Joint Research Programme on The Macro-economy and Taxation

Annual Report for 2016

The joint research programme between the Department of Finance, the Revenue Commissioners and the ESRI on *The Macro-economy and Taxation* began in January 2015 with the objective of undertaking research on a range of macroeconomic and taxation issues in Ireland and continued through 2016. This report has been prepared on behalf of the Steering Committee for submission to the Secretary General of the Department of Finance and the Director of the ESRI to describe the work undertaken in the second year of the programme. It includes an overview of the completed projects and presentations along with associated costs. It also includes a brief overview of the proposed research for the programme's extension into 2017.

Contents:

1. Description and Progress of Research Topics:

Research Topic 1: Modelling the Implications for Ireland of UK Exit from EU

Following the vote of the UK to leave the European Union, the steering committee felt the programme should examine how this event would be likely to affect Ireland. The aim of this topic was to produce a full macroeconomic assessment of the potential impact of Brexit on the Irish economy, taking into account the full range of channels such as affects on other trading partners of Ireland, which had not previously been examined in the scoping study produced in November 2015.

This work utilised the scenarios produced by the UK National Institute of Economic and Social Research (NIESR) using their NiGEM world model, which includes detailed models of most countries in addition to the UK. NIESR has published results for three scenarios, namely an EEA arrangement, free trade and a WTO outcome, thus covering the broad spectrum of possible outcomes of a post-Brexit arrangement.

Incorporating these scenarios from NiGEM of the changed external environment into the COSMO model gave some quantification to the potential impact of Brexit. The results of the modelling exercise confirm that Ireland will be particularly badly impacted by BREXIT. Depending on the scenario considered, the fall in Irish output vis-a-vis a baseline level ranges between 2.3 and 3.8 per cent. A research paper on the results from the model simulations was released in November 2016.

Research Topic 2: Corporate Taxation and FDI

The attraction of Multinational Firms (MNCs) has been a cornerstone of Irish industrial and economic policy for almost six decades. Understanding the factors that affect investment decisions of MNCs and how such companies interact with the broader economy is therefore of fundamental concern to Irish policy makers. This is particularly the case in an environment where the taxation of international activities of companies is facing scrutiny. This research examined the role and effects of corporate tax policy on the attractiveness of Ireland and other European countries to foreign direct investment. The decision by a MNC on where to establish a new plant is the first step in a number of decisions regarding the structure of their international activities including the scale of investment in each location. Two research papers and an associated policy note were prepared on these issues.

The first paper contributed new evidence on factors determining the location choice of multinational firms across groups of EU countries with similar attractiveness characteristics. The results of this analysis were used to investigate the potential implications of changes in the United Kingdom's corporate tax policy on Ireland's attractiveness to foreign direct investment in the event of a UK exit from the EU. This policy analysis was published in the Quarterly Economic Commentary in June 2016 with the background research paper forthcoming in 2017. The second paper broadened the analysis to examine both the location decision and the size of new investment projects initiated by multinationals. A working paper was published in July 2016.

Research Topic 3: Sensitivity and Volatility of Taxes

This project aimed to provide estimates for the revenue long- and short- run elasticity of taxes with respect to changes in income in Ireland for the period 1984-2014. In general estimates of revenue elasticities are an important input into the debate on changes in the burden of taxation and are used by tax forecasting models or macroeconomic models. Work on tax elasticities under the programme covered a range of issues on different tax headings, volatility and comparative cross-country research.

- **Income taxes**

Two papers were produced on income tax sensitivities, one at an aggregate level and the other looking in more depth across different types of taxpayer type and income level.

The first paper used an econometric estimation of the elasticity for all taxpayers, controlling for discretionary tax measures and comparing how the estimates are affected by different measures of economic activity (e.g. GDP, GNP, taxable income). Across all specifications, a consistent positive relationship was found between economic activity and income tax revenues, although the choice of baseline activity did affect the magnitude. This paper is currently under review for publication in the *Economic and Social Review.*

The second paper used an analytical approach to the estimation of tax elasticities (known as the Creedy-Gemmell approach). This research is at a more granular level, providing estimates of how elasticities vary across time, type of taxpayer and income level. The results show that thresholds and tax credits are more important than tax rates in determining the automatic growth of the income tax system. Accounting for the differing growth rates in income across the income distribution gives a considerable boost to the elasticity estimate, as higher earners typically experience faster income growth than the rest of the economy and also pay the most taxes. Adding credits or reliefs also increases the elasticity. This work was published as an ESRI research report in 2017.

- **Tax volatility**

The next research paper in this broad area examined the volatility of different types of taxes and presented a portfolio analysis of tradeoffs between the return and variability of tax sources. This paper examined the presence of an "optimal" tax mix exists by comparing the current distribution of tax revenues to a hypothetical structure based on mean-variance portfolio theory in order to frame a discussion of how the tax system balances revenue maximisation against stability of revenues across the business cycle. The co-variance of the different tax headings over time was found to play a crucial role in the extent to which these two objectives can be jointly pursued or can offset one another. The analysis suggested that a significant improvement of average total taxation revenue growth to its volatility could have been achieved in recent years if a greater proportion of taxation revenue came from direct (income tax) as opposed to indirect (value added tax) sources. This work was released as an ESRI working paper and submitted for potential publication in the journal *Economics Letters.*

- **Expenditure taxes**

Expenditure taxes are one of the major contributors to total government revenue. This research used the Creedy-Gemmel analytical technique (as applied to income taxes in previous work) to measure the sensitivity of VAT revenues to economic activity. In order to do so, individuals' net incomes are computed by using data on the relevant budget shares, income and consumption tax parameters, after distinguishing between goods with different indirect tax rates. The elasticity has been computed firstly for the several different groups of consumer goods subject to different levels of indirect tax and are then weighted and aggregated into one value of the elasticity for each year. Final publication of this paper will be in 2017 to allow the addition of new household budget data.

- **Comparative tax elasticities**

To place the tax elasticities across all of the broad tax headings in Ireland into context, this paper calculated elasticities for each tax headings using data on Ireland and on a range of other OECD countries. Similarly to the work on income tax, this included an examination of the sensitivity of the estimates to the use of different measures of economic activity and controls for discretionary tax changes to isolate the long-run elasticity. The work will be published in early 2017.

Research Topic 4: Household Wealth and Wealth Tax Design

The research under this heading used recently available information on the composition of household assets and liabilities to examine the impact of a tax on household wealth in Ireland under a wide range of assumptions on how such a tax might be designed. The scenarios used were based on models of existing taxes on household wealth across Europe and a number of hypothetical tax designs structured to illustrate how the results are affected by varying qualifying thresholds or asset exemptions.

The paper produced revenue estimates and calculations for the percentage of households that would be liable for different qualifying thresholds, tax rates and exemptions for specific assets, such as the household main residence and farms, for each scenario. In addition, the distributional impact was assessed by examining the characteristics of affected households in terms of their income decile and demographic characteristics. A central finding of the paper was that, due to the imperfect correlation between income and wealth, a non-negligible proportion of the tax would be collected from households in the lowest income deciles in all but the most narrowly targeted tax scenario.

The work on household wealth distributions and the potential impact of different wealth tax scenarios was published as a working paper in November and presented at the Department of Finance's tax conference "Enhancing Tax Policy with Evidence".

Research Topic 5: Study on Cross Border Fuel Tourism

With differential prices of motoring fuels between Ireland and Northern Ireland as well as exchange rate variations there is often an incentive to purchase motoring fuels across the Border. Over recent years the price differences have been favourable for motorists from Northern Ireland to purchase motoring fuel in Ireland. This study assesses the scale of this so called cross border fuel tourism using a unique new dataset that has been collected by the Revenue Commissioners under the Return of Oil Movements (the ROM1), which was introduced from 1st January 2013. This data consists of monthly returns on sales, purchases and stock of fuels by type for registered traders and distinguishes retailers from wholesalers. Importantly, the data includes the location of forecourts. This is being used to identify the distance from the Border along with other market measures such as market size and local competition.

The analysis consisted of the estimation of econometric models, using simple panel data estimators in the first instance and subsequently stochastic frontier analysis to identify the level of sales of fuel (by type) across forecourts given the individual and market characteristics. This allowed for the identification of greater sales along the border which can then be used to determine the level of fuel tourism. Following considerable work on data preparation, initial results were presented to the steering committee at its September meeting and a final paper was released early in 2017.

2. Outputs in 2016 (including forthcoming publications)

Research Papers and Publications published in 2016/2017

- Adele Bergin, Abian Garcia Rodriguez, Niall McInerney, Edgar Morgenroth and Donal Smith *Modelling the Medium to Long Term Potential Macroeconomic Impact of Brexit on Ireland,* ESRI Working Paper No.548.

- Kieran McQuinn and Maurice Roche, *Efficient frontiers and fiscal stability: An ex-ante and ex-post application to the Irish public finances* – ESRI Working Paper No.538 and under review at the journal *Economics Letters.*

- Yota Deli, Derek Lambert, Martina Lawless, Kieran McQuinn and Edgar Morgenroth, *How sensitive is Irish income tax revenue to underlying economic activity?* – ESRI Working Paper No.540 and under review at the *Economic and Social Review.*

- Martina Lawless and Donal Lynch *Scenarios and Distributional Implications of a Household Wealth Tax in Ireland*, ESRI Working Paper No.549 (November 2016)

- Ronald Davies, Iulia Siedschlag and Zuzanna Studnicka, *Corporate Taxation and Foreign Direct Investment in EU Countries: Policy Implications for Ireland*, ESRI Quarterly Economic Commentary Special Article, June 2016.

- Ronald Davies, Iulia Siedschlag and Zuzanna Studnicka, *Corporate Taxation and Foreign Direct Investment: Empirical Analysis of Extensive and Intensive Margins of Investment Decisions,* ESRI Working Paper No.537, July 2016.

- Jean Acheson, Yota Deli, Derek Lambert and Edgar Morgenroth, *Income Tax Revenue Elasticities in Ireland: An Analytical Approach* ESRI Research Report No.59, March 2017.

- Sean Kennedy, Sean Lyons, Edgar Morgenroth and Keith Walsh *Assessing the Level of Cross-Border Fuel Tourism* MPRA Working Paper No. 76961, February 2017.

Research Papers and Publications to be released in 2017

- Jean Acheson, Yota Deli, Martin Murphy and Edgar Morgenroth, *Expenditure Tax Revenue Elasticities in Ireland: An Analytical Approach*.

- Yota Deli, Kieran McQuinn and Edgar Morgenroth, *Tax Elasticities in Comparative Context.*

- Ronald Davies, Iulia Siedschlag and Zuzanna Studnicka, *Corporate Taxation and Foreign Direct Investment in EU Countries*.

Presentations, Conferences and Communications

Date	Item	Details
March 2017	German Institute for Economic Research (DIW) seminar	Ron Davies, Iulia Siedschlag and Zuzanna Studnicka "Corporate Taxation and Foreign Direct Investment in EU Countries"
November	Department of Finance conference "Enhancing Tax Policy with Evidence"	Jean Acheson, Yota Deli and Edgar Morgenroth "Tax Volatility: Implications of Tax Base Growth for Tax Revenue"
November	Department of Finance conference "Enhancing Tax Policy with Evidence"	Ronald Davies and Iulia Siedschlag "Corporate Taxation and FDI: Implications for Tax Policy"
November	Department of Finance conference "Enhancing Tax Policy with Evidence"	Martina Lawless and Donal Lynch "Household Wealth in Ireland and the Potential Impact of a Wealth Tax"
November and April	Seminars in Department of Finance	Ronald Davies and Iulia Siedschlag "Corporate Taxation and FDI: Implications for Tax Policy"
November	Seminar in Department of Finance	Martina Lawless and Donal Lynch "Household Wealth in Ireland and the Potential Impact of a Wealth Tax"
November	Seminar in ESRI	Martina Lawless and Donal Lynch "Household Wealth in Ireland and the Potential Impact of a Wealth Tax"
April	Society for International Trade Theory conference, UCD	Zuzanna Studnicka "Corporate Taxation and FDI in EU countries: Implications for Tax Policy"
April	Society for International Trade Theory conference, UCD	Ron Davies "Effect of Taxes on FDI's Intensive and Extensive Margins
April	Presentation at University of Geneva	Ron Davies "Effect of Taxes on the Intensive and Extensive Margins of FDI"
May	Presentation at ETH Zurich	Ron Davies "Effect of Taxes on the Intensive and Extensive Margins of FDI"

Media Coverage (Selection)

Irish Times (7/11/16): "Economic impact for us after Brexit will be 'severe', warns report"
Irish Times (7/11/16): "Brexit effect expected to shrink economy by nearly 4%"
Irish Times (7/11/16): "Businesses looking beyond sterling at supply chains"
Irishtimes.com (17/6/16): "Taxing issues: ESRI sets out likely impact of changes to Ireland's corporate tax rate"
Irish Examiner (16/6/16): "FDI success doesn't mask need to build domestic industry"
Irishtimes.com (14/6/16): "Ireland vulnerable to corporation tax changes in seeking FDI"
Irish Times (14/6/16): "Corporate tax rate critical for Ireland"
Rte.ie (17/6/16): "Brexit could make Ireland more attractive to investors"
Businessworld.ie (14/6/16): "Competitive corporate tax rate is a strong factor in attracting FDI to Ireland"
Irish Times (24/11/16): "Imposing French-style wealth tax would only yield €22million"
The Times (22/11/16): "Doubts raised over left-wing wealth tax"

3. Proposed work for 2017

The initial term of the research programme was for two years and it was decided in November 2016 to extend this for a further one year. A range of new topics have been proposed for the 2017 work plan:

- Estimation of the excess burden of taxation;
- Implications of Brexit for customs;
- Productivity measurement and the national accounts;
- Carbon tax – impacts and pricing policies;
- Firm-level productivity and diffusion;
- Macro and micro impacts of tax instruments.

Detailed terms of reference will be prepared for each topic for discussion and approval by the Steering Committee throughout the year.

4. Budget 2016

	Cost per project
Brexit	€34,996
Income tax	€65,240
VAT	€26,046
Other taxes	€66,125
Wealth	€26,900
Oils	€32,280
FDI	€33,092
Total	€284,679