

Export Structure, FDI and the Rapidity of Ireland's Recovery from Crisis

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Abstract: The FDI-intensity of the Irish economy has been a frequent topic of contributions to *The Economic and Social Review* over the years. The paper begins by reviewing the FDI-related distortions that complicate the measurement of Irish economic performance. It then extends the analysis to discuss how these might affect the identification of the factors behind the strength and rapidity of the recent recovery. The measures underlying the 'internal devaluation' perspective are shown to be infected by these same distortions. The asymmetric characteristics of the Irish economy are argued to require that greater attention be paid to export structure than is standard in textbook macroeconomic analysis.

I INTRODUCTION

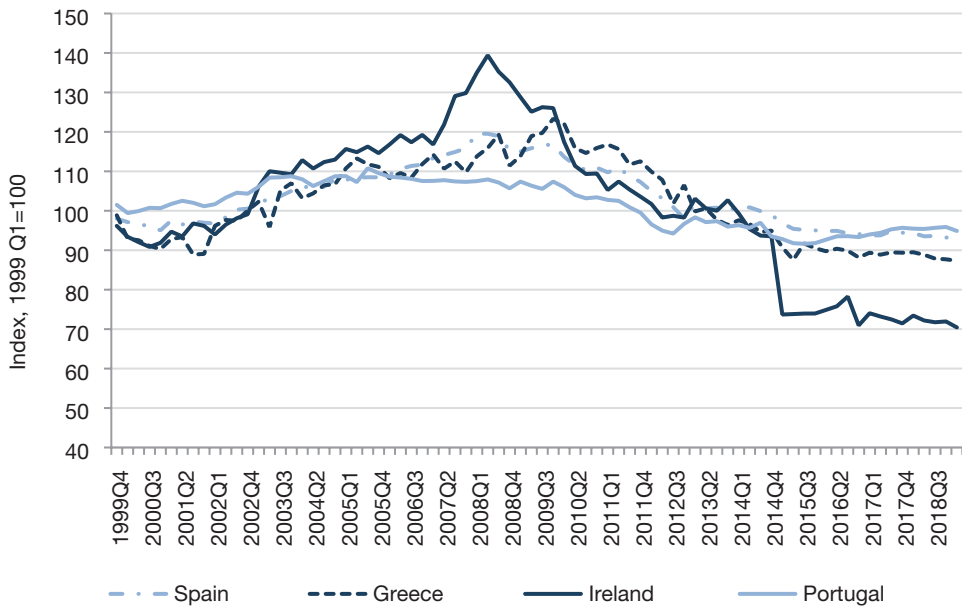
Along with the other Eurozone 'cohesion countries' of Greece, Spain and Portugal, Ireland suffered a massive downturn over the course of the twin financial and Eurozone crises of 2008-2010. In the Irish case this followed almost two decades of exceptional growth that had seen the country converge and ultimately overtake average Western European living standards. The precariousness of the public finances in each of the crisis-stricken states necessitated substantial pro-cyclical budgetary consolidation.

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Each had been in a position of Balance of Payments deficit throughout the new millennium so the macroeconomic imbalances showed up as a problem of real exchange rate overvaluation. Since currency devaluation was impossible given the commitment to continued Eurozone membership, the prescribed policy response was a reduction in relative production costs or *internal devaluation*. The outcome in all four cases, based on developments in economy-wide relative unit labour costs, is as depicted in Figure 1.

Figure 1: Real Harmonised Competitiveness Indicator (Deflated by Whole-Economy Unit Labour Costs)



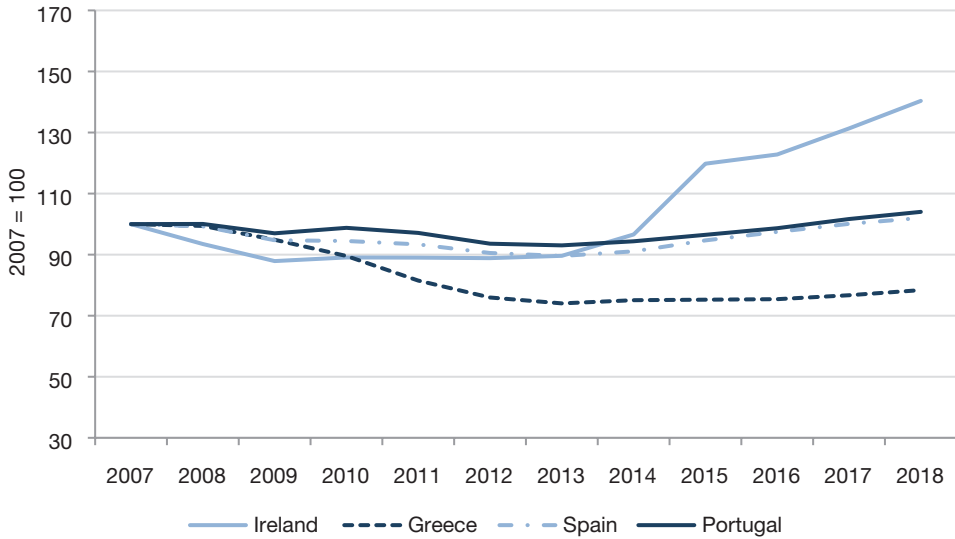
Source: European Central Bank.

Note: A decline in the index indicates an improvement in competitiveness.

The internal devaluation analysis holds that the more rapid the realignment in costs, the more rapid the recovery is likely to be. Ireland's competitiveness gain over the recovery period, based on the measure above, was far more dramatic than that achieved by the other cohesion economies, which is consistent with the massive differences in developments in GDP per capita between Ireland and the other comparator countries (Figure 2).

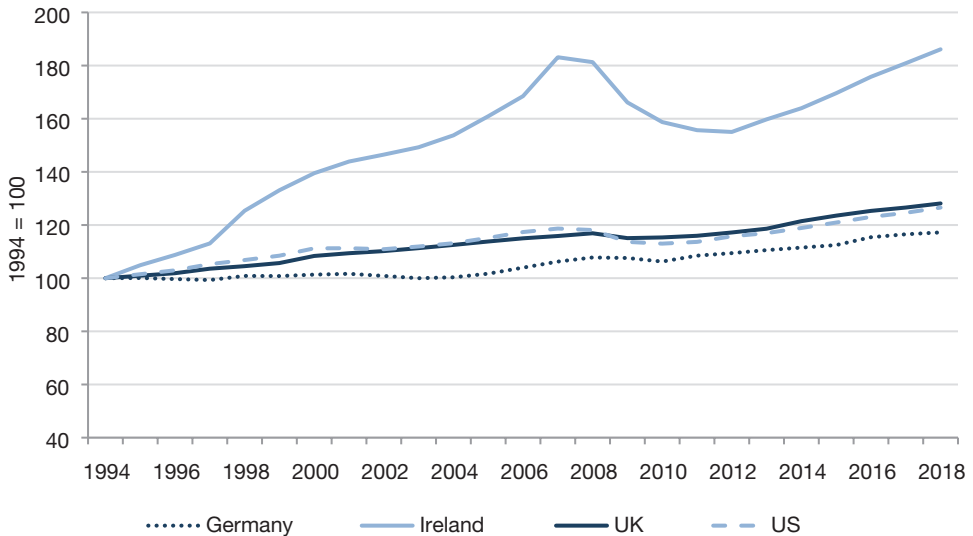
It has long been recognised of course that the FDI-intensity of the economy complicates the measurement of Irish national income. The Irish recovery continues to stand out however even by the adjusted national income measures discussed in Section II. It is less widely recognised that the unit labour cost measures underlying the 'internal devaluation' analysis are also distorted by these same features of the

Figure 2: Real GDP Per Capita, 2007=100



Source: Eurostat.

Figure 3: Total Employment, 1994=100



Source: OECD.

Irish economic landscape. The stark differences in competitiveness performance disappear when these distortions are adjusted for, as in Section III. This reopens the question of how the dramatic differences in the speeds of recovery are to be accounted for.

Krugman (1997) notes that regional analysis focuses attention on an economy's 'export base' and argues that the high degree of openness of the Irish economy – in terms of labour flows as well as trade – suggest that it might usefully be modelled as a region rather than as a textbook national economy. Since capital and labour flows reinforce each other in the regional case, such economies can grow and contract – and, under appropriate circumstances, recover – more rapidly than textbook national economies (Krugman, 1993). The relative amplitude of employment cycles in Ireland and in Germany, the UK and the US over recent decades is illustrated in Figure 3.

An undue emphasis on exports can nevertheless overstate the contribution of the foreign-owned sector since the domestic value-added share in Irish gross exports is relatively low (Byrne and O'Brien, 2015). A conventional growth accounting framework on the other hand, it will be argued, can understate its contribution. These issues are addressed towards the end of the paper.

II THE FDI-INTENSITY OF THE ECONOMY AND THE MEASUREMENT OF RECOVERY

Profit repatriation – a consequence of the unusually strong presence of foreign MNCs in the economy – has driven a large and growing wedge between Irish GDP and GNP, with the latter declining as a share of the former from 89 per cent in 1995 to 79 per cent in 2017. For most countries these aggregates can be used interchangeably when measuring income or productivity. Extra care needs to be taken in the Irish case. The measurement of productivity is discussed in the next section; the focus here is on national income.

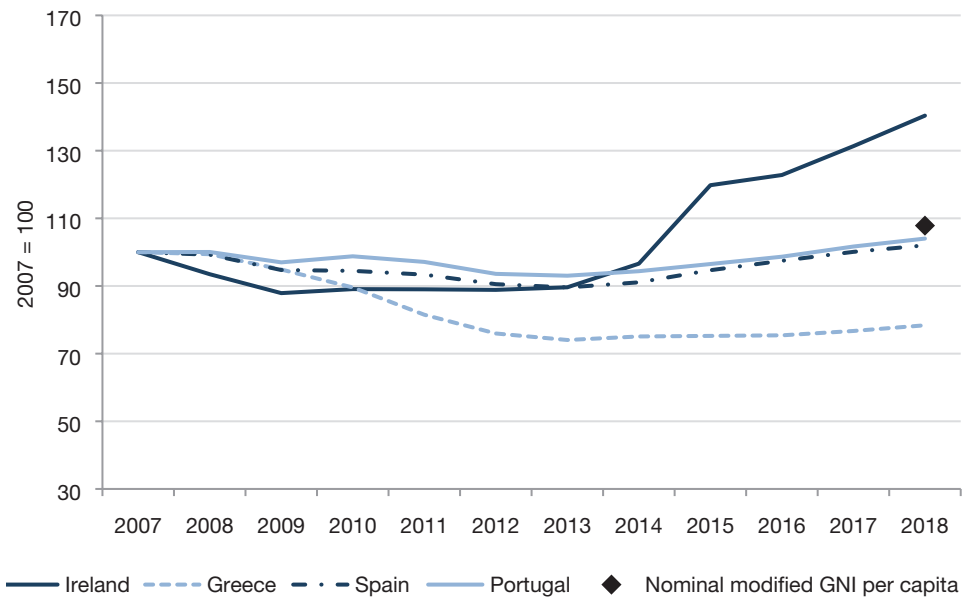
GDP clearly exaggerates the recovery. More recently, Irish GNP and GNI have also been obscured by developments relating to contract manufacturing, redomiciling, international aircraft leasing and the international location of R&D assets.¹ These developments were reflected in revisions to the National Accounts which saw measured GDP and GNP rise by 26 per cent and 19 per cent respectively *in a single year*. In July 2017 the Central Statistics Office released a new 'modified Gross National Income' series (GNI*) that strips out the factor income of re-domiciled companies as well as depreciation on aircraft leasing and R&D-related

¹ Contract manufacturing arises when an Irish-based firm engages a company located elsewhere to manufacture on its behalf. As Purdue and Huang (2016) explain, ownership of the items produced is vested in the Irish firm until sold, at which point they are recorded as exports, even though they have not been produced in Ireland. On the National Accounts implications of re-domiciling (or corporate inversion) see FitzGerald (2013); similarly, on the movement of intellectual property assets, see McNamara and MacCoille (2016). The OECD's 'base erosion and profit shifting' (BEPS) initiative appears to have triggered a shift in IP assets from micro states such as the British overseas dependencies to low-tax countries like Ireland where product development can take place (Mutti and Grubert, 2009). Depreciation of these assets, which can occur rapidly, is not of course stripped out in determining Gross National Income.

intellectual property imports. These adjustments reduced the value of measured GNI by almost 20 per cent (Central Statistics Office, 2017, Annex 1).

Developments in the aggregates GDP and GNI* over recent years are charted in Figure 4. GNI* reduces dramatically the apparent pace and extent of the Irish recovery but the resilience of the economy is underpinned nevertheless by the comparative evolution of employment in the four cohesion countries (Figure 5).

Figure 4: Real GDP (and GNI*) Per Capita, 2007=100



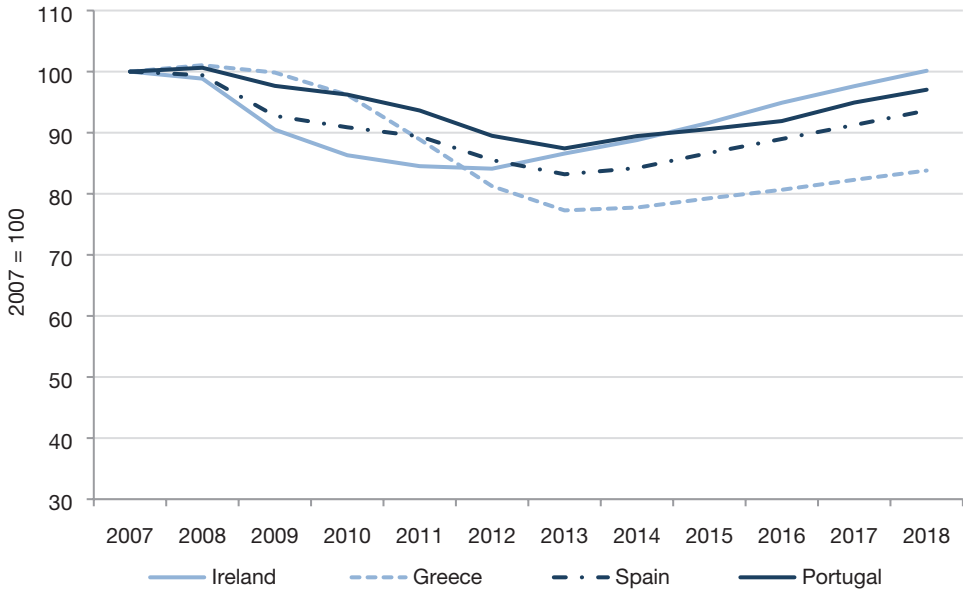
Source: Eurostat and CSO.

III PRODUCTIVITY AND THE MEASUREMENT OF COMPETITIVENESS

The share of foreign affiliates in Irish value-added far exceeds their share in employment. At the sectoral level the gaps are particularly large in foreign-dominated sectors such as pharmaceuticals and information and communications services.² Eurostat data reveal few such large discrepancies elsewhere in the EU. Measured productivity however is widely considered to be distorted by MNC transfer pricing practices involving the assignment to Ireland of returns on patents largely derived from R&D conducted elsewhere. As Desai *et al.* (2006) point out:

² These patterns are confirmed by Siedschlag *et al.* (2017), who make use of confidential microdata from the CSO to disaggregate the data by firm ownership.

Figure 5: Employment, 2007=100



Source: OECD.

OECD governments require firms to use transfer prices that would be paid by unrelated parties, but enforcement is difficult, particularly when pricing issues concern differentiated or proprietary items such as patent rights. Given the looseness of the resulting legal restrictions, it is entirely possible for firms to adjust transfer prices in a tax-sensitive fashion without violating any laws.

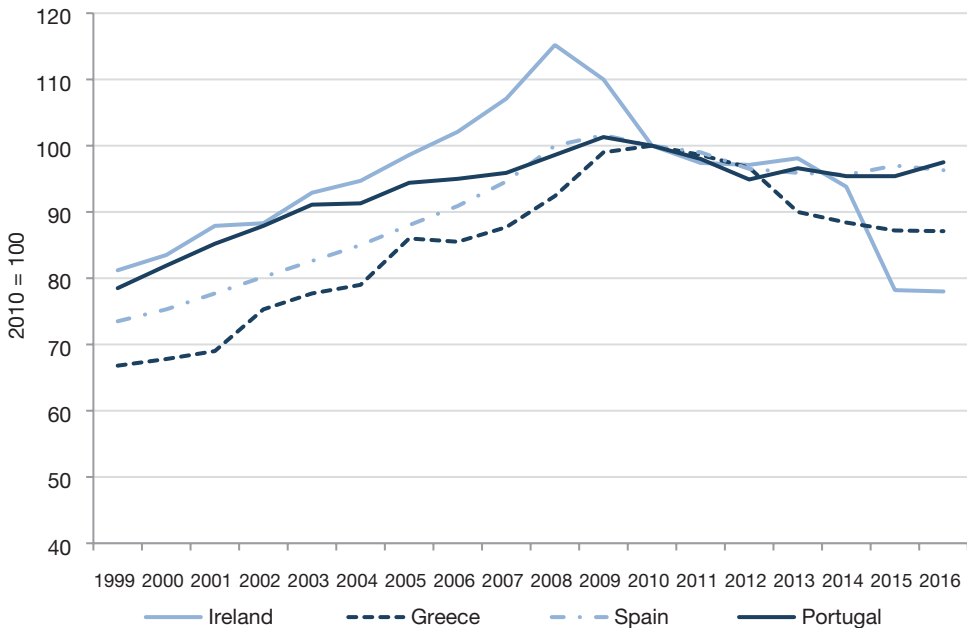
This suggests that conventional measures of Irish productivity are artificially high (Crafts, 2014; O’Leary, 2015).³

Competitiveness is commonly measured in terms of unit labour costs, where productivity improvements are balanced against wage increases. Figure 6 depicts developments in *nominal* unit labour costs over time. (This measure is easier to break down into its component parts than the unit labour cost measures shown earlier). Ireland’s apparent competitiveness gains since 2008 are again more dramatic than those achieved by Greece, Spain or Portugal. In Ireland, from the peak in 2008, nominal unit labour costs have fallen by 32 per cent. However the change in nominal compensation per employee over the time period was only 2.5 per cent while the change in real GDP per person employed (i.e. in productivity)

³ Further measurement problems arise if productivity *growth* is also artificially high. Siedschlag *et al.* (2017) show that the productivity gap between Irish and foreign non-EU firms in both manufacturing and services has been increasing over time.

was 51 per cent. Simple decompositions reveal that the productivity impacts are very large in manufacturing, information and communications and in professional, scientific and technical activities. Such anomalies are not present in the data for the other countries.

Figure 6: Nominal Unit Labour Costs, 2010=100



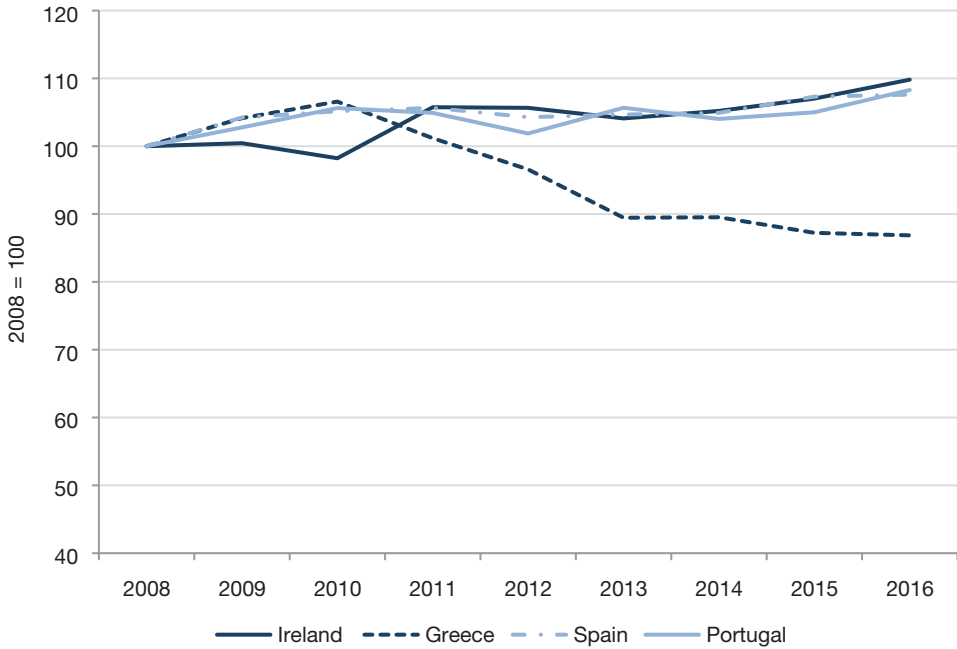
Source: Eurostat.

Focussing on the wage component of the competitiveness indicators reveals a very different picture. Figure 7 shows compensation per hour worked in Ireland, Greece, Spain and Portugal. This indicator fell slightly in Ireland over the 2008 to 2010 period whereas it increased in the other countries; however it recovered quickly and its trajectory in more recent years is broadly similar to that in Spain and Portugal.

O'Brien's (2010) analysis of the various competitiveness measures concludes that:

developments in the [broad] chemicals sector in particular have tended to drive up measures of productivity growth and push down unit wage costs to such an extent as to reduce the relevance of output-weighted measures given the relatively small weight of the chemicals sector in manufacturing employment.

Similar issues arise with respect to foreign-owned internationally traded services.

Figure 7: Nominal Compensation Per Hour

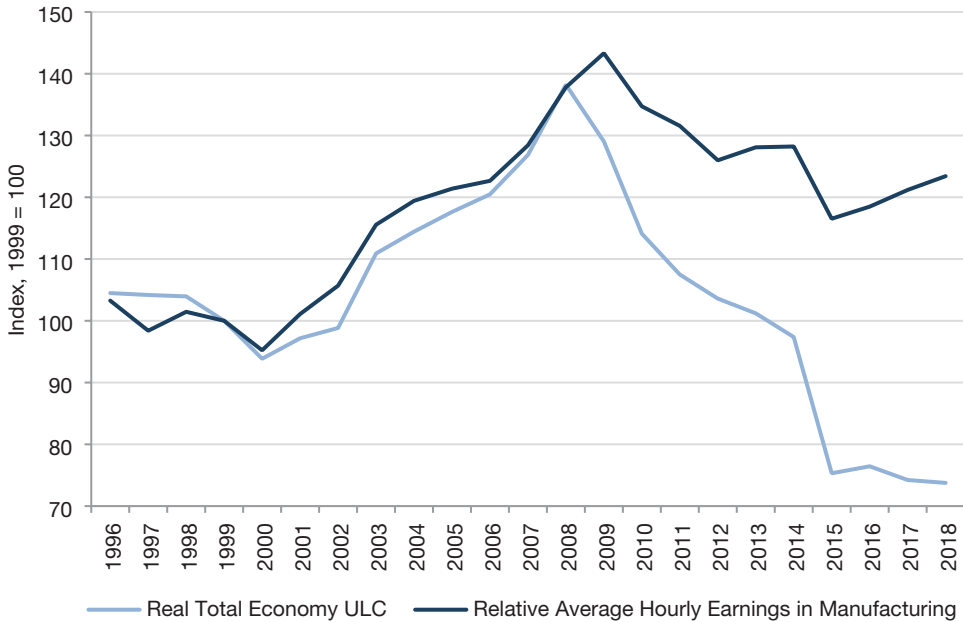
Source: Eurostat.

Further distortions can be caused by cyclical shifts, which, as seen in Figure 1, can be particularly pronounced in Ireland. Thus part of the improvement in the economy-wide productivity figures charted earlier occurred through a shift out of lower productivity sectors such as construction and non-traded services over the course of the downturn. Labour costs, furthermore, are based on compensation *per employee* rather than compensation *per hour* (as is more appropriate in the measurement of competitiveness). The former fell much more dramatically than the latter during the recession because of the fall in hours worked (O'Brien and Scally, 2012, Table 2), further overstating the gain in competitiveness.⁴

For these various reasons analysts such as Brendan Walsh and Patrick Honohan invariably chose not to adjust for productivity changes. Their preferred measure of competitiveness was an inverse index of 'relative hourly manufacturing earnings in a common currency' (see e.g. Honohan and Walsh, 2002). Figure 8 shows that the competitiveness gain indicated by this measure is very much less than the unit labour cost measures that underlie the 'internal devaluation' perspective.

⁴ For a fuller analysis of these issues see Barry (2017).

Figure 8: Competitiveness Indicators Compared: Whole-Economy Unit Labour Costs vs. Relative Average Hourly Earnings in Manufacturing



Source: Relative Average Hourly Earnings: unpublished data, Central Bank of Ireland. Real Total Economy Unit Labour Costs: ECB.

IV THE REGIONAL ECONOMY PERSPECTIVE AND THE EXPORT BASE

Pollard (1981), in his classic study of European industrialisation, suggested that Ireland's exceptional openness to international trade and factor flows implied that in considering long-term development problems and prospects, the country might be best thought of as a region of a broader encompassing economy. Krugman (1997) notes that in such cases economists look at:

the industries that sell to customers outside the region itself... The rest of the local economy in effect exists to serve that export base.. Thus if Boston is successful in capturing a pre-eminent position in say biotechnology this will draw in skilled workers in that industry, and indirectly draw in workers to provide services to those biotech workers, and to each other.

When trying to forecast or explain economic performance, he continues, macroeconomics provides the appropriate framework in the case of textbook

national economies, while in the case of regions, “we tend to ask questions about industry structure.”

Blanchard’s (2002) suggestion that the Celtic Tiger phenomenon be viewed through the lens of the AK endogenous growth model bears similarities to the regional-economy perspective. Unlike in the case of the classic Solow model of convergence theory, in neither of these alternative models is labour a constraining factor.⁵ Blanchard (2002) mentions the shift towards the more capital intensive goods produced by the foreign-affiliate sector as a possible trigger for the Irish boom, a hypothesis which receives empirical support from Romalis (2007), who considers the establishment of the Single Market as an important factor in these developments. The Single Market, which is likely to have strongly affected the foreign MNC sector, does not feature in the Honohan and Walsh (2002) analysis of the Celtic Tiger growth phase on which Blanchard was commenting.

To be consistent with the bubble economy which directly preceded the crash of 2008-2010, a more fully articulated model must leave room for crowding-out to occur. Such a model might treat the real wage (i.e. the nominal wage relative to the Consumer Price Index) as determined by conditions in overseas labour markets, and hence exogenous.⁶ The domestic labour market then adjusts via migration, and recovery prospects depend more on the characteristics of the ‘export base’ than on wage flexibility. Some crowding-out of the traded sector can nevertheless occur.⁷

The demand for non-tradeables in the model that underlies our analysis is a function of the export base, the relative price of non-tradeables, expectations and the debt burden/interest rates:

$$D_{NT} = D_{NT}[\text{Export base}; P_{NT}/P_T; \text{Expectations}; \text{Debt Burden}]$$

This model leaves open a channel for austerity or internal devaluation to facilitate recovery and allows room too for other mechanisms identified by FitzGerald and Lane (2017) to have been of significance. They argue for example that the Irish strategy of “under-promising and over-delivering” had beneficial expectational effects while Ireland’s conduct of financial policy, which differed from that of the other cohesion countries, led to substantial savings in interest payments. Expectations furthermore explain how a turnaround in the fortunes of the traded sectors can lead to a more than proportionate increase in demand across the rest of the economy, counteracting the drag of debt on aggregate spending.

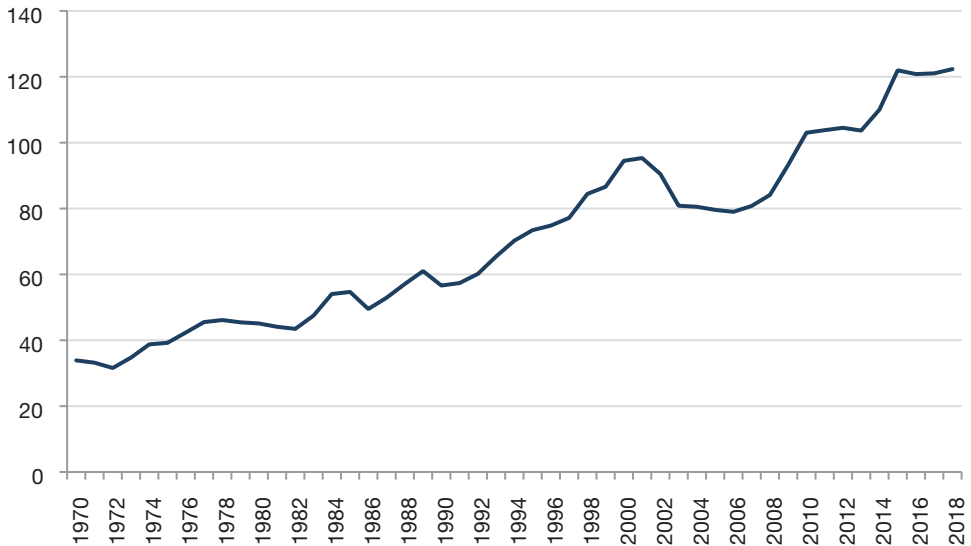
⁵ Steady-state productivity in the Solow model is tied down by the labour force, while output in the AK model rises in line with capital accumulation (Jones, 1998: pp. 148-152).

⁶ The ‘pure’ regional-economy model with a perfectly elastic labour supply curve allows no room for divergences between the home and foreign real wage. The model is extended by Barry and Devereux (2006) to allow for an imperfectly open labour market.

⁷ If the Consumer Price Index is a unit-elastic function of traded and non-traded goods prices then an increased demand for non-tradeables causes w/p_{NT} and w/p_T to move in opposite directions, leading to an expansion in non-tradeables and a contraction in the traded sector.

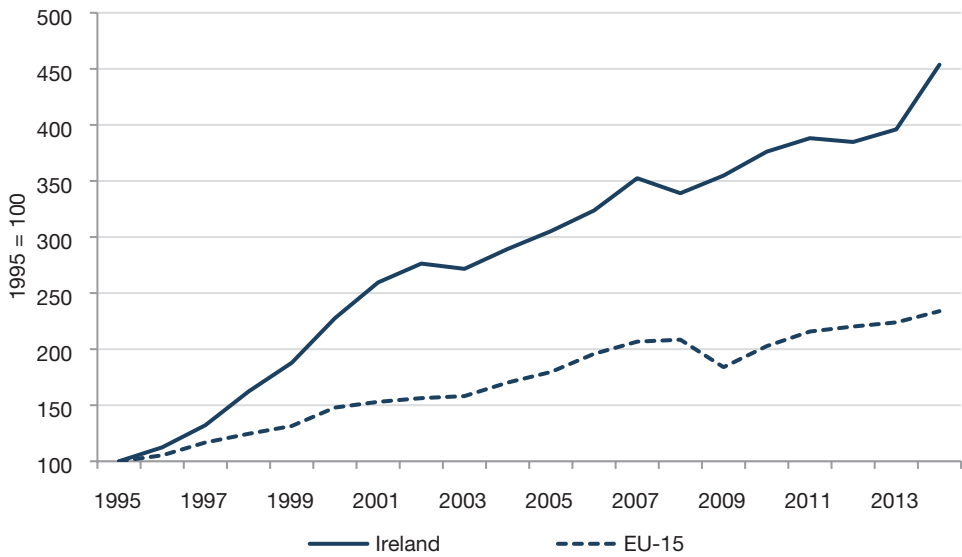
Two further points might be noted before we turn our attention to the specifics of the Irish export base. The first is that Ireland's high trade orientation cushions it to some extent from the effects of fiscal consolidation (for standard textbook reasons). The second is that when viewed against the backdrop of developments from the early 1990s, the anomalous era is the 'bubble economy' of the new millennium rather than the recovery period.⁸ Exports have expanded as a share of the economy other than during the bubble period (Figure 9) while continuing to grow more rapidly than in the case of the EU15 (Figure 10) – even when GDP is used as denominator. The bubble-era deterioration in the Balance of Payments represents another key interlude between the growth and recovery periods (Figure 11).

Figure 9: Exports as a Share of Irish GDP

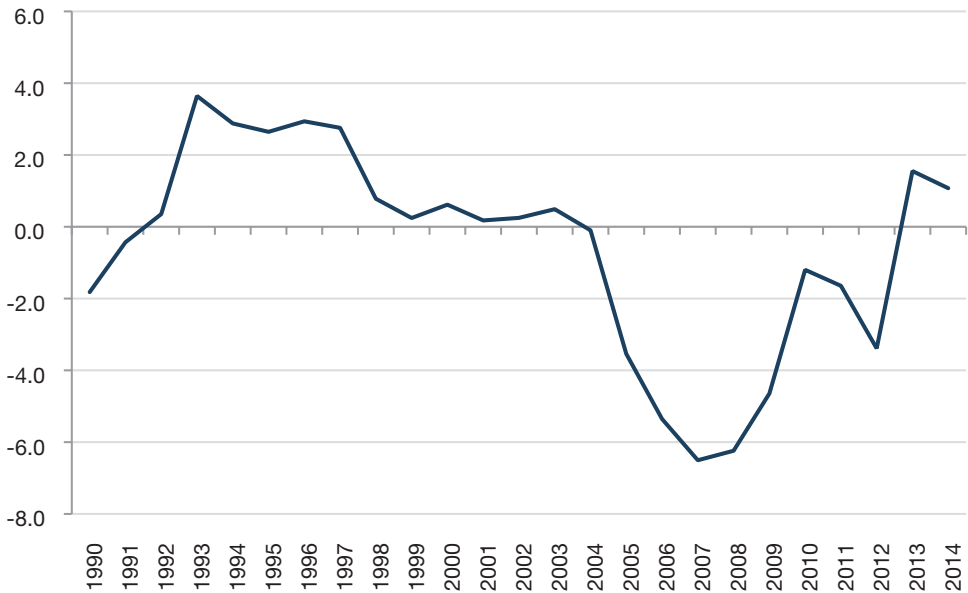


Source: CSO, current price data.

⁸ Whelan (2014) determines that there was little further scope for convergence by the time the crash occurred. Crafts (2014) shows that the convergence gap is much more substantial when proxied by GNP per hours worked, which is his preferred measure, than by GDP per worker, the measure employed by Whelan. The gap will be more substantial again if GNI* is used in place of GNP.

Figure 10: Growth in Irish and EU15 Exports, 1995=100

Source: Eurostat, constant price data.

Figure 11: Balance of Payments on Current Account (Share of GDP)

Source: CSO.

We turn now to the characteristics of the Irish export base. The foreign multinational sector accounts for a much higher share of exports than it does of employment. Whether artificially inflated or not, these foreign-affiliate exports have substantial backward linkages – as seen in Table 1 – which help to sustain the economy, particularly in times of recession.⁹

Table 1: Backward Linkages, Indigenous and Foreign Export Industries, 2015 (€ million)

	<i>Manufacturing</i>		<i>Services</i>	
	<i>Indigenous</i>	<i>Foreign</i>	<i>Indigenous</i>	<i>Foreign</i>
Payroll costs	3,677	5,571	2,848	4,963
Irish materials purchased	8,814	2,586	570	1,935
Services sourced in Ireland	2,227	2,936	1,588	2,827

Source: Department of Business, Enterprise and Innovation (2015).

Turning now to indigenous industry, a corollary of the high recorded productivity of the foreign-owned sector is that indigenous industry is much more employment intensive, as seen in Table 2.¹⁰ It is also much more oriented towards the UK market and sensitive to fluctuations in the value of sterling, factors that will also prove to have been of significance over the course of the recovery.

Table 2: Persons Employed per €10 million Sales, 2015

Irish-owned manufacturing	39
Foreign-owned manufacturing	11
Irish-owned services	52
Foreign-owned services	8

Source: Department of Business, Enterprise and Innovation (2015).

Note: These data pertain to 'agency-assisted' firms, which are for the most part oriented towards export markets.

There were three factors besides Ireland's continued attractiveness to FDI that contributed to the resilience of the Irish export sector. One was the sectoral structure of exports. Ireland was fortunate in being relatively specialised in the production of goods and services for which international demand remained buoyant. Pharmaceutical and chemical products, for example, grew as a share of total

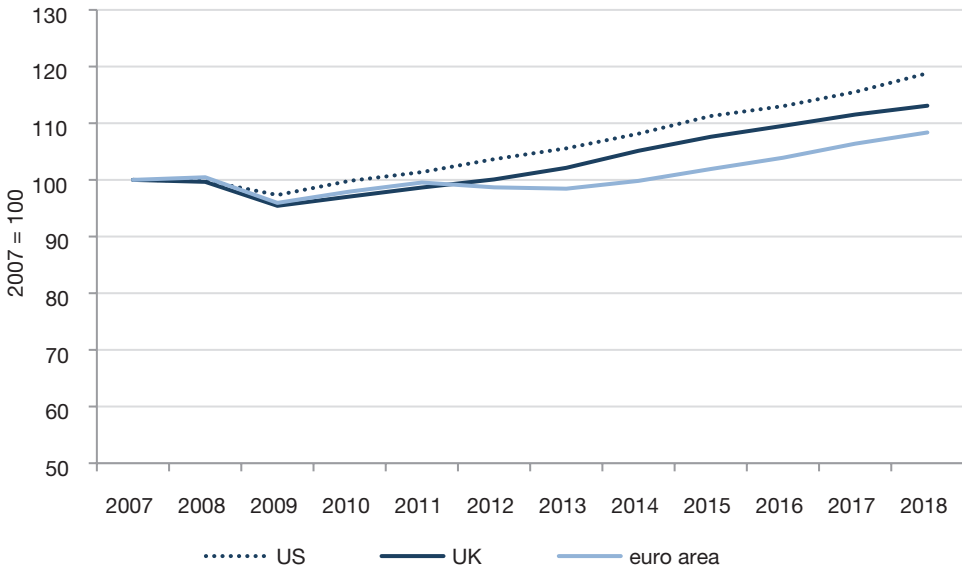
⁹ It is not known, unfortunately, what proportion of the Irish services purchased by foreign affiliates is produced by indigenous services firms rather than less labour-intensive Irish-based foreign services firms. A further quasi-linkage effect discussed below pertains to corporation tax payments.

¹⁰ While the stock of *services FDI* per job is a multiple of that for manufacturing, the gap in sales per job between foreign-owned manufacturing and services is very much smaller.

Eurozone imports, of UK imports, and of US imports over the period, and the same pattern is evident in the cases of agri-food and computer and information services (Byrne and O'Brien, 2015).

Ireland was fortunate also in its portfolio of export destinations. Both the US and the UK account for much higher shares of Irish than of overall EU exports, and these economies began to recover relatively early from the downturn (Figure 12). The Irish recovery was assisted also by the strengthening of their currencies against the euro (Figure 13).

Figure 12: Recovery in Export Destinations



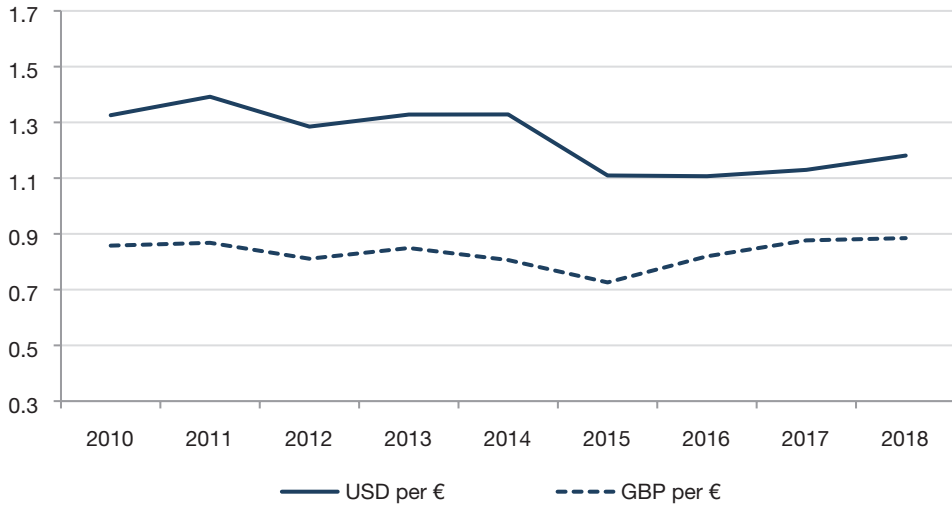
Source: Ameco database.

Sterling movements would have been of particular importance to the labour-intensive indigenous export sectors. Figure 14 charts Ireland's competitiveness gain against the UK (employing our preferred measure, as discussed above). Comparison with the earlier Figure 8 shows that the gain against the UK was far stronger than the gain against Ireland's other trading partners.

A further factor contributing to the resilience of the Irish export sector was the relative ease with which US-owned firms in Ireland appear to have been able to re-direct their sales towards the US as the latter economy recovered. Having accounted for 21 per cent of Irish manufactured exports in 2008, the American share climbed to 27 per cent by 2012, a shift effected almost entirely by Irish-based US subsidiaries (Table 3).¹¹

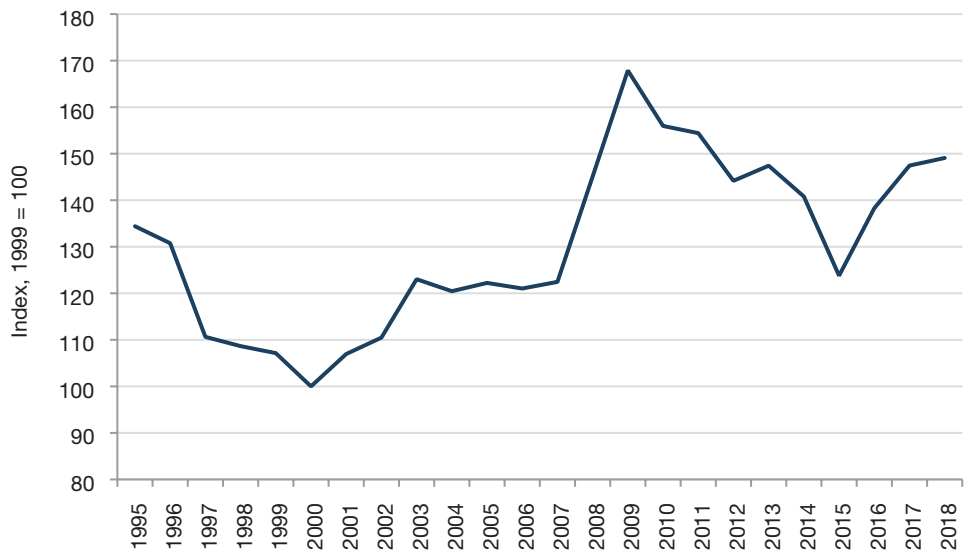
¹¹ The US is a less significant destination for Irish services exports, accounting for around 10 per cent of the total.

Figure 13: Bilateral Exchange Rates



Source: Central Bank of Ireland.

Figure 14: Relative Average Hourly Earnings in Irish Manufacturing Compared to the UK in a Common Currency; Index 1999=100



Source: Central Bank of Ireland, unpublished data.

Table 3: Export Destinations (for Manufactures); Percentage by Nationality of Ownership, 2008 and 2012

	2008	2012
<i>Irish-owned</i>		
UK as share of exports	41	43
Other EU share of exports	39	38
US share of exports	11	6
Rest of World share of exports	9	13
<i>EU27-owned (other than Irish)</i>		
UK as share of exports	26	23
Other EU share of exports	41	40
US share of exports	19	20
Rest of World share of exports	13	18
<i>Non EU27-owned (primarily US)</i>		
UK as share of exports	11	9
Other EU share of exports	49	42
US share of exports	22	30
Rest of World share of exports	18	19

Source: Census of Industrial Production ('manufacturing local units which export').¹²

Brazys and Regan (2015) suggest that Ireland's well-established export-platform links with the US resulted in a further benefit. Noting that US quantitative easing led to increased venture-capital activity and financial outflows, they find a positive relationship between these US programmes and the number of FDI project announcements in Ireland.

Ireland's export sectors began to recover earlier than the rest of the economy (Whelan, 2014, Figure 16). Aggregate employment and other macro indicators began to show signs of improvement in late 2012 (FitzGerald, 2014). Public net current spending, which had been in continuous decline since 2009, grew for the first time in 2013. Private consumer spending followed and investment rebounded strongly.

V CONCLUDING COMMENTS

FitzGerald (2017) notes that the problems with the Irish National Accounts – as discussed above – make it very difficult to identify which sectors are driving the economy. Taking the contribution of foreign-owned multinationals to Net National Product (NNP) as the sum of wages and corporation tax payments, he estimates that this comes to around 16 per cent – or one percentage point of the annual growth rate – of NNP over the years 2012-2015.

¹² 2012 is the latest year for which these data are available.

Application of this framework to the export base – which we have argued to be the key driver of the economy – would yield a substantially higher estimate (because of the strong export orientation of the sector). It would nevertheless be significantly lower than that assumed by Brazys and Regan (2015) who do not net out the import and profit content of foreign MNC exports. Unfortunately the available data do not allow for any more precise evaluation of the foreign-affiliate contribution in the context of our model. This remains on the agenda for future work.

REFERENCES

- Barry, F. and A. Bergin, 2012. "Inward Investment and Irish Exports over the Recession and Beyond", *The World Economy*, Vol. 35, No. 10, pp. 1291-1304.
- Barry, F. and M. Devereux, 2006. "A Theoretical Growth Model for Ireland", *The Economic and Social Review*, Vol. 37, No. 2, pp. 245-262.
- Barry, F., 2017. "The Central Bank's Harmonised Competitiveness Indicators: Users Beware", *Administration*, Vol. 65, No. 4, pp. 73-82.
- Blanchard, O., 2002. "Comment on Honohan and Walsh", *Brookings Papers on Economic Activity*, Vol. 1, pp. 58-66.
- Brazys, S. and A. Regan, 2015. "These Little PIIGS went to Market: Enterprise Policy and Divergent Recovery in the European Periphery", Geary Working Paper 2015/17, UCD Geary Institute for Public Policy.
- Byrne, S. and M. O'Brien, 2015. "The Changing Nature of Irish Exports: Context, Causes and Consequences", *Central Bank of Ireland Quarterly Bulletin*, 02, April.
- Central Statistics Office, 2017. *National Income and Expenditure Annual Results 2016*, Dublin: CSO.
- Crafts, N., 2014. "Ireland's Medium-Term Growth Prospects: a Phoenix Rising?", *The Economic and Social Review*, Vol. 45, No. 1, pp. 87-112.
- Department of Business, Enterprise and Innovation, 2015. *Annual Business Survey of Economic Impact*, Dublin: DBEI.
- Desai, M., C. F. Foley and J. R. Hines Jr., 2006. "The Demand for Tax Haven Operations", *Journal of Public Economics*, Vol. 90, pp. 513-531.
- FitzGerald J. and P. Lane, 2017. "Fiscal Policy and Financial Distress: a Balance Sheet Perspective", in Ódor, L. (ed.), *Rethinking Fiscal Policy after the Crisis*, Cambridge: Cambridge University Press.
- FitzGerald, J., 2013. "The Effect of Redomiciled PLCs on GNP and the Irish Balance of Payments", Research Note, *ESRI Quarterly Economic Commentary*, Spring.
- FitzGerald, J., 2014. "Ireland's Recovery from Crisis", *CESifo Forum* 2, (June), pp. 8-13.
- FitzGerald, J., 2017. "Getting a Fix on Multinational Input to Irish Economy", *The Irish Times*, May 26: <https://www.irishtimes.com/business/economy/getting-a-fix-on-multinational-input-to-irish-economy-1.3096205>
- Honohan, P. and B. Walsh, 2002. "Catching Up with the Leaders: The Irish Hare", *Brookings Papers on Economic Activity*, Vol. 1, pp. 1-57.
- Jones, C., 1998. *Introduction to Economic Growth*, New York and London: W.W. Norton and Co.
- Krugman, P., 1993. "Lessons of Massachusetts for EMU" in Torres, F. and F. Giavazzi (eds.), *Adjustment and Growth in the European Monetary Union*, Cambridge: Cambridge University Press.

- Krugman, P., 1997. "Good News from Ireland: A Geographical Perspective" in Gray, A. (ed.), *International Perspectives on the Irish Economy*, Dublin: Indecon.
- McNamara, D. and C. MacCoille, 2016. "Problems with Ireland's National Accounts: A User's Perspective", paper presented to Annual Conference of the Dublin Economics Workshop, Wexford, September 24.
- Mutti, J. and H. Grubert, 2009. "The Effect of Taxes on Royalties and the Migration of Intangible Assets Abroad" in Reinsdorf, M. and M. J. Slaughter (eds.), *International Trade in Services and Intangibles in the Era of Globalization*, pp. 111-137, Chicago: University of Chicago Press.
- O'Brien, D. and J. Scally, 2012. "Cost Competitiveness and Export Performance of the Irish Economy", *Central Bank of Ireland Quarterly Bulletin*, Q3, pp. 86-102.
- O'Brien, D., 2010. "Measuring Ireland's Price and Labour Cost Competitiveness", *Central Bank of Ireland Quarterly Bulletin*, Q1, pp. 99-113.
- O'Leary, E., 2015. *Irish Economic Development: High-Performing EU State or Serial Underachiever*, London: Routledge.
- Pollard, S., 1981. *Peaceful Conquest: The Industrialization of Europe, 1760-1970*, Oxford: Oxford University Press.
- Purdue, D. and H. Huang, 2016. "Irish Exports: the Facts, the Fiction and the Risks", Dublin: National Treasury Management Agency.
- Romalis, J., 2007. "Capital Taxes, Trade Costs and The Irish Miracle", *Journal of the European Economic Association*, Vol. 5, Nos. 2-3, pp. 459-469
- Siedschlag, I., M. Di Ubaldo and M. T. Koecklin, 2017. *Comparative Performance of Indigenous and Multinational Firms Operating in Ireland: Final Report*, Dublin: The Economic and Social Research Institute.
- Whelan, K., 2014. "Ireland's Economic Crisis: The Good, the Bad and the Ugly", *Journal of Macroeconomics*, Vol. 39, pp. 424-440.