



CENTRE FOR BREXIT
POLICY

THE CASE FOR LOW CORPORATE TAXATION

Lessons from the International
Pharmaceutical Industry

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THE CENTRE FOR BREXIT POLICY

The Centre for Brexit Policy (CBP) is a think tank backed by cross-party voices who support the UK leaving the EU. The CBP was formed to propose the critical policy changes enabled by Brexit that will boost national prosperity and well-being in years to come, as well as help ensure that Britain fully 'takes back control' after leaving the European Union.

The CBP aspires to trigger a deep and wide debate about what Brexit should mean for the UK over the next decade or two. By providing a focus for the development of post-Brexit public policy, the CBP hopes to help formulate an overarching framework for the UK that maximises the opportunities Brexit affords. This will be promoted to Government, Parliamentarians, and the public welcoming contributions from those who want to see Brexit open a new and fruitful chapter in our country's life.

The CBP has three core objectives:

- Identify the benefits and opportunities of Brexit across the full spectrum of economic, trade, social, foreign, defence and security policy areas proposing new policies for the Government's agenda
- Continue to make the intellectual, evidence-based case for a 'real' Brexit and provide the Government with clear and constructive advice on how to deal with ongoing negotiation and implementation issues. A 'real' Brexit means regaining full control over our laws, borders, seas, trade, and courts.
- Check any attempts to dilute Brexit, as well as serving as a catalyst and rallying point for positive news stories that, over time, will be able to persuade and demonstrate the many substantial advantages of Brexit

Delivery of these objectives is based on professional, substantive fact-based research by experts in their fields leading to authoritative reports, short papers, OpEds, events, and briefing meetings - both within and without Government.

The CBP is supported by a cadre of expert CBP Fellows drawn from multiple disciplines to provide additional expertise and experience in developing an agenda for policy change that will ensure the British people benefit from Brexit.

AUTHOR

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EXECUTIVE SUMMARY

The supply-side economic policies proposed by the recent Truss government followed by their subsequent reversal has triggered debate on the impact of taxation on the UK economy. In particular, recent events have made the relationship between corporate taxation and investment into a public issue. This should trigger some soul-searching in the UK Treasury on corporate taxation policy.

It is highly informative to look at case studies of particular industries. This paper traces the impact of evolving corporation tax policy on the investment, revenues and exports of the Irish, UK and US pharmaceutical industries, which serves as an ideal case study.

LOW CORPORATE TAX DRIVES PHARMACEUTICAL INVESTMENT

Does lower corporation tax genuinely lead to increased investment? While economists tend to approach this question from a theoretical macro-modelling perspective (which has its place), detailed analysis by industry business analysts can provide practical, empirical conclusions.

- **Pharma Provides an Ideal Case Study**
- **Low-Tax Ireland Creates a World-Class Pharma Industry**
 - Ireland was home to the third-biggest pharma export industry in Europe in 2020
 - Ireland's pharma industry has grown very quickly – thanks to exports. In 2021, they were worth \$67.5 billion, or more than 2.5 times the UK's equivalent exports
 - Ireland has seen 'close to' the biggest investment in biotech facilities anywhere in the world over the last decade
 - Ireland's corporate tax rate fell from 40 per cent in 1996 to 12.5 per cent in 2003, and it has stayed at that level for the past 19 years
 - Various taxation rules enable global companies to minimise taxation in Ireland. These arrangements are particularly popular with US-based technology and life-sciences corporations
- **Pharma Languishes in the High Tax UK Environment**
 - Since 2010, UK pharma exports have either stagnated or declined, predominantly due to falls in sales to EU markets
 - Factory output for UK pharmaceuticals peaked in 2010 at £18.7 billion (or £21.9 billion in 2019 prices) before commencing a five-year decline
 - A rough balance in UK-EU trade up until 2009–10 turned into a £10 billion deficit by 2019, as manufacturing slid offshore. Trade in pharmaceuticals now generates the third highest sectoral deficit in UK-EU trade, after motor vehicles and food
 - On average, Ireland's corporation tax rate has been between one half to two-thirds of the UK rate over the past two decades
 - For Irish pharma, it appears that tax is the key differentiator in investment decision-making

- **US Mirrors UK's Decline and Demonstrates Importance of Low Corporate Taxation**

- A stagnation in US pharma manufacturing mirrors the UK's experience, and Ireland appears to have had a direct role in the deterioration of US trade in pharmaceuticals
- The robust reaction in the US to an offshoring of pharma manufacturing and Ireland's export success demonstrates that public officials in the US now appreciate the critical importance of differential corporate tax rates
- The importance of low corporate taxation is underscored by Ireland's concerns about recent US and global tax initiatives

- **UK Remains in Denial**

- UK public policy debate on tax and investment is staggeringly behind policy debate in the US and Ireland
- Trump's lowering of corporate tax rates and the subsequent resulting support for a GMCTR shows a more advanced awareness of the perils of tax competitiveness than policy discussion in the UK
- A direct contrast with UK public policy discussion is painful. It took a leadership race in the Conservative Party to bring the issue to the foreground of political debate.
- The UK Government now wishes to increase the corporate tax rate from 19 per cent to 25 per cent from April 2023. This will significantly decrease the relative competitiveness of UK pharma manufacturing as compared to Ireland.
- Without policy change, the continued decline of UK pharma manufacturing and exports looks inevitable.

ADDRESSING UK PHARMA'S FUTURE

Given the UK's leadership in cell and gene therapies (CGTs), the opportunity for UK pharmaceutical manufacturing is colossal. The levers for success are in the hands of UK politicians.

- **Why UK Pharma Matters**

- The history of UK pharma manufacturing indicates that the UK can be a fast-growing powerhouse of pharma exports
- Before decline set in 2009-10, UK exports of pharmaceuticals to the EU grew by a CAGR of 10.2 per cent
 - This was the fastest, sustained growth rate notched up by a major export sector of UK manufacturing in trade with EU markets over the past 20 years
 - The CAGR of exports to the EU across *all* UK manufacturing sectors for the two decades prior to 2019 was just 0.5 per cent.
- All is not lost. The UK appears to have built a convincing lead in 'next generation' CGT technologies and is already hosting 12 per cent of clinical trials in advanced therapeutic medicine products
- This leadership will be wasted unless UK gets its taxation affairs in order

- **Spending on Research: Not Quite the Cure-All**

- UK tax policy is obsessed with encouraging research and development, as if that alone will deliver growth.
 - A tax policy that encourages UK-based research but fails to encourage UK-based manufacturing risks seeing practically all the benefits of that research go offshore, including tax revenue from UK-based business
 - Spending on research of itself *only* creates jobs in research: nothing else follows automatically.

- **Super-Deductions Might Help**

- One potential route for the UK is to compete in terms of the tax treatment of capital investment – i.e., a 130 per cent super-deduction for capital allowances
- This resonates with recent analysis: Ireland’s more generous treatment of tax credits on capital expenditure has recently encouraged Pfizer to locate a new research centre into continuous flow chemistry technology in Ireland rather than in the UK
- On the other hand, tax-arrangements such as the super-deduction distort free-market economics, complicate the tax system, and should not be used as a rationale for increasing corporate tax rates

- **View Taxation Strategically**

- Ireland’s great achievement was to decide that pharma is a strategic industry, and then ensure that the country remains – in terms of taxation – a highly profitable jurisdiction in which to manufacture medicines. This comprehensive approach has worked.
 - Fiscally, the policy is an almighty success. Receipts from corporation tax are at an all-time high in Ireland.
 - Irish corporate tax policy is an industrial success as well – and that is the point the UK Treasury needs to absorb
- Whatever the UK Treasury argues, Irish corporate tax policy has created a booming pharmaceutical export industry. The UK Treasury is throttling one.

THE CASE FOR LOW CORPORATE TAXATION

Lessons from the International Pharmaceutical Industry

The supply-side economic policies proposed by the recent Truss government followed by their subsequent reversal has triggered debate on the impact of taxation on the UK economy. In particular, recent events have made the relationship between corporate taxation and investment into a public issue. This should trigger some soul-searching in the UK Treasury on corporate taxation policy.

There is a rich vein of academic research supporting the economic benefits of low corporate tax rates (see Appendix A). For example, research at Cardiff University by Prof Patrick Minford¹ shows that lower corporate tax rates contribute to higher GDP growth. This work shows that reductions in corporation tax and regulatory innovation have quite large effects in raising the UK growth rate. And it also shows that reductions have a disproportionate effect on the North because there are more spare resources there than in the congested South.

However, this debate need not be just a policy discussion about the whole economy's behaviour in all its sectors. It is also highly informative to look at case studies of particular industries. If the new Conservative Government wants to see what a successful corporate tax policy can achieve, then it could glance across the Irish Sea at Ireland's pharmaceutical industry. In addition, ministers might also observe the damage that an uncompetitive corporate taxation policy has caused to the pharmaceutical industry in both the UK and the US.

This paper traces the impact of evolving corporate taxation policy on the investment, revenues and exports of the Irish, UK and US pharmaceutical industries. The paper draws two major conclusions:

1. **Low levels of corporate taxation have driven investment in the Irish pharmaceutical industry and resulted in extraordinary export growth; comparatively high levels of corporate taxation have triggered stagnation or decline in pharma manufacturing in both the UK and the US – a lesson not yet learned by the UK.**
2. **Unless the new UK Government rethinks its current corporate taxation regime, it is likely to squander the nation's current technological lead in cell and gene therapies (CGTs), thereby dealing another blow to the economically and strategically important pharmaceutical industry.**

LOW CORPORATE TAX DRIVES PHARMACEUTICAL INVESTMENT

Does lower corporation tax genuinely lead to increased investment?

While economists tend to approach this question from a theoretical macro-modelling perspective (which has its place), detailed analysis by business analysts can provide practical, empirical conclusions. Unlike economists, business analysts deal with specific industries. They investigate the factors that make particular industries tick – a subtlety sometimes lost on those who only deal in economic models.

But how to answer the question? What analysts need is an industry that is dominated by a few global corporates with shiftable supply chains. The analysis also requires an industry where global tariffs are zero or minimal. And it requires an industry where regulations are, in effect, global – in that goods that are made and sold in one country can (without modification) be legally sold in another.

¹ North and South: A Regional Model of the UK' by Patrick Minford, Yue Gai and David Meenagh *Open Economies Review*, 2022, vol. 33, issue 3, No 7, 565-616

Pharma Provides An Ideal Case Study

One industry fits this pattern perfectly: pharmaceuticals.

This is an industry worth examining for several reasons. First, it is the UK's sixth biggest manufacturing-export industry. From 2000 to 2010 it was also UK's fastest growing, in terms of exports. This implies that it is – or was – a highly competitive industry for UK manufacturing.

Also, UK pharma has solid foundations. The pharmaceuticals industry typically receives the highest proportion of research and development (R&D) of any UK manufacturing sector, according to Make UK (formerly the Engineering Employer's Federation).² So, UK pharmaceutical manufacturing should – in theory – be highly competitive.

And last, there's a neat comparison close at hand. Just across the Irish Sea, Ireland has grown one of the biggest pharmaceuticals manufacturing industries in all Europe over the past 20 years. At the same time, growth in pharma manufacturing in the UK and US has either stagnated or fallen. Over almost all that same time period, the Irish corporate tax rate has been significantly lower than either UK or US corporate tax rates.

So, is there a link between the two: does a low corporate tax rate lead to increased investment in pharma manufacturing, and vice versa?

In the following sections of this paper, we compare the pharma industry outcomes resulting from three different corporate taxation regimes in the UK, Ireland, and the US.

Low-Tax Ireland Creates a World-Class Pharma Industry

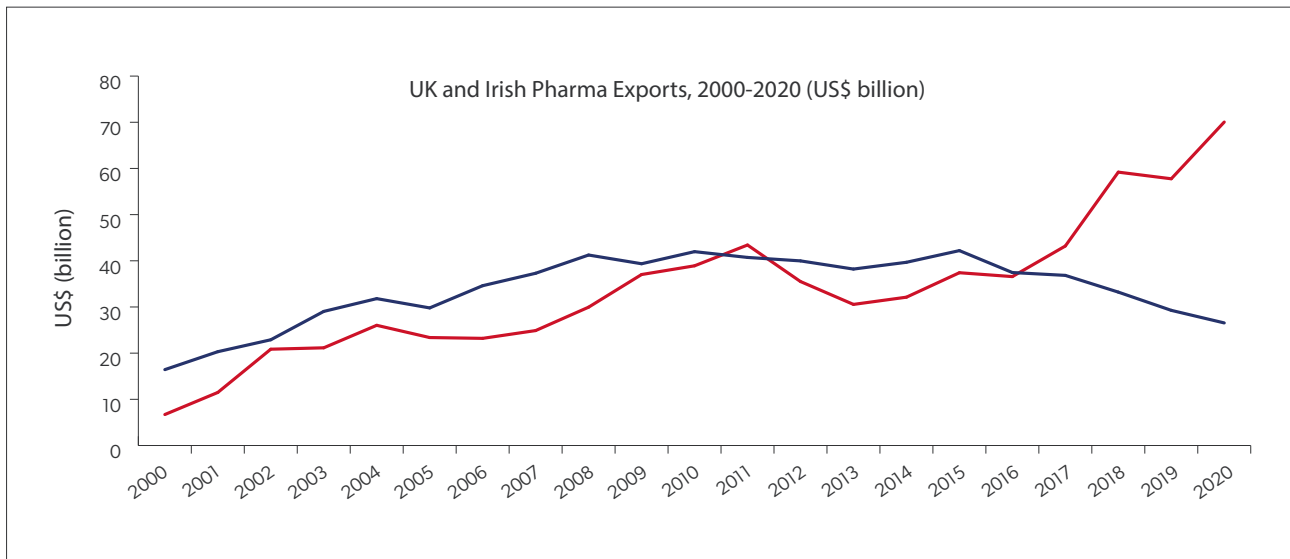
First, the basic facts. Compared to its size, Ireland has an enormous pharmaceutical export industry. According to the European Federation of Pharmaceutical Industries and Associations, Ireland was home to the third-biggest pharma export industry in Europe in 2020.³ By value, only Switzerland and Germany exported more.

Ireland's pharma industry has also grown very quickly – thanks to exports. This is clear from UN Comtrade data. Back in 2000, Ireland's pharma exports were worth just \$6.7 billion (2021 prices), or 40 per cent of the value of UK pharma exports. In 2021, they were worth an astonishing \$67.5 billion, or more than 2.5 times the UK's equivalent exports. In other words, in real terms, the value of Ireland's exports grew by a factor of 10 in just over two decades. Today, pharma is easily Ireland's biggest export industry, accounting for 37.9 per cent of Irish goods exports in 2021.⁴

2 Make UK. Pharmaceuticals. Page 14. [Link](#)

3 European Federation of Pharmaceutical Industries and Associations. Key data , 2022. Page 18.

4 Central Statistics Office (Ireland). CSO Statistical Release. Goods Exports and Imports. Table 3. Goods exports and imports classified by commodity. Dec-Jan 2021. Published February 15 2021. Accessed on 30 August 2022. [Link](#)



Source: UN Comtrade. HS 30. Accessed 30 July 2022. 2021 prices.

According to the Irish inward investment agency, the IDA, Ireland has seen ‘close to’ the biggest investment in biotech facilities anywhere in the world over the last decade.⁵ This observation matches the export trajectory in the graph above. Assuming that investments take 18 months to 2 years to translate into production, then from about 2011–12 onwards, investment has powered an export-led boom in Irish pharmaceuticals, enabling Ireland to comprehensively overtake UK as an exporter of pharmaceuticals goods.

So, what’s been going on? Ireland’s corporate tax rate fell from 40 per cent in 1996 to 12.5 per cent in 2003, and it has stayed at that level for the past 19 years. However, the *effective* corporate tax rate in Ireland is almost invariably far lower, owing to various allowances and tax-shielding measures. These have included the so-called ‘Double Irish’ tool that allowed US companies to shield profits from US tax authorities, including via offshore havens.⁶ These arrangements are particularly popular with US-based technology and life-sciences corporations. The EU required the Republic to close this scheme from 2015 onwards, although the loophole was still being used in 2018 by US-based Gilead, according to the Times.⁷

More recently, the Organisation for Economic Cooperation and Development (OECD) has coordinated efforts to mitigate some national advantages in corporate tax. The OECD announced a deal on a Global Minimum Global Corporate Tax Rate (GMCTR) to include 136 jurisdictions in October 2021.⁸ If implemented, the deal will impose a minimum 15% corporate taxation rate on all members for companies with revenues above €750 million. And it will also force very large global companies (with annual revenues of over €20 billion) to allocate a share of their profits to jurisdictions where those sales are generated. The agreement was due to come into force in 2023, although implementation is currently in doubt.

Ireland – along with Hungary and Estonia – was among the very last members of the OECD to sign up to the agreement.⁹

5 IDA: Biopharmaceuticals Industry Ireland. Accessed August 2020.

6 The Irish Times. Abbot Laboratories Irish Subsidiary paid no tax on €1.8 billion profit. May 2013 [Link](#).

7 The Times. US pharma giant Gilead uses ‘Double Irish’ tax loophole. [Link](#).

8 OECD. International community strikes a ground-breaking tax deal for the digital age. October 2021. [Link](#).

9 CNN. 136 countries agree to minimum corporate tax rate after Ireland drops its opposition. October 2021. [Link](#)

Pharma Languishes in the High Tax UK Environment

The UK's experience has been quite different. Pharma exports grew strongly from 2000 to around 2008–2010, then suddenly stagnated. Since 2015, pharma exports have either stagnated or declined, depending on the market. From trade data it's clear that export declines are predominantly due to falls in sales to EU markets, and that this trend commenced around 2012.

This export trajectory partly reflects trends in UK pharma manufacturing. ONS data gathered for the Annual Business Survey (ABS)¹⁰ shows that factory output for UK pharmaceuticals peaked in 2010 at £18.7 billion (or £21.9 billion in 2019 prices). The value of output then commenced a five-year decline, bottoming out at £13.6 billion in 2015. This matches the period when UK exports suddenly stalled (see graph above). Although UK output recovered and finally surpassed its 2010 level in 2019, gross value added (GVA) in the sector has still not regained its 2010 peak and exports continue to fall.

These changes in UK output have drastically impacted UK trade patterns in pharmaceuticals goods. A rough balance in UK–EU trade up until 2009–10 turned into a £10 billion deficit by 2019, as manufacturing slid offshore. Incidentally, this £10 billion deficit is big by UK industry standards. Trade in pharmaceuticals now generates the third highest sectoral deficit in UK–EU trade, after motor vehicles and food.

To an extent, this drop in output and export stagnation can be tracked to corporate disinvestment. In 2011, Pfizer moved its Viagra-creating research and development (R&D) centre from Sandwich in Kent to Ringaskiddy, near Cork in Ireland. In 2012, Sanofi closed its Newcastle plant, and in 2014 Novartis closed its operations at Horsham.

But to what extent is UK corporation tax to blame for this disinvestment? The difference in UK/Irish corporation tax rates in this period is stark. The UK's main rate of corporation tax was 30 per cent 20 years ago, and from 2008 it began a gentle drift downwards to 19 per cent where it is today. This means that on average, Ireland's corporation tax rate has been between one half to two-thirds of the UK rate. Then again, Ireland's corporate tax regime had the effect of helping global companies to minimise overall tax exposure. So, the question then becomes: to what extent has low corporation tax or tax schemes or a combination of both encouraged pharma companies to invest in Ireland, rather than UK?

Prima facia, the evidence is compelling. Most professional services firms cite a combination of a low corporate taxation rate, alongside IP regimes and research and development (R&D) tax offsets¹¹ as factors that make investing in pharma manufacturing in Ireland competitive. Indeed, a recent KPMG analysis¹² shows that on most metrics, Ireland is not particularly competitive against Belgium and Switzerland in terms of pharmaceuticals – *except on corporation tax rates*. On most other competitive metrics – skilled labour, R&D and strong regulation – the UK performs strongly as well.

For Irish pharma, it appears that tax is the key differentiator in investment decision-making. Corporate tax gets a mention in every investment guide to pharma in Ireland, although it's inescapably part of wider mix of tax-related financial incentives, which include capital allowances¹³. True, the UK – or at least Britain – no longer enjoys seamless access to EU markets. But the stagnation in UK pharma manufacturing and exports commenced six years *before* the Brexit referendum took place.

¹⁰ ONS. Annual Business Survey, 24 June 2021. [Link](#)

¹¹ PwC. Why Ireland for Pharma and Life Sciences. [Link](#)

¹² KPMG. Global Life Sciences, Making the case for Ireland. July 2022. [Link](#)

¹³ EY. Tax and pharma and Ireland. [Link](#)

US Mirrors UK's Decline and Demonstrates Importance of Low Corporate Taxation

Another way to analyse the relationship between corporate tax and pharma manufacturing is to observe events in the US pharmaceutical industry. This leads to three key observations.

1. **The US decline in pharma manufacturing mirrors that of the UK, with Ireland and corporate tax rates being key factors.** In a late-2019 testimony to a Congressional committee, the Director of the Center for Drug Evaluation and Research (CDER) at the US Food and Drug Administration commented that, while the US is a world leader in drug discovery and development through its biomedical research, the US *"is no longer at the forefront of drug manufacturing... in recent decades, drug manufacturing has gradually moved out of the United States."*¹⁴ This observation was made just prior to the COVID pandemic and almost exactly mirrors the UK's predicament.

Production and trade data show the scale of the problem:

- According to US Census data, pharmaceutical manufacturing in the US grew steadily in the decade up to 2007–8, when it peaked at \$213 billion (2015 dollars). Pharma manufacturing in the US has since plateaued (mostly within 10 per cent of that peak) but it is no higher today in real terms than it was in 2007–8.¹⁵
- Export growth in US pharma also stalled, from 2009 to about 2014, according to UN Comtrade data (although 2021 was an exceptionally strong year for US pharma exports).
- Meanwhile, imports have rocketed. The US trade deficit in pharma has consequently ballooned, from \$20–30 billion in 2010 to 2015, to \$70–\$ 86 billion from 2019. This approximately mirrors the UK's trading experience with the EU.

There are differences in how outsourcing has evolved between the two countries.

- In the UK, offshoring was not at all due to investment in low-cost manufacturing centres in order to supply UK markets. Imports from *outside* the EU plateaued from 2011. Meanwhile imports from the EU itself almost doubled, with imports from Netherlands growing particularly strongly.
- In the US, rocketing imports can be attributed to offshoring to both high and low-cost production countries. According to FDA data:
 - China accounted for 13 per cent of active pharmaceutical ingredients (APIs) sold in the US in 2019, and India 18 per cent.¹⁶
 - At the same time, the EU was the largest single external supplier, accounting for 26 per cent of the APIs sold into the US market in 2019.

It's at this point that Ireland emerges as a key player in disinvestment in US pharmaceutical manufacturing. Comtrade data indicates that more than half of US pharma imports from the EU come from Ireland. Twenty years ago, the Irish Republic exported just \$5–6 billion of pharma goods annually to the US. From 2018–2021, it averaged a huge \$27.3 billion. This is a very large number in global pharma trade. It is at least double the value of UK pharma exports to the entire EU — at any recent exchange rate. And as an aside, this example shows how some countries can build gigantic export industries without any assistance from free trade agreements, or indeed membership of a customs union or single market.¹⁷

14 US Food and Drug Administration: Safeguarding Pharmaceutical Supply Chains in the Global Economy, October 2019. Testimony before the House Committee on Energy and Commerce. [Link](#)

15 US Census. Manufacturers' Shipments, Inventories, & Orders, Pharmaceutical and Medicine Manufacturing: US Total. [Link](#). Accessed October 2022. [Link](#) to data.

16 US Food and Drug Administration. Safeguarding Pharmaceutical Supply Chains in the Global Economy, October 2019. Testimony before the House Committee on Energy and Commerce. [Link](#)

17 Note: Trade in pharma between the EU is governed by mutual recognition agreements (MRAs). The EU has pharma related MRAs with multiple developed economies, including Australia, Japan, Switzerland and the US.

Ireland's emergence as a major pharmaceuticals supplier to the US is hardly surprising. It demonstrates the apparent sensitivity of pharmaceutical companies to corporate tax rates, as US Federal corporate tax rates have been even higher than those of the UK. The US federal corporate tax rate had been 35 per cent although, in 2017, legislators reduced and flattened rates to 21 per cent (see below) as part of the Trump-era lowering of corporate taxation. However, state corporate income taxes can raise the total effective federal and state tax rate to as high as 30 per cent (New Jersey), albeit some states (e.g., Texas) have no state corporate tax. So, total effective US corporation tax rates have historically been as high as 35 per cent to almost 50 per cent (including taxes of high-taxing states) and now range between 21 per cent and 30 per cent. And this is before consideration is taken into account of the various means by which Ireland enables multinational companies registered in the Republic to minimise their overall corporate tax exposure.

2. **The robust reaction of US policy makers to Ireland's pharma success and offshoring losses to other countries demonstrates an appreciation of the critical importance of differential corporate tax rates.** Where the US differs radically from the UK is that public policy has proved far more alert to the probable causes of offshoring and sudden sectoral deficits. By 2017, commentators in the US were well aware that US pharmaceutical companies were shifting manufacturing offshore in order to take advantage of low corporate tax.¹⁸ President Trump complained specifically about the offshoring of US pharmaceuticals from the start of his Presidency¹⁹ and promised to slash US corporation tax in response.

The US Tax Cuts and Jobs Act (TCJA) of 2017 duly introduced a flat 21 per cent federal corporate tax rate, down from a top rate of 35 per cent. Legislators hoped that the Act's Global Intangible Income Low-taxed Income (GILTI provisions) would reduce the incentives for pharma companies to set up corporate headquarters in countries with low corporate tax rates and declare the bulk of their revenues from those offshore headquarters.

Of particular importance to this paper is that Trump singled out Ireland as one of the reasons to pass the Act before it was signed into law in late 2017.²⁰ In fact Trump never stopped identifying Ireland and its corporate tax regime as a threat to US pharma manufacturing.²¹ Tellingly, this reaction is a bi-partisan concern. The understanding that other countries' corporate tax rates impacted US manufacturing survived into the Biden Presidency. So did the desire to do something about it. This became clear as President Biden pursued the GMCTR initiative (see above) through to an OECD agreement in October 2021.²²

The fact that US officials have pursued various remedies across two presidencies shows that US policy makers clearly do believe that low corporation tax and other tax policies impact investment in US manufacturing.

18 Forbes. Trump Trade Policy and Manufacturing: the case of the chemicals industry. Thomas Deusterberg, Sept 2018. [Link](#)

19 The Wall Street Journal. Trump's Criticism of Imports Adds to Drugmakers' Headaches. [Link](#)

20 The Irish Times. Trump singles out Ireland in tax speech. November 2017. [Link](#)

21 The Irish Times. Trump singles out Ireland in battle to bring pharma manufacturing back to the US. May 2020. [Link](#).

22 OECD. International Community Strikes a Ground-breaking tax deal for a Digital Age. [Link](#)

3. **The importance of low corporate taxation is underscored by Ireland’s concerns about US and global tax initiatives.** Irish officials have not been slow to react to US initiatives. In 2017, as Trump prepared the groundwork for TCJA, consultants and tax authorities in Ireland instantly realised the potential impact of lower US corporate tax on Ireland’s pharma industry. Deloitte, for example, warned that ‘*an aggressive cut in US Corporation Tax could choke off investment in Ireland’s pharma and med-tech sectors.*’²³ The advent of Biden’s GMCTR triggered similar warnings that a forced increase in Irish corporate tax would hit investment.²⁴

So, even if officials in the UK don’t think corporate tax matters in terms of investment, officials and commentators in Ireland and the US clearly do. And one of the two sectors most discussed in the context of low corporate taxes is pharmaceuticals.

UK Remains in Denial

The above analysis indicates that corporate taxation has been a strong determinant of investment in the pharmaceuticals industry. While other factors also matter – e.g., the overall corporate taxation regime, tax offsets and taxation of capital investment – a low corporate tax rate has been the fundamental basis of how the Irish pharmaceutical industry has sold itself to global investors and that country’s spectacular pharmaceutical export performance speaks for itself. The data is unequivocal.

Another critical takeaway from the above is that the UK public policy debate on tax and investment is staggeringly behind policy debate in the US and Ireland. In the US, Ireland’s competitive corporation tax was identified back in 2017 as a significant impediment to the US’ own pharma industry. And discussion shows an awareness not just of the impact of corporate tax on revenues or business activities, but specifically the impact on manufacturing. A direct contrast with UK public policy discussion is painful. The decline in UK pharma production and exports was already five years in the making when the Brexit referendum took place. And yet, astonishingly, none of the Brexit-related debate on UK trade came close to identifying one of the most obvious threats facing a major UK export sector. It took a leadership race in the Conservative Party to bring the issue to the foreground of political debate.

The new Sunak Government now proposes to increase corporate taxation from 19 per cent to 25 per cent from April 2023. This will decrease significantly the relative competitiveness of UK pharma manufacturing compared to Ireland and the US. Thus, the outlook for UK-based pharma manufacturing is bleak. Without policy change, the continued decline of UK pharma manufacturing and exports looks inevitable.

23 The Irish Times. Irish pharma and medtech at risk from US tax cuts, says Deloitte. April 2017. [Link](#)

24 The Irish Times. Biden’s ‘global minimum’ tax rate carries big dangers for Ireland. March 2021. [Link](#)

ADDRESSING UK PHARMA'S FUTURE

Continued decline of the UK pharma sector is not a given, however. Given the UK's leadership in cell and gene therapies (CGTs), the opportunity for UK pharmaceutical manufacturing is colossal. The levers for success are in the hands of UK politicians. The first step towards capitalising on such leadership is realising what is at stake, and what has gone wrong in the past.

Why Pharma Matters

The history of UK pharma manufacturing from 2000—2009 indicates that the UK can be a fast-growing powerhouse of pharma exports. Between those years, UK exports of pharmaceuticals to the EU grew by a CAGR of 10.2 per cent. This is easily the fastest, sustained growth rate notched up by a major export sector of UK manufacturing in trade with EU markets over the past 20 years. For comparative purposes, the CAGR of exports to the EU across *all* UK manufacturing sectors for the two decades prior to 2019 was just 0.5 per cent, as measured in the most generous way possible.²⁵ That shows what UK pharma manufacturing can achieve.

All is not lost. The UK appears to have built a convincing lead in 'next generation' CGT technologies. Those professional accounting firms that provide diligent insight into Ireland's pharma industry are already cautious of what UK *might* do. EY in Ireland estimates that the UK already has a 10-year lead over Ireland in CGTs.²⁶ This is in part thanks to the UK's CGT 'Catapult' industry accelerator. CGT prowess has triggered a rapid rise in employment in the CGT sector from 3,000 in 2019 to 7,000 in 2021²⁷. The UK is already hosting 12 per cent of clinical trials in advanced therapeutic medicine products.²⁸

But the history of the UK pharmaceuticals industry shows this leadership will be wasted unless UK gets its taxation affairs in order. Other countries in the EU, in particular Ireland, have proved far more adept at using tax to attract investment which creates jobs and then powers a huge export industry. Simply put, Ireland ensures that it is a more profitable destination for pharmaceutical investment than any peer competitor. And the effect has been stunning: 20 years ago, Irish pharma exports were worth just 40 per cent of UK exports; last year they were worth more than double.

Spending on Research: Not Quite the Cure-All

A key step in capitalising on the UK's lead in CGT is for tax officials and ministers to disabuse themselves of one dubious assumption: that spending on research leads directly to investment in manufacturing.

UK tax policy is obsessed with encouraging research and development (R&D), as if that alone will deliver growth. Yet a tax policy that encourages UK-based research but fails to encourage UK-based manufacturing risks seeing practically all the benefits of that research go offshore. Analysis of the pharmaceutical industry is instructive on this specific point. And it supports the truism that spending on research of itself *only* creates jobs in research: nothing else follows automatically. This, unfortunately, has been the long-term history of technological innovation in the UK.

25 Selecting start and end points for CAGR calculations is troublesome for UK goods exports to the EU, because the overall value over the past two decades is close to zero and the trajectory is uneven. Move the CAGR periods backwards or forwards slightly, and the result easily lurches into negative territory. The above calculation used averages for the years 1997 to 1999 and 2017 and 2019. This includes the last period (1997-98) where manufacturing export growth from UK to the EU growth was permanently sustained. A straightforward export CAGR calculation for 2000 to 2019 gives a negative value. Source: ONS BoP CP series, 2022. Precious metals excluded. Deflated using the ONS export deflator.

26 EY. Staking Ireland's claim to the next pharmaceutical frontier. October 2020. [Link](#).

27 CGT Catapult. Press release: New data shows cell and gene therapy industry creating new high value jobs and contributing strongly to opportunities across the UK. [Link](#)

28 CGT. Case Study: Powering up the cell and gene therapy industry in the UK. [Link](#)

A little data digging unearths some painful truths. The 2018 Make UK report cited above describes the pharmaceuticals industry as ‘clearly the king’ amongst all UK manufacturing sectors for R&D spending.²⁹ And note, Make UK has published recent, thorough reports on most of the UK’s biggest manufacturing industries: it is well placed to make comparative judgements. Make UK asserts that in 2016, the pharmaceutical sector received 27 per cent of total R&D spending in UK manufacturing.³⁰ In that year, however, pharmaceuticals contributed just 4 per cent to UK manufacturing turnover, according to ABS data. That’s quite a mismatch.

And it gets worse. According to Make UK, spending on R&D in UK pharmaceuticals peaked at an astonishing 40 per cent of all R&D spending in UK manufacturing in 2010.³¹ And yet ABS data reveals that this was precisely the year in which output and GVA in UK pharma manufacturing began their five-year declines. This begs some awkward questions that are relevant today: what precisely did UK manufacturing gain from that peak of investment in pharmaceuticals R&D in 2010; and what did UK taxpayers gain from the tax offsets and grants that supported this R&D?

More brutally, what happened to the fruits of that R&D spending, if it didn’t end up in UK pharma manufacturing? Where is the return on investment?

At this point, only forensic corporate accounting will help. This is a particular challenge with global pharma because the tax returns of major pharmaceuticals companies are filed in numerous jurisdictions. Some investigative journalists have made headway. In 2015, two Reuters journalists concluded that US-based Pfizer had been shifting profits generated by American scientists to a Pfizer subsidiary in Cork, Ireland. The drugs involved included the anti-cholesterol treatment, Lipitor, and the epilepsy drug, Lyrica.

Their findings included the assertion that: ‘Pfizer licenses the rights to drugs developed in the United States and in other countries like Britain, to Pfizer Ireland Pharmaceuticals, according to accounts filed by the Dutch and Belgian parents of Pfizer’s Irish units.’ The journalists found that filings for overseas units: ‘...show non-U.S. companies supply over 80 percent of US sales . . . those sales generate margins of around 40 percent for Pfizer’s overseas arm – earning it over \$17 billion in 2013. However, Pfizer has reported losses on its U.S. business in each of the past five years.’³²

Are UK Treasury officials quite sure that UK-based pharma isn’t subject to similar treatment? More specifically: are they quite sure that UK taxpayer funds aren’t being used to support research here to discover pharmaceuticals that are manufactured overseas and then sold back into the UK, while the commercial profits end up in foreign coffers? Because if that’s the case, then it’s not just UK manufacturing that is losing out, but corporate tax revenues as well. And it’s a neat demonstration of how high corporate tax rates really can lower the final tax take – in classic Laffer curve fashion.

If nothing else, this example shows the fragility of orthodox assumptions. In Ireland, investment in the pharmaceuticals industry moved up the value chain starting with basic manufacturing, *not down the value chain from research*. As recently as 2010 Ireland’s drug-discovery industry was still tiny.³³ Only now that manufacturing in Ireland has become a colossal export industry has the Republic become a noted host for research into pharmaceuticals. In Irish pharma, R&D doesn’t trigger manufacturing, it follows it.

29 Make UK. Pharmaceuticals. Page 14. [Link](#)

30 Make UK. Pharmaceuticals. Page 14. [Link](#)

31 Make UK. Pharmaceuticals. Page 14. [Link](#)

32 Reuters. How Pfizer has shifted profits overseas for years, November 2015. [Link](#).

33 Future Science. The State of the Irish Pharmaceutical Industry. Chris Van Egarat, 2012, Future Science: Future Med. Chem. (2012) 4 (9), 1039-1041.

These observations undermine the implicit Treasury assumption that subsidised research will create an industry that can be subsequently taxed safely without regard to competitors. The recent history of UK pharmaceutical manufacturing demonstrates that investment in R&D doesn't automatically lead to manufacturing and exports. For this reason alone, calls for increased tax offsets to fund R&D should be treated with extreme caution — and that includes recent calls from august bodies such as the Royal Society, the British Academy, and the Academy of Medical Science.³⁴ *Qui bono*, precisely?

Or to put the question more bluntly: what's the point of subsidising R&D in the pharmaceutical industry if the commercial benefits immediately proceed offshore, thanks to a dramatic disequilibrium in tax rates and tax offsets in Ireland and elsewhere in the EU? It's simply a waste of taxpayers' money – and a wasted opportunity for UK manufacturing. A study of UK pharma from 2010 to 2019 should be compulsory for any UK Treasury official who thinks injecting money into R&D of itself generates economic growth and exports.

Super-Deductions Might Help

It won't be easy to rectify the imbalance in investment incentives. The pharma industry in Ireland realises the threat posed by the GMCTR Agreement.³⁵ This agreement may indeed have an impact in terms of re-engineering pharmaceutical supply chains.³⁶ But it would be spectacularly unwise for the UK Treasury to rely on GMCTR to redress the existing imbalances in tax-related incentives. This is because global pharma companies have legions of accountants whose job it will be to work around international agreements to ensure Irish pharma retains its tax-related competitiveness. A local joke in Ireland runs that local pharma companies are as keen to invest in tax research as pharmaceutical research.

Of course, the key point is that even at 15 per cent, Ireland's new corporate tax rate is hugely lower than the proposed new UK tax rate of 25 per cent. And the comparative, overall corporate taxation rates for pharma companies in Belgium and the Netherlands also deserve scrutiny, since UK pharma imports from those countries have also risen steeply in recent years. Even the combined US rate in the highest taxed state (New Jersey) at 30 per cent drops to 21 per cent in states with no corporate tax.

One potential route for the UK is to compete in terms of the tax treatment of capital investment. This was Mr Sunak's favoured course during the leadership contest. When he was Chancellor, Mr Sunak admitted that the UK suffered from low levels of capital investment, but he also argued that lower corporation tax didn't necessarily lead to greater business investment.³⁷ In his view, the UK's problem was the overall tax treatment of capital assets. He argued for a 130 per cent super-deduction for capital allowances, and he received support from ex-Chancellor Nigel Lawson.³⁸

This argument resonates with recent analysis. In 2021, analyst Steven Hughes wrote an excellent investigation into the competitiveness of the UK pharmaceuticals industry, which carried the imprimatur of major related bodies including the Association of British Pharmaceutical Industries.³⁹ Hughes identified how Ireland's more generous treatment of tax credits on capital expenditure had recently encouraged Pfizer to locate a new research centre into continuous flow chemistry technology in Ireland rather than in the UK. Pfizer can claim R&D tax credits on capital expenditure in Ireland⁴⁰, and Ireland's tax credit relief rate is just 13 per cent, compared to the UK's 25 per cent.

34 Investing in UK R&D, by the by the British Academy, Royal Society, the Royal Academy of Engineering and the Academy of Medical Sciences. 2022. [Link](#)

35 The Irish Times. Significant doubt hangs over landmark 15% global corporate tax deal. April 2022. [Link](#)

36 The OECD GMCTR proposal contains two objectives: it seeks to level up national corporate tax rates to a minimum 15%; it also seeks to force global companies to pay more in corporate taxes in those jurisdictions where it actually sells goods.

37 The Mais Lecture, February 2022. [Link](#)

38 Nigel Lawson in The Telegraph. Rishi Sunak is the only candidate who understands Thatcherite economics. August 2022. [Link](#)

39 WPI Strategy. Making the UK a science superpower. Steven Hughes, February 2021. [Link](#)

40 WPI Strategy. Making the UK a science superpower. Steven Hughes, February 2021. Page 13. [Link](#).

There are obvious negatives to this approach. Tax-arrangements such as the super-deduction distort markets and complicate the tax system. What's more, the devil will be in the detail — and it's likely that Ireland comprehensively outranks the UK in terms of pharma-related tax expertise. More importantly, a super-deduction should not be used as a rationale for increasing corporate tax rates (as Prime Minister Sunak suggested during his leadership campaign) without clear evidence that it will outweigh the obvious un-competitiveness of UK corporate taxation.

Nevertheless, this approach may help to remove the binary either/or nature of debate. Sunak and Truss were both right, in terms of the pharma industry. Truss was right to suggest that lower corporation tax encourages investment, at least in the pharmaceuticals industry. And generous taxation for capital spending also appears to have given Ireland the edge in investment decision making. Neither is sufficient, however. Actually, it's the entirety of the taxation regime that matters as it impacts a global pharma company.

View Taxation Strategically

Ireland's great achievement is to decide that pharma is a strategic industry, and then ensure that when all is said and done, the country remains – in terms of taxation – a supremely efficient jurisdiction in which to manufacture medicines. This comprehensive approach has worked. It's why Ireland's \$60–70 billion of annual pharma exports dwarves Britain's. This achievement is not just the result of specific taxation schemes. If allowances or offsets on capital spending were sufficient incentives by themselves, then Ireland would not hold on to the lowest rate of corporate tax possible.

In reality, the argument over corporation tax has already been won by the Irish Finance Ministry – on all fronts. Receipts from corporate taxation in Ireland are currently at record highs, despite the fact that its headline corporate tax rate is way below the OECD average.⁴¹ Indeed, in the first half of 2022, corporate taxes delivered *almost a quarter of all tax receipts* to the Irish Finance Department, thanks mostly to big US tech and pharma companies. Fiscally, the policy is an almighty success.

But Irish corporate tax policy is an industrial success as well – and that is the point the UK Treasury needs to absorb. In Ireland, investment in pharma and technology is powering a boom in trade. In 2021, Ireland's goods exports reached record levels⁴², thanks mostly to pharma and big tech. This export surge is powered by investment from overseas. According to official sources, the foreign direct investment base in the Republic of Ireland accounts for 72 per cent of all Irish exports, in monetary terms.⁴³ Tech and pharma companies dominate inward investment in Ireland.

Whatever the UK Treasury argues, Irish corporate tax policy has created a booming pharmaceutical export industry. The UK Treasury is throttling one.

41 The Irish Times. Record tax receipts deliver €5 billion surplus for Exchequer. August 2022. [Link](#).

42 Central Statistics Office (Ireland). CSO Statistical Release, 15 February 2022. Goods Exports and Imports. Accessed on 30 August 2022. [Link](#)

43 Irish Government. Trade and Investment Strategy 2022-26. Page 3. [Link](#)

APPENDIX A - RESEARCH ON TAX, REGULATION AND THE SUPPLY SIDE EFFECTS ON GROWTH

Research in Cardiff has produced a new regional model of the UK to frame the best way for policy to address this agenda. Our work (Gai, Y., Meenagh, D., and Minford, P. (2020) North and South: A Regional Model of the UK, Cardiff Economics Working Papers E2020/14, forthcoming Open Economies Review. http://carbsecon.com/wp/E2020_14.pdf) produces the policy results shown in Table 1 of the paper. The model is based on well-known and well-tried ideas of supply-side channels through which targeted tax cuts and regulative reform raise entrepreneurial incentives to innovate as well as creating labour market flexibility and lowering labour costs. Previous work has shown that these sorts of policy have worked well in the UK to boost the economy in the 1980s and 1990s. Much policy commentary has criticised the government for aiming at 'levelling-up' without any strategy for achieving it. We show here that there is a potential strategy that is feasible without affecting public sector solvency; also that it 'levels up' the North without cutting down the South- all boats rise in this strategy.

Previous work of this sort on the effects of supply-side reform on the UK includes:

Minford, Lucy and David Meenagh (2019). "Testing a model of UK growth: A role for R&D subsidies". *Economic Modelling* 82, pp. 152–167.

Meenagh, D., Minford, P. and Yang, X.(2021) 'A heterogeneous-agent model of growth and inequality for the UK' working paper No E2018/17, Cardiff Economics Working Papers from Cardiff University, Cardiff Business School, Economics Section; published as 'Inequality and Economic Growth in the UK', *Open Economies Review*, 2021, **32**, (1), 37-69

Work on the supply-side and the UK originated with the creation of the Liverpool Model to explain UK unemployment in the 1980s:

Marwaha, S., Minford, P., Matthews, K. and Sprague, A. (1984). "The Liverpool macroeconomic model of the United Kingdom". *Economic Modelling* 1.1, pp. 24–62.

There is a large empirical literature on the effects of tax on growth worldwide, which is reviewed at length in Philip Booth (ed.) 'Sharper Axes, Lower Taxes', IEA, see Minford, P. and Wang, J., chapter 1, 'Public spending, taxation and economic growth- the evidence' which tests the tax-growth hypothesis versus the investment subsidies-growth hypothesis on 100 countries from 1970 to 2000. It finds the former to be validated while there is no support for the latter. In addition, it reviews a large number of studies which find that tax reduces growth. The summary table is reproduced below- for detailed references see chapter.

Other studies reviewing these issues can be found in Booth, P. (Ed.) IEA 'Taxation, government spending and economic growth' - see especially chapters 6-8, which review both the literature of cross-country studies over time ('panel studies') and recent Cardiff work on the UK specifically which was able to test a causal theory of tax/regulation on growth, as now embedded in our Regional model above.

Table: The Negative Impact of Taxation on Economic Growth

Author	Data coverage	Main explanatory variables	Comment
Barro (1991)	98 countries in the period 1960-85	Human capital, government consumption, political instability indicator, price distortion	1% point of GDP increase in tax-to-GDP ratio lowers output per worker by 0.12%.
Koester and Kormendi (1989)	63 countries for which at least five years of continuous data exist for the 1970s.	Marginal tax rates, average tax rate, mean growth in labour force and population.	10% decrease in marginal tax rates would increase per capita income in an average industrial country by more than 7%
Hansson and Henrekson (1994)	Industry-level data for 14 OECD countries	Government transfers, consumption, total outlays; education expenditure; government investment	Government transfers, consumption and total outlays have a negative impact on growth while government investment is not significant.
Cashin (1995)	23 OECD countries over the 1971-88 period	Ratio of public investment to GDP, ratio of current taxation revenue to GDP, ratio of expenditure on transfers to GDP.	1% point of GDP increase in tax-to-GDP ratio lowers output per worker by 2%.
Engen and Skinner (1996)	US modelling together with a sample of OECD countries	Marginal tax rates, human capital, investment.	2.5% point increase in tax-to-GDP ratio reduces GDP growth by 0.2% to 0.3%.
OECD - Leibfritz et al. (1997)	OECD countries over the 1965-95 period	Tax-to-GDP ratio, physical and human capital formation and labour supply.	10% point increase in tax-to-GDP ratio reduces GDP growth by 0.5% to 1%
Alesina et al. (2002)	18 OECD countries over the 1960-96 period	Primary spending, transfers, labour taxes, taxes on business, indirect taxes, government wage consumption (all in share of GDP).	1% increase in government spending relative to GDP lowers the investment-to-GDP ratio by 0.15%; cumulative fall of 0.74% after five years.
Bleaney et al. (2000)	17 OECD countries over the 1970-94 period	Distortionary tax, productive expenditure, net lending, labour force growth, investment ratio.	1% point of GDP increase distortionary tax revenue reduces GDP growth by 0.4% points.
Folster and Henrekson (2000)	Sample of rich OECD/non-OECD countries over 1970-95 period	Tax-to-GDP, government expenditure-to-GDP, investment-to-GDP, labour force growth, human capital growth.	10% point increase in tax-to-GDP ratio reduces GDP growth by 1%.
Bassanini and Scarpetta (2001)	21 OECD countries over the 1971-98 period	Indicators of government size and financing, physical capital, human capital, population growth.	1% point increase in tax/GDP ratio reduces per capita output levels by 0.3% to 0.6%.

For explanation of the method of indirect inference see:

Le, Vo Phuong Mai, David Meenagh, Patrick Minford, Michael Wickens, and Yongdeng Xu (2016). "Testing macro models by indirect inference: a survey for users". In: *Open Economies Review* 27.1, pp. 1–38.

Meenagh, David, Patrick Minford, Michael Wickens, and Yongdeng Xu (2019). "Testing DSGE models by Indirect Inference: a survey of recent findings". In: *Open Economies Review*, **30** (3), 593-620.



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