDI and existing firms
- Population-driven public sector jobs / GVA
- Public expenditure-related jobs / GVA
- Indirect supply chain jobs / GVA
- Induced spending effect jobs / GVA

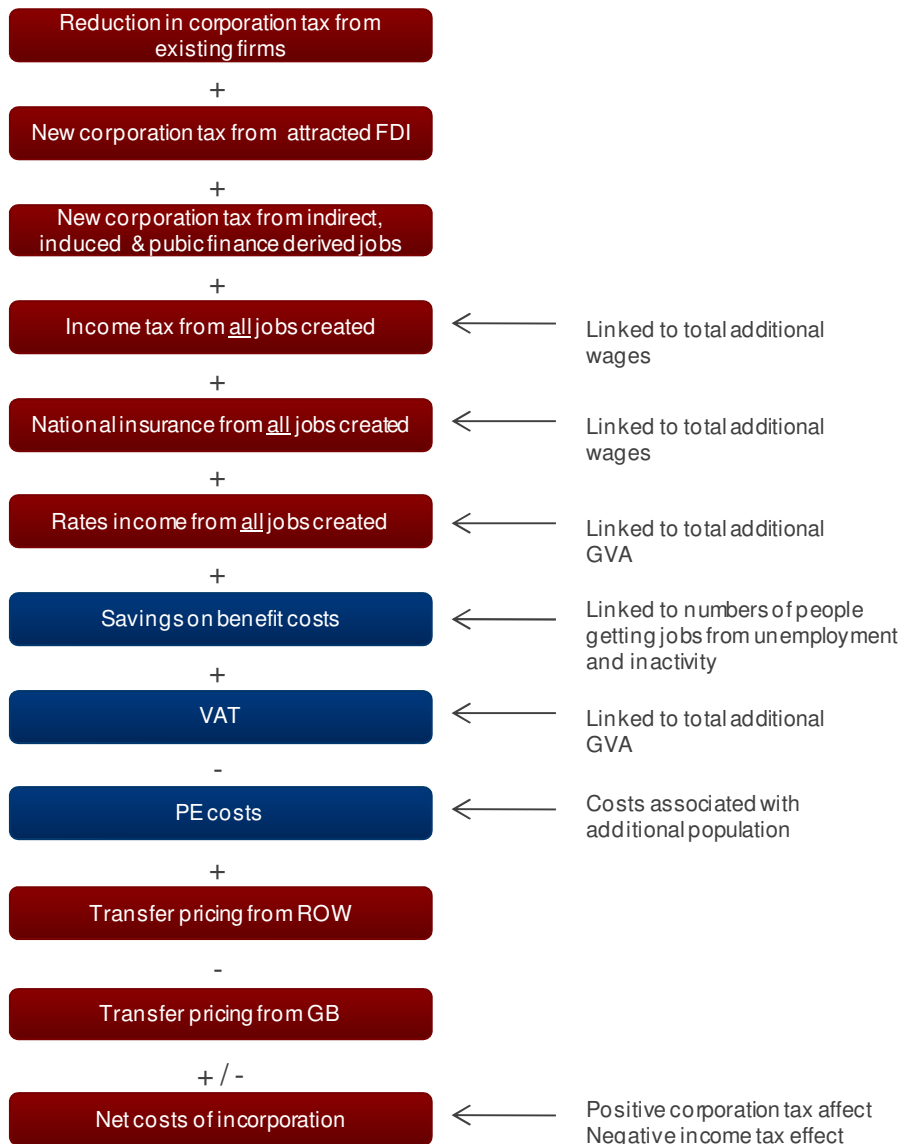
The results are calculated sectorally, and for individual years.

GVA estimates are calculated in 2006 prices. (An increase of 10% will approximate to 2010 prices).

The model also produces wage estimates (again in 2006 prices) linked to the employment and GVA forecasts.

Population, unemployment and inactivity forecasts are drawn from the labour supply estimates (see above for description).

**Figure A.4: Components of the tax calculations**



***Impact upon public sector finances***

The impact of the modelled changes upon public finances is a simple taxation model built within the wider Corporation tax model. This is summarised in the diagram above. Each of the constituent elements of the model is explained in more detail below. All of the taxes are presented in 2006 prices due to the links to GVA forecasts from the OE regional model which is estimated in real price terms. The figures can be converted to nominal prices as required.

**Reductions in Corporation Tax from existing firms**

The method for estimating the reduction in Corporation tax receipts is set out in the section above on the ‘impact on existing firms’. In summary, the

estimates are linked to the forecast for the surplus of GVA minus wages. This is then calibrated to match the Varney estimates for Corporation tax revenues in Northern Ireland in 2006/7.

This loss of tax revenues has a negative effect on PE in Northern Ireland following a reduction in corporation tax in the short run. In the longer run, higher levels of investment leads to a level of tax revenues above that in the base forecast.

### **New Corporation Tax from the attracted FDI**

This additional tax is estimated in the same manner as the taxes lost in existing firms and is based upon applying an effective tax rate to the projected additional surplus (GVA minus employment costs) generated by these firms.

This tax impact has a positive impact on the Northern Ireland 'block'.

### **New Corporation Tax from indirect, induced and public sector derived jobs**

This additional tax is estimated in the same way as corporation tax returns for new FDI and existing firms. It is generated via the projected jobs derived from the supply chain and spending effects, and the changes in public sector revenues. This has an ongoing 'feedback' loop over time as the additional taxes generated create additional public sector jobs, (the opposite occurs in the short run) which in turn affects tax revenues and this feeds back into more public sector jobs.

These tax revenues have a positive impact on the Northern Ireland finances.

### **Ramp up of Corporation Tax rates**

The increase in corporation tax revenues is, in overall terms, relatively modest with a 'break-even' on the overall level only achieved by 2035. In contrast the ROI never experienced a fall in overall corporation tax returns when it reduced its rate.

The corporation tax returns may prove to be a conservative estimate but the very specific nature of the ROI tax revenues, which were heavily driven by significant financial services returns, was one reason not to apply an extremely fast 'ramp-up' in returns. The professional services sector, though profitable, does not on average generate the same level of corporation tax returns as either finance or high end industry such as pharmaceuticals and aerospace. The sectoral composition of inflows is therefore a significant factor behind the slow pick up in overall corporation tax revenues. A second factor is the pick up in corporation tax returns from existing firms who have depressed levels of tax payments during the recession but over the period 2012-2020 are forecast to increase their level of profits and consequently this increases the

level of 'forgone' tax that would have been generated at a higher rate. Finally the corporation tax estimates incorporate the Treasury estimates of transfer pricing from GB which reduces the recorded level of corporation tax and it is 'netted' off the overall estimate.

### **Income tax from all jobs generated**

Additional income tax is calculated from all the additional jobs generated (direct FDI, additional jobs in existing firms, supply chain and spending 'multiplied' jobs and derived public sector jobs). The tax revenues are calculated by taking the ratio of income tax to wages from the UK. The overall figure used is the average of the UK ratios 2002 to 2007 and equates to 16.4% of wages.

The wages are calculated using wages to GVA ratios drawn from Regional Accounts (the ABI was rejected as an approach to this estimation due to incomplete coverage and volatility).

This tax impact is assumed to have a positive impact on the Northern Ireland 'block' once the employment impact becomes positive (i.e. 2017 in the central case),

### **National insurance from all jobs generated**

This tax is calculated in the same manner as income tax. The relevant proportion of wages is 11.7%.

This tax impact is assumed to have a positive impact on the Northern Ireland 'block' once employment becomes positive (i.e. 2017 in the central case).

### **Rates income from all jobs created**

This tax is calculated by taking the ratio of Local Authority (LA) and regional rates income to GVA from the published DFP data on local authority revenue, and applying it to the GVA forecasts. This is not adjusted for sectoral composition of the jobs, even though some jobs are in industries or the public sector where rates are not paid at the full rate (or at all in the public sector's case). The majority of the jobs in the model are in private services so this ratio was considered broadly appropriate for the model

This tax impact is assumed to have a positive impact on the Northern Ireland finances once the employment impact becomes positive (i.e. 2017 in the central case).

### **Savings on benefits costs**

This tax is calculated by taking the estimates for additional employment drawn from the unemployed and the inactive, and applying a level of benefits income

drawn from DSD statistics. A figure of £3,100 per person was used for the unemployed and £4,400 for the inactive in 2005. This was grown at 2% per annum to reflect real price increases.

This tax impact is not assumed to have an impact on the Northern Ireland public finances.

## **VAT**

VAT is estimated based on the ratio of VAT to GVA in the UK and applied to the forecast GVA in the model. The ratio is 7.9% and is fixed over time.

This tax impact is not assumed to have an impact on the Northern Ireland public finances. It is unlikely that the Treasury could identify the level of regional GVA accurately.

## **Public sector costs**

Additional public sector costs are calculated based on a jobs per head calculation in the model. The cost per job estimates are drawn from the OBR, and inflated in real price terms and over time. These are the costs associated with the additional public servants required to support a growing population and are the result of population changes in the economic model. They are distinct from the public sector jobs that are gained or lost as a result of spending (or cutting) the change to public finances that is calculated in the tax module.

This tax impact is not assumed to have an impact on the Northern Ireland 'block'. This is because the current Barnett formula will provide additional funding to cover services in response to the population change.

## **Transfer pricing from GB**

An estimate, provided by Treasury, is added into the calculation to account for the loss to the UK exchequer of taxes that are paid in Northern Ireland instead of GB by transferring profits to the lower tax location. Though ways of minimising these profit transfers may be explored in future, the cost is included in the model as per Treasury estimates

This tax impact is assumed to have a negative impact on the Northern Ireland PE 'block'.

## **Transfer pricing from the Rest of the World**

This effect is also taken direct from Treasury estimates but it is treated as a positive for Northern Ireland, as it is additional tax into the UK that would not otherwise have occurred.

This tax impact is assumed to have a positive impact on the Northern Ireland public finances.

### **Net costs of tax motivated incorporation**

This effect is the net impact on UK exchequer taxes from the new policy as a result of increased levels of incorporation as sole traders, the self employed or partnerships incorporate to avail of the lower tax rate. This generates lower tax income through other taxes (such as income tax) but increased corporation tax. The figures are taken directly from Treasury Consultation Document.

This tax impact is assumed to have a negative impact on the Northern Ireland 'block'.

### **Administration and compliance costs**

Similarly to the HM Treasury approach, none are included within the model. However, it is not expected that the costs of administration should be much above the overall costs that have been assumed as part of this analysis.

### 6.3 Alternative scenario results

Results of the scenario analysis carried out by Oxford Economics on behalf of EAG are presented below. The scenarios present high and low alternatives to the central case projections discussed in the main body of the report. They are based on higher and lower assumptions for annual flows of new greenfield FDI firms into Northern Ireland. They do not change any other assumptions with regard to the tax revenue 'costs' of the changes or the long term growth in FDI. They also do not change any of the behavioural relationships within the model.

- The high scenario presents an increase, equivalent to a 20% increase in FDI flows per annum to reflect a performance roughly 'half way' to the residual rates of FDI enjoyed in Singapore, (after allowing for the impact of lower wages and light labour-market regulation). Singapore is the star performer in any analysis of inward investment and taxation.
- The lower scenario is simply set as a mirror of the upper scenario and reflects roughly 20% lower FDI flows per annum. This scenario is lower than the figures for new FDI flows projected by fDi Intelligence, as part of the ongoing DETI research project.

In addition new work recently carried out by Oxford Economics suggests that a revised version of the econometric model used to estimate the key tax to FDI relationship would generate a higher level of FDI inflows than even the previous higher scenario predicted. This form of the equation, calculated using a logged dependent variable, is considered by Oxford Economics to be more accurate and suggests a higher annual inflow of jobs in new greenfield FDI firms. Employment projections, generated with this alternative equation, are included at the end of this section. In this Oxford Economic scenario, it is assumed that Northern Ireland does not have any changes to its 'block funding' outside of the corporation tax, transfer pricing and cost of incorporation effects, i.e. revenues from income tax, and National Insurance receipts accrue to the UK Exchequer and not to the Northern Ireland Assembly. This is done because this is considered a more likely outcome if such a high rate of FDI inflow is expected.

The results produced by fDi intelligence and the ongoing work may bring greater clarity over a 'preferred' approach to the estimation. There will always be a degree of uncertainty and it remains important to bear in mind that even the most conservative estimate of the future returns suggests a beneficial return on the investment, particularly if the investment 'cost' in terms of 'up-front' jobs can be mitigated against.

### High scenario additional results

**Table A.5: Annual jobs impact, high scenario**

	2010	2015	2016	2017	2018	2019	2020	2025	2030
New FDI	0	1100	1470	1500	1530	1569	1611	1892	2292
Existing firms	0	372	514	534	551	568	586	673	765
Indirect & induced	0	-379	-455	634	1217	1458	1559	2087	2882

Source: Oxford Economics

**Table A.6: Cumulative jobs impact, high scenario**

	2010	2015	2016	2017	2018	2019	2020	2025	2030
New FDI	0	2200	3670	5170	6700	8269	9880	18735	29346
Existing firms	0	728	1242	1776	2327	2895	3482	6674	10311
Indirect & induced	0	200	-255	379	1596	3054	4614	13746	26286

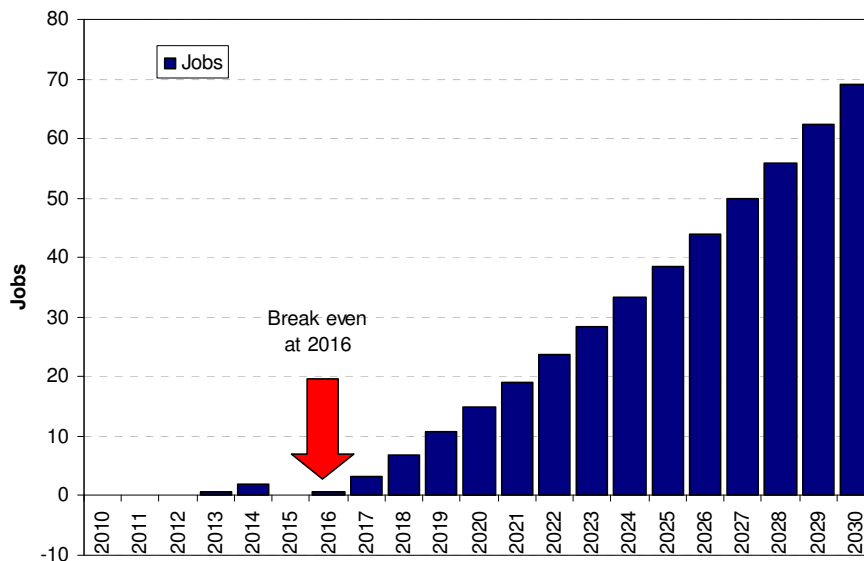
Source: Oxford Economics

**Table A.7: Average jobs and GVA growth under the high scenario, 2010-20 and 2020-30**

	Base		High	
	2010-20	2020-30	2010-20	2020-30
Average annual job growth	2110	610	3590	6030
Average annual GVA growth (%)	2.5	2.3	2.9	3.4

Source: Oxford Economics

**Figure A.5: Net Employment (cumulative), high scenario**



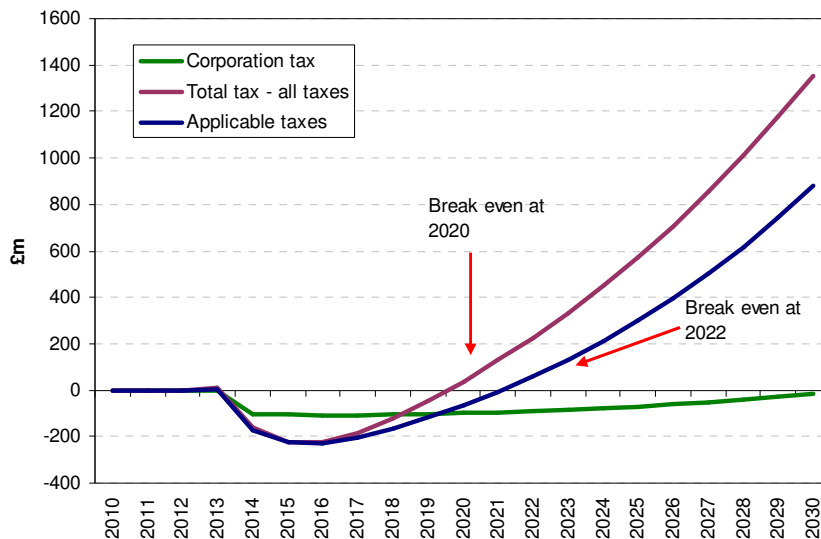
Source: Oxford Economics

**Table A.8: Tax implications, high scenario**

	2020	2030
Corporation tax	-99	-12
Income tax	8	413
Rates	43	215
National Insurance	40	321
VAT	14	98
Benefit savings	87	443
Profit shifting from GB	-56	-56
Additional public sector costs	0	-66
Total - all taxes	36	1356
Total - applicable taxes	-65	881

Source: Oxford Economics

**Figure A.6: Net tax, high scenario**



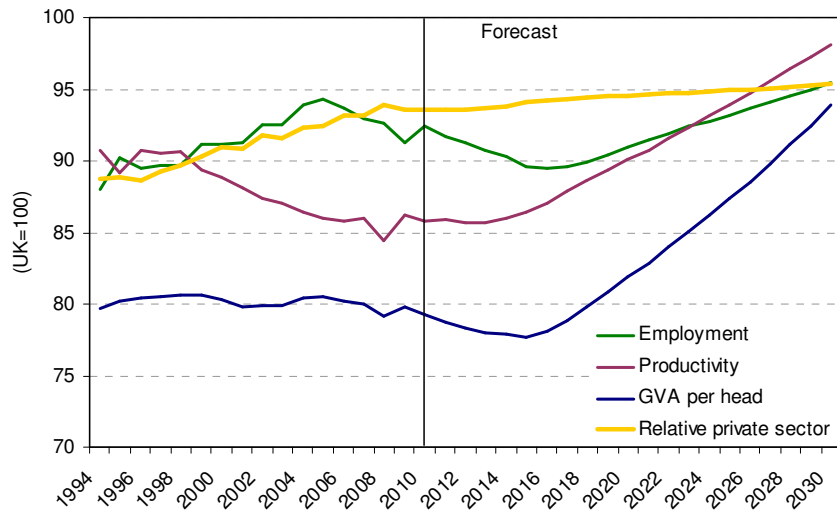
Source: Oxford Economics

**Table A.9: Summary of key metrics, high scenario differences from base**

	2020 (Dif from base)	2020 (% dif from base)	2030 (Dif from base)	2030 (% dif from base)
Population (000's)	0	0.0	9	0.5
Jobs (000's)	15	1.7	69	8.0
Exports (£m 2006)	1166	12.4	4549	40.7
Unemployment (000's)	-4	-6.9	-17	-28.4
Inactive (000s)	-9	-2.6	-36	-9.9
GVA (£m 2006)	1395	4.1	6978	16.5
Private sector employment (pp)	18	0.8	64	1.6
Private sector GVA (pp)	1519	1.2	6776	2.3
Net Executive Tax (£2006 prices)	-65	-	881	-
Net Exchequer Tax (£2006 prices)	36	-	1356	-

Source: Oxford Economics

**Figure A.7: Key relativities under high scenario**



Source: Oxford Economics

### Lower Growth Scenario

**Table A.10: Annual jobs, low scenario**

	2010	2015	2016	2017	2018	2019	2020	2025	2030
New FDI	0	740	980	1000	1020	1043	1074	1262	1528
Existing firms	0	372	514	534	551	568	586	673	765
Indirect & induced	0	-593	-796	210	810	1052	1132	1451	1938

Source: Oxford Economics

**Table A.11: Cumulative jobs impact, low scenario**

	2010	2015	2016	2017	2018	2019	2020	2025	2030
New FDI	0	1470	2450	3450	4470	5513	6587	12490	19564
Existing firms	0	728	1242	1776	2327	2895	3482	6674	10311
Indirect & induced	0	-162	-958	-748	61	1113	2244	8746	17291

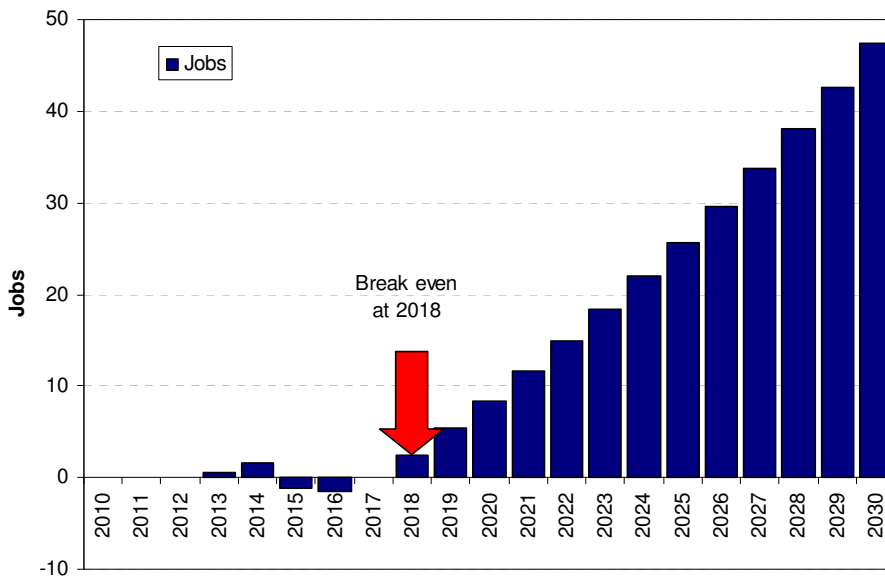
Source: Oxford Economics

**Table A.12: Average jobs and GVA growth under the low scenario, 2010-20 and 2020-30**

	Base		Low	
	2010-20	2020-30	2010-20	2020-30
Average annual job growth	2110	610	2950	4520
Average annual GVA growth (%)	2.5	2.3	2.8	3.1

Source: Oxford Economics

**Figure A.8: Net Employment (cumulative), low scenario**



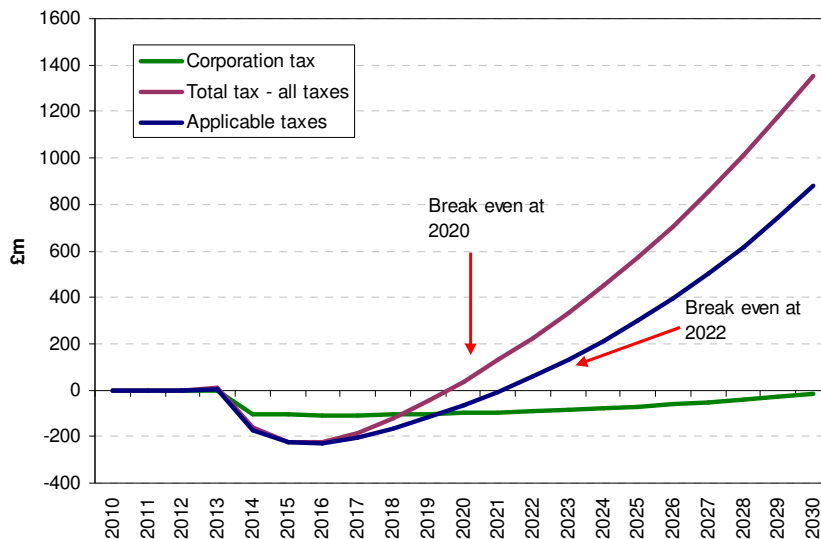
Source: Oxford Economics

**Table A.8: Tax implications, high scenario**

	2020	2030
Corporation tax	-99	-12
Income tax	8	413
Rates	43	215
National Insurance	40	321
VAT	14	98
Benefit savings	87	443
Profit shifting from GB	-56	-56
Additional public sector costs	0	-66
Total - all taxes	36	1356
Total - applicable taxes	-65	881

Source: Oxford Economics

**Figure A.6: Net tax, high scenario**



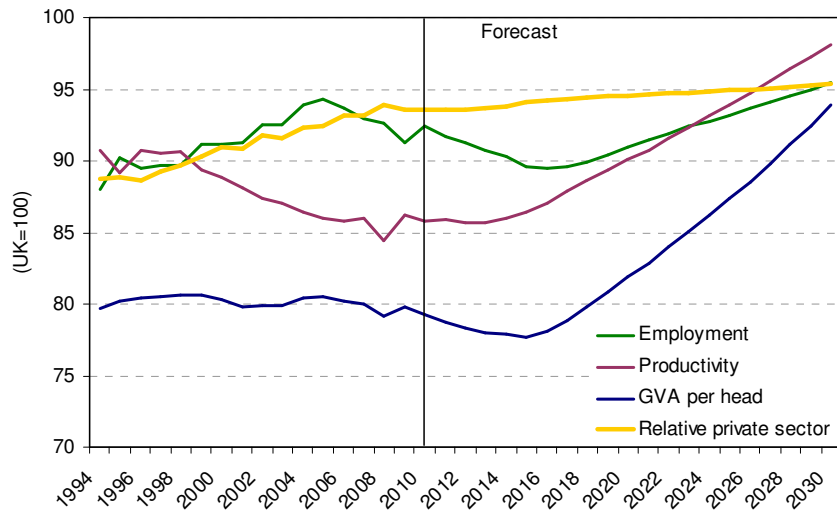
Source: Oxford Economics

**Table A.9: Summary of key metrics, high scenario differences from base**

	2020 (Dif from base)	2020 (% dif from base)	2030 (Dif from base)	2030 (% dif from base)
Population (000's)	0	0.0	9	0.5
Jobs (000's)	15	1.7	69	8.0
Exports (£m 2006)	1166	12.4	4549	40.7
Unemployment (000's)	-4	-6.9	-17	-28.4
Inactive (000s)	-9	-2.6	-36	-9.9
GVA (£m 2006)	1395	4.1	6978	16.5
Private sector employment (pp)	18	0.8	64	1.6
Private sector GVA (pp)	1519	1.2	6776	2.3
Net Executive Tax (£2006 prices)	-65	-	881	-
Net Exchequer Tax (£2006 prices)	36	-	1356	-

Source: Oxford Economics

**Figure A.7: Key relativities under high scenario**



Source: Oxford Economics

### Lower Growth Scenario

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**Table A.11: Cumulative jobs impact, low scenario**

	2010	2015	2016	2017	2018	2019	2020	2025	2030
New FDI	0	1470	2450	3450	4470	5513	6587	12490	19564
Existing firms	0	728	1242	1776	2327	2895	3482	6674	10311
Indirect & induced	0	-162	-958	-748	61	1113	2244	8746	17291

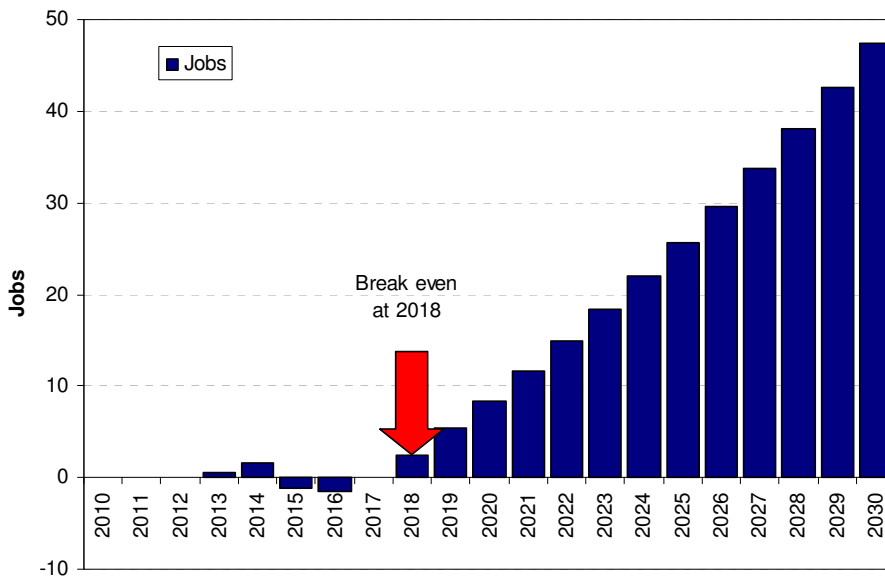
Source: Oxford Economics

**Table A.12: Average jobs and GVA growth under the low scenario, 2010-20 and 2020-30**

	Base		Low	
	2010-20	2020-30	2010-20	2020-30
Average annual job growth	2110	610	2950	4520
Average annual GVA growth (%)	2.5	2.3	2.8	3.1

Source: Oxford Economics

**Figure A.8: Net Employment (cumulative), low scenario**



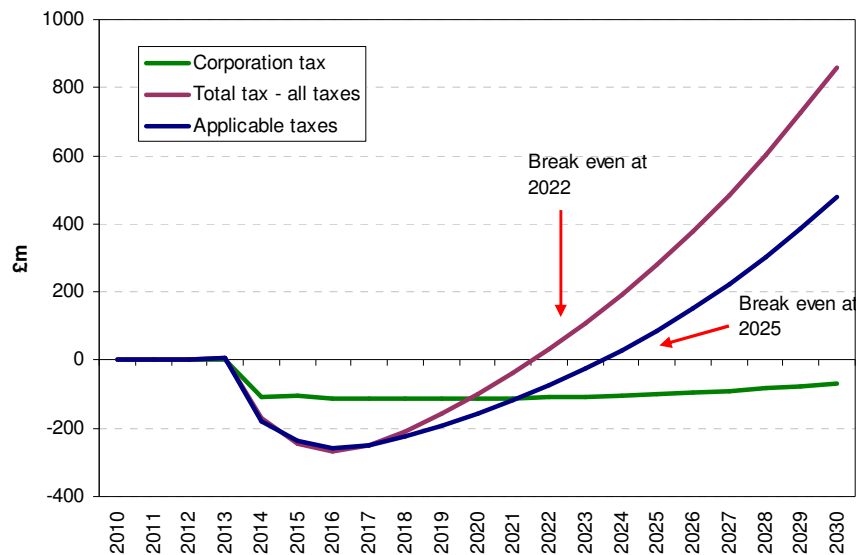
Source: Oxford Economics

**Table A.13: Tax implications, low scenario**

	2020	2030
Corporation tax	-113	-68
Income tax	-29	250
Rates	27	146
National Insurance	14	208
VAT	7	66
Benefit savings	49	326
Profit shifting from GB	-56	-56
Additional public sector costs	0	-15
Total - all taxes	-101	858
Total - applicable taxes	-158	480

Source: Oxford Economics

**Figure A.9: Net Tax, low scenario**



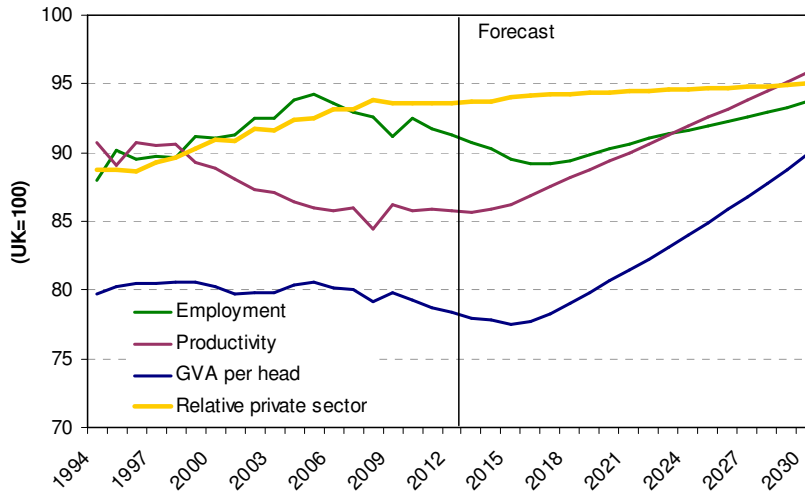
Source: Oxford Economics

**Table A.14: Summary of key metrics, low scenario differences from base**

	2020 (Dif from base)	2020 (% dif from base)	2030 (Dif from base)	2030 (% dif from base)
Population (000's)	0	0.0	2	0.1
Jobs (000's)	8	1.0	47	5.5
Inactive (000s)	-5	-1.4	-27	-7.5
Unemployment (000's)	-2	-3.9	-12	-20.9
GVA (£m 2006)	866	2.6	4743	11.2
Exports (£m 2006)	778	8.3	3076	27.5
Private sector employment (pp)	12	0.7	46	1.4
Private sector GVA (pp)	1024	1.0	4698	1.8
Net Executive Tax (£2006 prices)	-158	-	480	-
Net Exchequer Tax (£2006 prices)	-101	-	858	-

Source: Oxford Economics

**Figure A.10: Key relativities, low scenario**



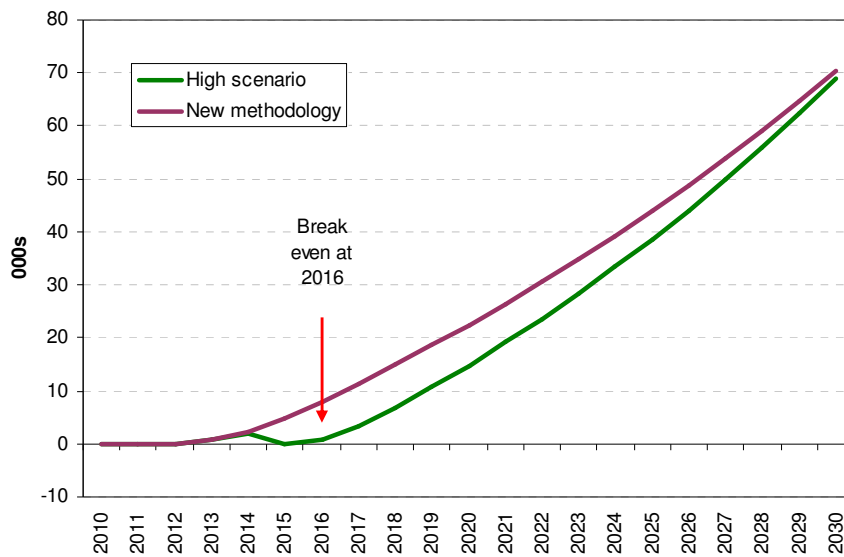
Source: Oxford Economics

### ***New Oxford Economics forecast methodology***

For illustration the chart and tables below show the results of an additional scenario prepared by Oxford Economics. This is generated using a variant form of the equation which links annual flows of jobs in new greenfield FDI firms to levels of corporation tax. In this case the dependent variable (jobs promoted per thousand population) is logged. The independent variables remain unchanged. The resulting equation gives a better fit to the data across 12 countries than the equivalent linear equation, and in OE's view is to be preferred. The number of jobs created each year in new FDI firms is 200 above the 'high' scenario by 2020 and 300 above by 2030. It is also the opinion of Oxford Economics that, in such an eventuality, it is less likely that HMT would agree to non-corporation tax tax revenues (income tax etc) being retained by the Northern Ireland Assembly. Hence in this scenario, unlike the previous scenarios, it is assumed that additional revenues from income tax, and national insurance contributions accrue to the UK Exchequer and not to the Northern Ireland Assembly - and have also assumed in this case that initial losses to Northern Ireland in tax revenues are offset through higher local rates or other local charges. This means that no public sector jobs are lost in this scenario.

The net result of higher FDI inflows, no initial public sector job losses but fewer additional public sector jobs generated by increases in tax revenues, is a level of total employment similar to that in the 'high' scenario by 2030. By 2030 the cumulative gain in total employment is close to 70,000 in both cases. Initially the gains are higher in the new scenario both because no public sector jobs are lost and because FDI inflows are a little higher. After only five years the annual level of job creation in the new scenario falls behind that in the high scenario. By 2030 the annual level of job creation is 1,000 jobs lower in the new scenario. Beyond 2030 the cumulative gains in jobs would be higher in the 'high' scenario than in this 'new' scenario.

**Figure A.11: Net Employment (cumulative), new methodology and high scenario**



Source: Oxford Economics

**Table A.15: Annual jobs, new methodology**

	2010	2015	2016	2017	2018	2019	2020	2025	2030
New FDI	0	1260	1670	1710	1750	1789	1839	2160	2617
Existing firms	0	372	514	534	551	568	586	673	765
Public sector	0	0	0	0	0	0	0	0	0
Indirect & induced	0	757	1065	1216	1276	1332	1394	1844	2436
Total	0	2389	3250	3460	3577	3690	3819	4677	5817

Source: Oxford Economics

**Table A.16: Cumulative jobs impact, new methodology**

	2010	2015	2016	2017	2018	2019	2020	2025	2030
New FDI	0	2520	4190	5900	7650	9439	11278	21385	33497
Existing firms	0	728	1242	1776	2327	2895	3482	6674	10311
Public sector	0	0	0	0	0	0	0	0	0
Indirect & induced	0	1398	2464	3679	4955	6288	7682	15829	26611
Total	0	4646	7896	11355	14932	18622	22441	43888	70419

Source: Oxford Economics