An Roinn Airgeadais
Department of Finance

Economic Insights
Economic Developments during Covid 19 and beyond

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Department of Finance

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Executive Summary

The first edition of Economic Insights published in January this year, addressed a number of surprising and topical trends in economic statistics during the pandemic, namely the elevated household savings rate, surging pharmaceutical exports, and recent complexities associated with labour market statistics. In this second edition of Economic Insights we continue the theme of the pandemic, this time focusing on economic developments through the lens of real-time data and the role played by the so-called automatic stabilisers. We also look beyond the pandemic to shed a light on the longer-term economic impact or 'scar' and the channels through which that might arise.

As set out in the first analytical note on real-time data in this bulletin, the Covid-19 crisis presented a challenge for those monitoring Ireland's economy. The unprecedented and rapid reversal of economic activity created significant data gaps in the analysis of economic developments. With official data released with significant lags and often subject to revisions, the Department began to monitor a number of high frequency 'real time' data sources that provided approximations for direction of travel in the economy. The effects of public health restrictions on economic activity throughout last year are reflected in the changes in mobility and payments data. These new data sources showed a dramatic fall off in activity during spring 2020 with the introduction of restrictions on activity. Subsequent sets of restrictions have not led to similarly large falls in activity, with some evidence that consumers and businesses have adapted to operating under Covid-19 restrictions.

The first line of defence in the face of any economic downturn is to 'let the automatic stabilisers operate', but what exactly does this mean? The second note in this bulletin seeks to briefly explore the concept of automatic fiscal stabilisers in the context of the Irish economy and the Covid-19 pandemic. Automatic stabilisers are features of tax and expenditure systems that reduce fluctuations in economic activity without a need for policy changes. Pre-pandemic analysis indicated that Ireland had relatively strong automatic stabilisers, particularly in relation to the role played by direct taxes on income. Fiscal stabilisation of household incomes in Ireland during the pandemic has been bolstered by exceptional policy measures, which are relevant to the emerging discussion on so-called 'second generation' automatic stabilisers. These are new fiscal instruments that provide a substantial counter-cyclical response when automatically triggered by a severe downturn. Future considerations in this area should reflect the innate relationship between automatic stabilisers and the other policy goals served by tax and expenditure systems.

The third analytical note considers the persistent or 'scarring' effects on the level of economic output caused by recessions. Economic shocks can affect the potential output of the economy - i.e. what the economy can supply given factors of production - shaping its long-term trend growth. This can occur both through the initial impact on the level of economic output, but also by affecting future growth rates. Since the pandemic has led to a severe global recession, a key question facing policymakers is the extent of scarring that may result. In this paper, we outline the transmission channels through which scarring may occur due to the COVID-19 pandemic and provide a summary of the evidence so far. Experience of past epidemics such as SARS, MERS, Ebola and Zika suggest that the initial impact on potential output was relatively short-lived. Similarly, following a sharp initial impact, exogenous events such as the 1970s oil embargo and wars saw an initial rebound with longer-term impacts that were more ambiguous. In contrast, financial crises are associated with a significant and very persistent downward shift in potential output. Whether the long-term impact of COVID-19 will resemble that of epidemics and other exogenous shocks (i.e. no scarring effects) or that of financial crises (i.e. persistent scarring effects) is uncertain.

Contents[1]

Figures and Tables

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[1]The data and analysis set out in this document are compiled by Department of Finance staff. Every effort is made to ensure accuracy and completeness. When errors are discovered, corrections and revisions are incorporated into the digital edition available on the Department's website. Any substantive change is detailed in the online version.

Chapter 1
The pandemic through the prism of high frequency indicators [2]

1.1 Introduction and background

The sudden and unprecedented restriction of economic activity during the Covid-19 pandemic spurred the growth of an already burgeoning literature using real-time high frequency data sources to track economic activity. Official economic statistics are released on a monthly or quarterly basis and with a significant lag, leaving holes in policymakers' knowledge of the rapidly changing dynamics precipitated by the pandemic. Much of this gap in understanding the economic effects of the pandemic has been filled with publicly available and private sector real-time data sources such as card payments and mobility data, facilitated by the widespread adoption of new technologies such as cashless payments and smartphones. This paper looks at the effect of public health restrictions in Ireland throughout 2020 through the lens of card payments and mobility indicators. It is found that the dramatic fall in activity first seen in Spring 2020 – as reflected in payments data and mobility data – does not seem to have been repeated in subsequent lockdowns triggered by rising levels of infection. Much of this is likely due to the more widespread adoption of new technologies by consumers and firms.

1.2 Developments in real-time data

Although use of high-frequency data has been brought firmly into focus during the Covid-19 pandemic, economists have for some time been seeking to better leverage the greater availability of so-called 'Big Data' to improve their understanding of economic developments. One strand of this literature are 'nowcasting' models that use higher frequency data to provide forecasts ahead of official releases of quarterly economic indicators, such as GDP (Giannone et al, 2008),[3] a method also adopted by the Department of Finance (Daly and Rehill, 2020).[4] However, these models typically depend on monthly data, still released with a lag and subject to revisions, making them less suited to the extreme shifts seen initially during the Covid-19 pandemic.

Aladangady et al (2019) were among the first to use ultra-high frequency (daily) payments data to understand real-time economic conditions during the 2019 U.S government shutdown.[5] In the absence of official statistics during this period, they were nonetheless able to provide robust estimates of consumption activity for the Federal Reserve. Using the same data in the context of Hurricanes Harvey and Irma they found little evidence that consumers subsequently make up for consumption foregone during the disaster. For the Covid-19 pandemic one of the most high profile uses of high frequency data

[3] Giannone, D., L. Reichlin, and Small, D. (2008). "Nowcasting: The Real-Time Informational Content of Macroeconomic Data." Journal of Monetary Economics 55, no. 4: 665–76.
[4] Daly, L. and Rehill, L. (2020). "Where are we now? Examining Irish Economic Developments in Real-Time." Department of Finance Working Paper.
[5] Aladangady, A., S. Aron-Dine, W. Dunn, L. Feiveson, P. Lengermann, and Sahm C. (2019), "From Transactions Data to Economic Statistics: Constructing Real-Time, High-Frequency, Geographic Measures of Consumer Spending." National Bureau of Economic Research.

was provided by Chetty et al (2020),[6] who built a public dashboard of economic indicators such as consumer spending, job postings and mobility from US private sector data. Significant regional variation in the impact of Covid-19 on consumer spending was observed in payments data. Wealthy households reduced their spending more heavily than those from lower income groups, with most of this reduction coming from goods and services that require physical interaction. The impact of state-imposed restrictions on economic activity such as lockdown policies and subsequent re-openings had modest effects on spending. Consumers in general had reduced their spending in advance of public health interventions.

In the UK, the greatest falls were observed in social and work-related spending, while spending on staples remained stable at or above its pre-pandemic baseline (Bank of England, 2020).[7] Significant differences in consumption across regions and the income distribution was found during national lockdown (Hacıoglu-Hoke et al, 2021),[8] with spending among London residents down by 45 per cent, while among Northern Ireland residents it fell by 16 per cent. Meanwhile limited declines in spending were associated with localised restrictions (Gathergood and Guttman-Kenny, 2021),[9] suggesting that a localised approach may limit the economic cost of public health restrictions. Andersen (2020) found that the vast majority of the fall in spending was common across Sweden and Denmark despite very different public health approaches, [10] implying that the reduction in activity was associated with the virus itself rather than with public health measures.

In an Irish context, Hopkins and Sherman (2020) analyse the decline in card payment spending seen during the initial lockdown of Spring 2020 using Central Bank of Ireland (CBI) daily card payments data. [11] They observe a sharper decline in ATM withdrawals than in Point-of-Sales spending, reflecting an apparent move away from cash during the pandemic that has been noted elsewhere (Cronin, 2021).[12] Byrne et al. (2020) find significant amounts of reallocation between sectors in the payments data,[13] with less spending on services relying on physical proximity and more spending observed on groceries and perishables. They also noted an initial increase in spending online that waned as the stringency of restrictions eased, suggesting that firms used online sales to mitigate the effects of the widespread closure of retail premises.

1.3 Data

The analysis in this paper uses data provided directly to the Department by financial technology company Revolut, which has over one million users Ireland. Although Revolut users tend to be younger than the population generally, spending per user in Ireland is strongly correlated with the CBI daily debit

[6] Chetty, R, J. Friedman, N. Hendren, M. Stepner, and The Opportunity Insights Team. (2020). "The Economic Impacts of COVID-19: Evidence from a New Public Database Built Using Private Sector Data." NBER.
[7] Bank of England (2020). Monetary Policy Report May 2020.
[8] Hacıoğlu-Hoke, S., D. R. Känzig, and P. Surico (2021), "The Distributional Impact of the Pandemic." European Economic Review.
[9] Gathergood, J., and Guttman-Kenney, B. (2021). "The English Patient: Evaluating Local Lockdowns Using Real-Time COVID-19 & Consumption Data."
[10] Andersen, A. Lau, E. Toft Hansen, N. Johannesen, and Sheridan, A. (2020). "Pandemic, Shutdown and Consumer Spending: Lessons from Scandinavian Policy Responses to COVID-19."
[11] Hopkins, A., and Sherman, M. (2021). "Shining a Light on Sectoral Spending Behaviours through the Most Recent Phases of the Pandemic." Behind the Data (blog).
[12] Cronin, D. (2021). "Whither Cash in Payments?" Quarterly Bulletin.
[13] Byrne, S., A. Hopkins, T. McIndoe-Calder, and Sherman, M. (2020). "The Impact of Covid-19 on Consumer Spending." Economic Letters 2020, no. 15.

card statistics that covers the vast majority of debit card payments in Ireland (Figure 1). Revolut categorise spending into a number of high-level categories, while the data also distinguishes between spending online and in-person as well as the spending of users by age category.

Figure 1: Revolut and Central Bank daily card payments, 7 day MA, indexed to March 2020
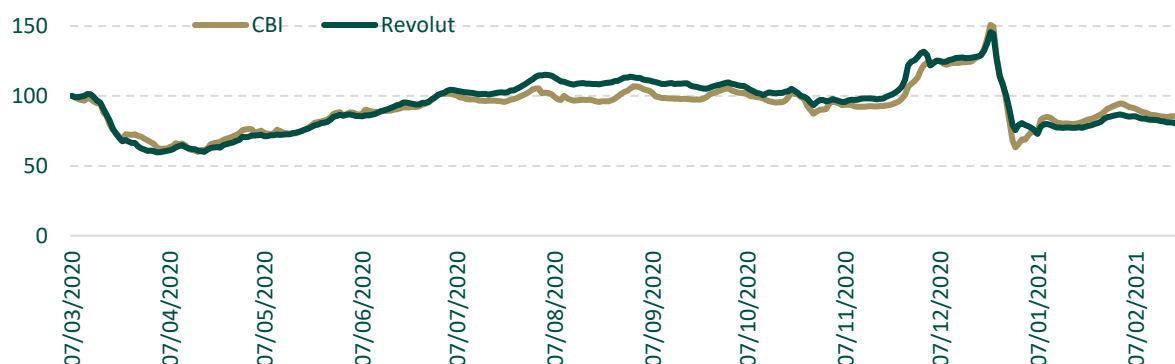
Source: Revolut, Central Bank of Ireland, Department of Finance calculations.
Note: R = 0.965

Mobility data from Google is also used. This is based on anonymized aggregated location history of users of Google services. Changes in visits to or time spent at categorised places are expressed relative to a baseline of the median value from the 5-week period January 3 – Feb 6, 2020. Seven-day moving averages of mobility indicators are used to smooth day-of-the-week effects. In looking at the effects of Covid-19 we mirror the approach of Woloszko (2020),[14] using the average of the 'Retail and Recreation' and 'Workplaces' categories as a proxy for economic activity.

Table 1: Chronology of major restrictions

Lockdown	Start date	Relaxation date	Oxford Stringency Index (peak)	Revolut Spending Index average (trough)	Google Mobility Average (trough)
Spring 2020	28/03/2020[15]	18/05/2020	90	-31 (-38)	-68 (-73)
Winter 2020/21 I	22/10/2020	01/12/2020	81	+5 (-3)	-40 (-50)
Winter 2020/21 II	24/12/2020[16]	-	(88)	(-25)	(-59)

Note: Revolut data indexed to February 2020 (=0). Google mobility data is average of activity at workplaces and retail and recreation categories; indexed to January/early February 2020 (=0).
Source: Google, Revolut, Oxford Blavatnik School of Government.

1.4 Spring 2020

In March 2020, Ireland began introducing its first significant public health restrictions in response to the spread of Covid-19. The first major set of restrictions were announced on 12 March, where schools were closed, mass gatherings were restricted and workers encouraged to work from home. Non-

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[14] Woloszko, N. (2020), "Tracking activity in real time with Google Trends", OECD Economics Working Papers, No. 1634
[15] Some restrictions had been in place since 14/03/2020.
[16] Restrictions were subsequently tightened on 31/12/2020.

essential retail and food service outlets were closed from 25 March. A general 'stay at home' order was introduced from 28 March with exceptions for exercise and essential activities. This most stringent period of restrictions remained in place until a phased easing of restrictions beginning on 18 May.

Following the introduction of restrictions there was an immediate sharp fall in both spending and mobility levels (Figure 2). The initial fall in activity occurred well ahead of the introduction of the most stringent measures on 28 March. This mirrored the experience in the UK and US, where activity fell before the introduction of formal lockdown measures.

Beyond falls in overall spending levels, there was considerable variation between sectors, age groups and spending medium in their responses to lockdown measures.[17] The largest sectoral falls were in those categories directly affected by public health measures like Restaurants, Transport and Travel. This reflects the near-total closure of these industries following restrictions. However sharp rises of over 200 per cent were noted in spending on retailers specialising in paints, hardware, and durable goods. Meanwhile, those aged 65 years and over showed a larger initial fall in spending levels than other cohorts, possibly reflecting the greater levels of caution among those most at risk of serious illness, as well as government advice for older people to 'cocoon' at home. The youngest cohort (18-24) also show a very large fall in spending levels, which may in-part reflect the disproportionate labour market impact on young workers (Roantree et al, 2020).[18] All age groups however experienced large and similarly timed initial falls in spending. Lastly, the share of spending taking place online rather than in-person rose dramatically during this period to close to 50 per cent of Revolut spending. At a regional level, there was little evidence of the regional variation noted in the UK by Hacioglu-Hoke et al (2021), with all counties recording similar falls in spending.

In line with the fall in consumption activity, mobility data show sharp declines following the introduction of restrictions. The mobility indicators reflect the early and sharp fall-off in activity after the initial introduction restrictions, ahead of more stringent 'lockdown' measures. Mobility levels continued to fall after spending levels had reached their trough.

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[17] See Department of Finance (2021). "Emerging economic developments - real-time economic domestic indicators, December 2020."
[18] Roantree, B. (2020). "Job Loss Distribution". Quarterly Economic Commentary Summer 2020, ESRI.

Figure 2: Mobility, spending and stringency
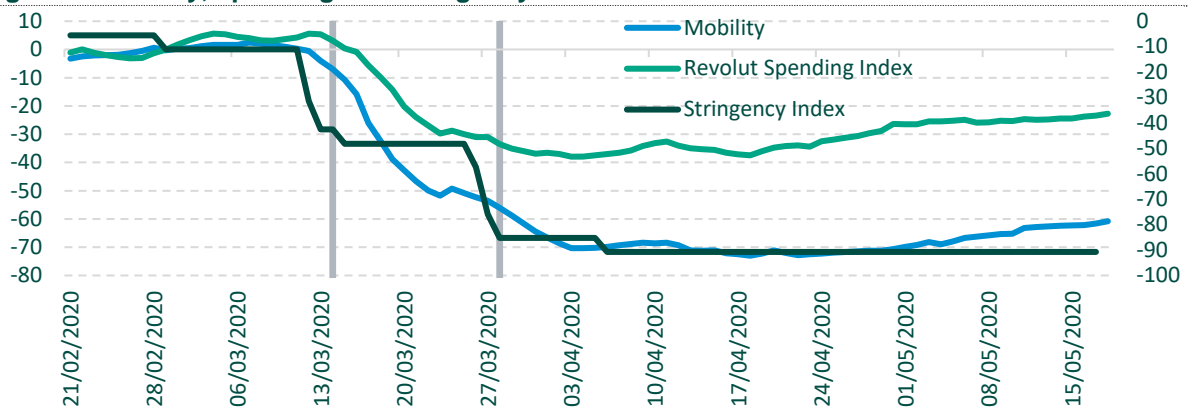
Source: Google. Revolut, Oxford Blavatnik School of Government.

Figure 3: a) Seven day average spending index per user, 20 April 2020 **b) Share of spending online and offline**
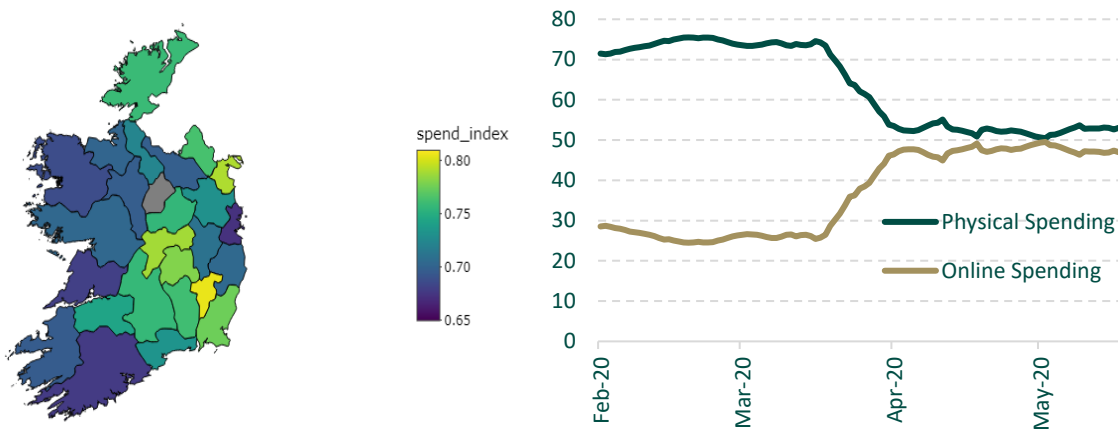
Source: Revolut, Department of Finance calculations.

1.5 Local Lockdowns

In summer and autumn 2020, a number of counties experienced increases in Covid-19 case numbers and restrictions were imposed at a county level. These restrictions were broadly similar between counties, involving inter alia the closure of hospitality businesses except for outdoor dining, together with restricting residents to travel only within their own county. Local restrictions in midlands counties were lifted after several weeks while those in Dublin and Donegal were superseded by more stringent national restrictions, as case numbers rose nationally.

Table 2: Chronology of local restrictions

Counties	Restrictions Introduced
Kildare, Laois, Offaly	04/08/2020
Dublin	15/09/2020
Donegal	25/09/2020
Cavan, Monaghan	15/10/2020

Source: Gov.ie

There does not appear to be an immediate change in overall spending levels from local restrictions, with any change in total spending levels certainly below the level seen during March and April, reflecting the less stringent local measures (Figure 4a). However consumption of hospitality services was severely impacted, as shown by Figure 4b. The fall in spending on these categories is obvious and coincides with the introduction of restrictions. This trend was more pronounced in the case of Dublin and Donegal, as the introduction of restrictions in midlands counties coincided with the late August bank holiday period.

Local lockdown measures also targeted mobility more generally, limiting residents to travel only within their own county. The CSO's *staying local indicator* showed increases in the proportion of the people in counties subject to restrictions remaining within 10 kilometres of home. This fall in mobility is however much more limited than that seen during the Spring period, which reflected the more relaxed measures on movement and the more widespread opening of businesses.

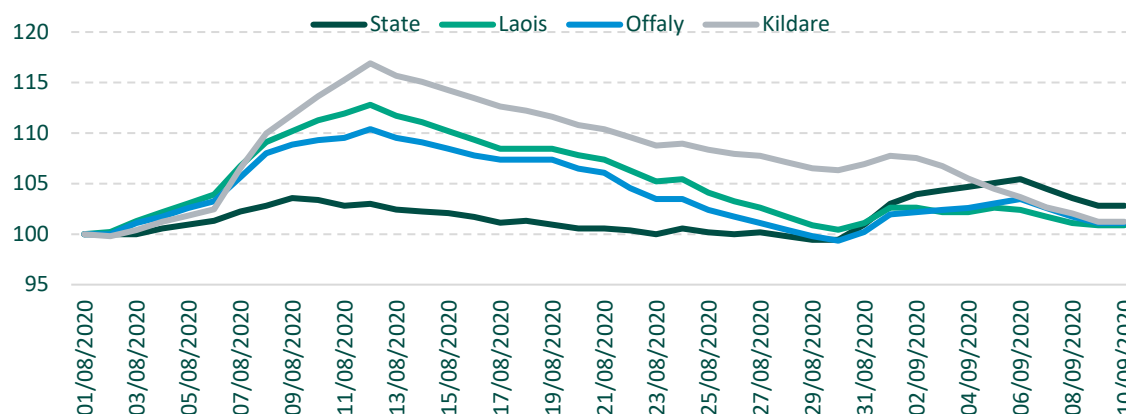**Figure 4: a) Overall spending,** indexed to February 2020 **b) Restaurants spending**
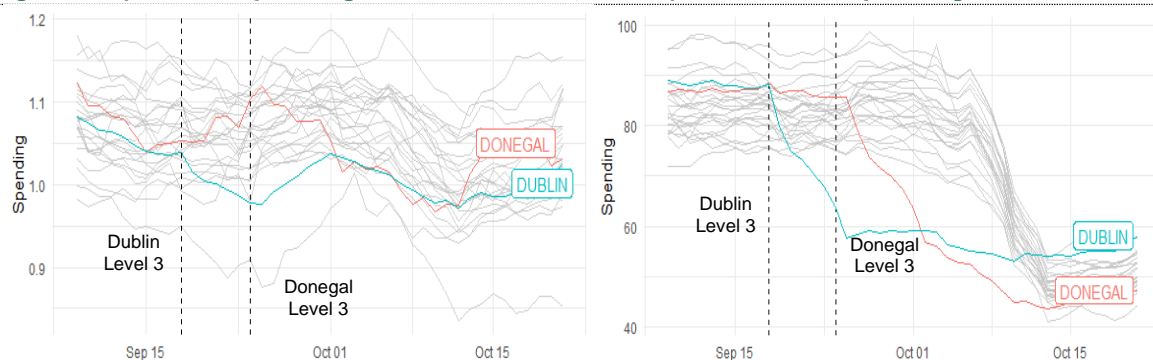
Source: Revolut, Department of Finance calculations.
Note: Counties with regional restrictions are highlighted and the date restrictions were introduced is marked

Figure 5: Population remaining within 10km of home, indexed to 1 August 2020

Source: CSO, Department of Finance calculations.

1.6 Winter 2020

As case numbers rose during October, further restrictions were imposed. Initially on 3 October all counties were placed on Level 3 of the Plan for Living with Covid-19, with the closure of indoor hospitality, before Level 5 was introduced on a national basis on October 22 for a period of six weeks. These restrictions were broadly similar to the most stringent lockdown measures introduced in the Spring, with a key difference being that schools and construction remained open during Level 5 restrictions.

The fall in spending observed following the reintroduction of restrictions was much smaller than the initial fall observed in the Spring. Spending in September, before the national restrictions, was above February levels, having been buoyed by the widespread re-opening of businesses and removal of restrictions over the summer. Overall spending during this period of restrictions remained close to or above pre-pandemic levels, with significant increases coinciding with Black Friday and Cyber Monday in late November. With non-essential retail closed, much of this spending took place online, making up the majority of spending on Revolut debit cards. Ahead of the introduction of Level 5 restrictions, there was a rise in spending in the Revolut '*Shopping*' category,[19] suggesting some anticipatory behaviour by consumers ahead of the closure of non-essential retail. Restaurant spending had already fallen significantly following the move to Level 3 restrictions nationally.

The return to Level 3 of the Government framework, with the widespread re-opening of retail, personal services and hospitality from 1 December onwards was immediately evident in payments and mobility data. Spending offline quickly overtook online spending, reaching 75 per cent of activity on Revolut cards in the run up to Christmas. Spending in the 'Restaurants' category was also noted as having risen rapidly, in line with restaurant booking data from OpenTable.[20] Activity at retail and recreation locations rose sharply throughout the month of December, reaching a peak just below its pre-pandemic baseline on December 23 before restrictions were re-introduced. The strong rise in spending in December

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[19] See Department of Finance (2021). "Emerging Economic Developments - Real-Time Economic Domestic Indicators."
[20] Ibid.

reflects both seasonal spending and potential pent-up demand following a period of stringent restrictions.

Figure 6: Mobility, spending and stringency
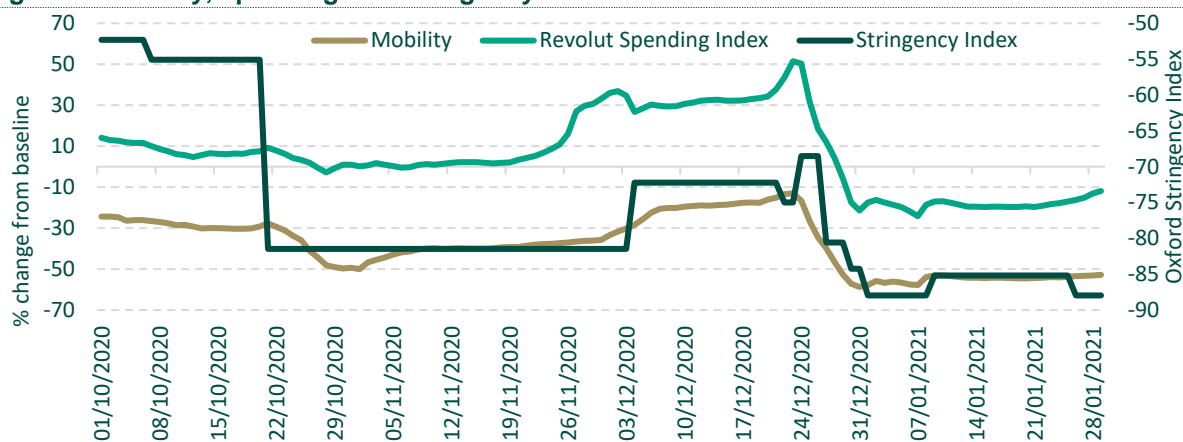
Source: Google. Revolut, Oxford Blavatnik School of Government.

Figure 7: a) Share of spending carried out online and offline b) Relative spending in budget categories
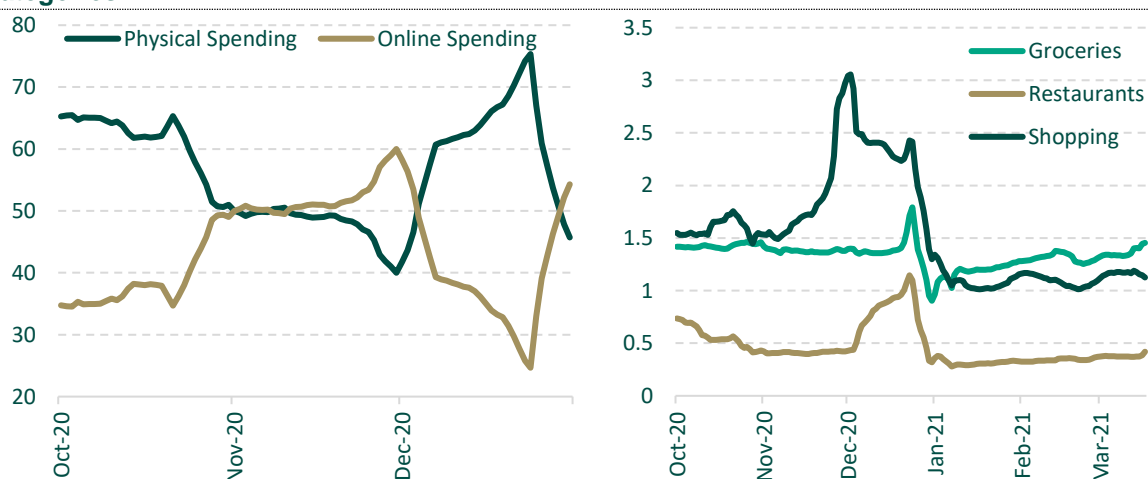
Source: Revolut.

1.7 Conclusion

The dramatic reversal of economic activity following the introduction of Covid-19 restrictions in 2020 has spurred the more widespread use of high frequency economic indicators as well as providing a number of lessons on the economic impact of public health restrictions.

The dramatic fall in activity seen during the initial lockdown of March and April 2020 and reflected in the indicators presented has not been repeated in subsequent restrictions and waves of infection. The more widespread adoption of new technologies and ecommerce by consumers and firms has likely cushioned the impact of subsequent bouts of restrictions. This was reflected in an increase in the numbers of Irish

firms accepting online payments as well as the share of consumer spending that is now taking place online,[21] suggesting there is potential for a boost to future productivity from this 'digital dividend'. The potential for further adaptation to lockdown measures is likely to be limited in industries dependent on physical proximity such as personal services and hospitality.

A novel feature of this work is the ability to analyse real-time expenditure at a regional and sectoral level in an Irish context. Unlike some international work, there is relatively little evidence of strong regional differences in spending levels during the lockdown of Spring 2020. Evidence from local lockdowns, which have played a relatively limited role in Ireland's response to Covid-19, show small responses in spending to new restrictions. Unsurprisingly however, spending in sectors directly affected by lockdown measures falls sharply relative to unaffected counties.

The public health situation remains unpredictable in 2021, with vaccination programmes ongoing and the emergence of new variants of the virus. High frequency indicators have proven their usefulness in 2020 as leading indicators that allow policymakers to assess the impact of restrictions and direction of travel in real time. Economists and forecasters will continue to monitor these indicators to monitor the impact of the unwinding of restrictions and any longer term behavioural changes that have emerged during the pandemic.

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[21] See Department of Finance (2020). "Emerging Economic Developments - Real-Time Economic Domestic Indicators 30 July 2020."

Chapter 2
Ireland's automatic fiscal stabilisers in context [22]

2.1　Introduction

This note aims to briefly explore the concept of automatic fiscal stabilisers in the current context of the Irish economy. The note begins with a brief description of automatic stabilisers, how they work and what purpose they serve. Section 2.3 discusses measures of automatic stabilisers and uses these estimates to place Ireland in an international context, before Section 2.4 discusses the role of automatic stabilisers in the economic policy response to the Covid-19 pandemic. Finally, Section 2.5 touches on the prospects for the development of automatic stabilisers as the economy moves beyond the pandemic, before Section 2.6 concludes.

2.2　Automatic stabilisers – what, how and why?

Automatic fiscal stabilisers can be defined as in-built features of government revenue and expenditure systems that act to smooth fluctuations in economic activity without the need for discretionary government actions.[23] Prominent examples of automatic fiscal stabilisers are elements of government revenues or expenditures that have a clear relationship to the level of economic activity such as spending on unemployment benefit transfer payments or tax revenue from taxes linked most closely to economic activity affected by the cycle – for example, falls in employment and incomes will lead to reduced revenues through income tax receipts.

What distinguishes automatic stabilisers from wider stabilisation policies is that their implementation does not require policy action. Governments can introduce countercyclical fiscal policy measures by making decisions to change aspects of taxation and expenditure through legislative action e.g. introducing new taxes, changing existing tax rates or bands, amending public spending plans, etc. These are considered *discretionary* policy measures, as a policy decision is required. Automatic stabilisers are inherent features of how the taxation and expenditure systems are designed and implemented, which means they work automatically as the level of economic activity rises or falls. No government decision is needed to bring the stabilising features into effect.

Automatic stabilisers fulfil an important macroeconomic function as they contribute to stabilisation policy, in other words, acting to smooth fluctuations in the level of activity in the economy. Allowing the automatic stabilisers to operate during a downturn has a negative impact on the public finances as revenues fall and spending increases. However, by increasing public spending and reducing the tax revenues being extracted from the economy, the macroeconomic effect works to support demand. Conversely, when output, employment, incomes and consumption are in an expansionary phase, automatic stabilisers work counter-cyclically by reducing government expenditure on income supports and increasing the amount of tax revenue taken out of the economy, thereby acting to slow the

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momentum of the cyclical upturn. This is particularly true for taxes such as income tax when they are progressive i.e. take a proportionally larger share of higher incomes.

As we have seen during the pandemic, governments may also implement stabilisation policy through enacting additional budgetary measures. However, while discretionary measures may be larger in size, the difficulty in quickly and appropriately designing and implementing such measures acts as a drag on their effectiveness. Conversely, the automatic stabilisation properties of taxation and expenditure systems are likely to be partial as these systems are designed and implemented with multiple policy objectives in mind.

2.3   Measures of automatic stabilisers in Ireland and elsewhere

Several methodologies exist for defining and estimating the size of automatic stabilisers. Three methods feature prominently in the literature.[24] The *microeconomic approach* typically uses household-level data and microeconometric techniques to investigate the impact of direct taxation and benefit systems on disposable income or consumption. The *macroeconomic approach* uses macroeconomic models to assess the stabilising role played by fiscal policy in response to an economic shock, allowing for both direct and indirect effects such as changes in consumer/firm behaviour or monetary policy. The *statistical approach*, on the other hand, uses the estimated response of the budget balance to cyclical changes in the economy (the cyclical component of the headline balance) as a measure of the size of automatic stabilisers. There is no clear consensus on any one of these methods being superior to the others.[25] Whatever the method used, estimates of the size of automatic stabilisers have varied considerably across countries, including within the EU and Eurozone.

The statistical method is widely used for surveillance of countries' fiscal policies, due to its relative simplicity. The key statistic for the statistical method is the fiscal 'semi-elasticity', which gives an estimate of how much the General Government Balance (GGB) to GDP ratio changes when the output gap changes by 1 percentage point. Within the statistical approach, different international organisations use different methodologies to estimate output gaps, and produce different estimates of semi-elasticities. Some recent (pre-pandemic) estimates of the semi-elasticity for Ireland are shown in Table 3 below. To take one example, using the Department of Finance's preferred approach to estimating the output gap,[26] when actual output in the Irish economy moves above potential output by 1 per cent, Ireland's GGB as a share of GDP increases by 0.59 per cent on average. Most of the estimates place the semi-elasticity for Ireland slightly above the averages for the respective country cohorts analysed, all of which are close to 0.5. These in turn are larger than the typical estimated size of automatic stabilisers in the US, for example, of 0.3-0.4.[27]

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[24] Mohl, P., Mourre, G. and Stovicek, K. (2019). "Automatic Fiscal Stabilisers in the EU: Size & Effectiveness." European Economy Economic Briefs, Brief 045, European Commission.
[25] The *size* of automatic stabilisers is also different conceptually from their *effectiveness* in reducing the volatility of macroeconomic aggregates e.g. total output.
[26] Department's GDP-based estimate of the output gap. See Murphy, G., Nacheva, M. and Daly, L. (2018). "Estimating Ireland's output gap; an analysis using selected statistical filters." Department of Finance.
[27] Bouabdallah et al. (2020).

Table 3: Pre-pandemic estimates of Ireland's fiscal semi-elasticity

	Ireland	Country group average
EU[28]	0.52	0.49 (EU28)
ESCB[29]	0.55 (approx.)	0.48 (Euro area)
OECD[30]	0.48	0.54 (Euro area)[30]
DFIN Preferred Approach	0.59[31]	N/A

Source: as stated in footnotes.
Note: The coefficients indicate the change in the ratio of the general government balance to GDP when the output gap changes by 1 percentage point.

These statistical estimates take a top-down approach, giving a broader picture of the overall automatic fiscal reaction to output fluctuations, based on movements in the budget balance. Microeconomic methods give a more sharply defined estimate, focused on direct taxes and transfers for the household sector.

Using the microeconomic approach, the extent of automatic fiscal stabilisation in Ireland is relatively high. The EU Commission, using EUROMOD simulations with 2014 data, find that Ireland is the second-highest-ranked member of the EU28 for the magnitude of stabilisation of both household income (c. 45 per cent) and consumption (c. 75 per cent), above the respective EU averages (c. 35 per cent and c. 70 per cent).[32] These results also show a very strong role for direct taxes as an automatic stabiliser of income for the highest income quintile – particularly so in Ireland – with social benefits playing a much larger role for the lowest income quintile.

Recent OECD work has sought to apply this focus on household income to aggregate data, [33] to assess the extent of changes in household disposable income resulting from shocks to household market income. Based on 2016 data, Ireland ranks 7th of 23 OECD countries for the strength of the simulated stabilisation response to an illustrative shock to household income,[34] through shocks to private sector employment and the total economy wage rate (see Figure 8 below). Once again in this analysis, and for Ireland in particular, direct taxes on income play the strongest role in stabilising household disposable income, more so than social security contributions or social benefits.

While Ireland's automatic stabilisers appear relatively large compared to other countries from cross-country comparisons *within* these measures, the direct comparability *across* such conceptually different measures of automatic stabilisers is limited. For example, EU Commission analysis shows only a small

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[28] Mourre, G., Poissonnier, A. and Lausegger, M. (2019). "The Semi-Elasticities Underlying the Cyclically-Adjusted Budget Balance: An Update & Further Analysis." European Economy Discussion Papers, No. 098, European Commission.

[29] Bouabdallah et al (2020). As the ESCB method incorporates the lagged budget response to macroeconomic shocks and the lagged effect of tax collections, the estimated semi-elasticities are expressed in cumulative terms over three years (T to T+2).

[30] Calculation by Bouabdallah et al. (2020), based on Price, R., Dang, T. and Guillemette, Y. (2014). "New Tax and Expenditure Elasticity Estimates for EU Budget Surveillance." OECD Economics Department Working Papers, No. 1174. Euro area figure is a weighted average and corrected for missing values for Cyprus, Lithuania and Malta.

[31] Semi-elasticity estimate from Carroll, K. (2019). "Estimating Ireland's Budgetary Semi-Elasticities", Analytical Note No. 12, Irish Fiscal Advisory Council.

[32] Mohl et al. (2019).

[33] Maravalle, A. and Rawdanowicz, Ł. (2020a). "How Effective Are Automatic Fiscal Stabilisers in the OECD Countries." OECD Economics Department Working Papers, No. 1635.

[34] In an alternative scenario analysed where unit elasticity of unemployment benefits with respect to the number of unemployed is assumed, Ireland ranks 5th of 23.

positive correlation between their chosen statistical and microeconomic measures.[35] Both microeconomic and macroeconomic modelling analyses of the type discussed here are sensitive to the exact type of shock simulated e.g. where a shock to market income takes place across the income distribution, whether a shock occurs in an area of the economy that provides substantial tax revenue such as personal consumption, etc. The precision of estimates using the statistical method is also subject to uncertainty due to the use of the output gap as a measure of the cycle and the estimation of a single response coefficient over a full time series of past data. In practice, the response of the budget balance to the cycle may change over time due to both differing types of economic shock and changes introduced to the tax and expenditure system.[36]

Figure 8: Share of household income shock offset by automatic stabilisers, selected countries (OECD analysis)
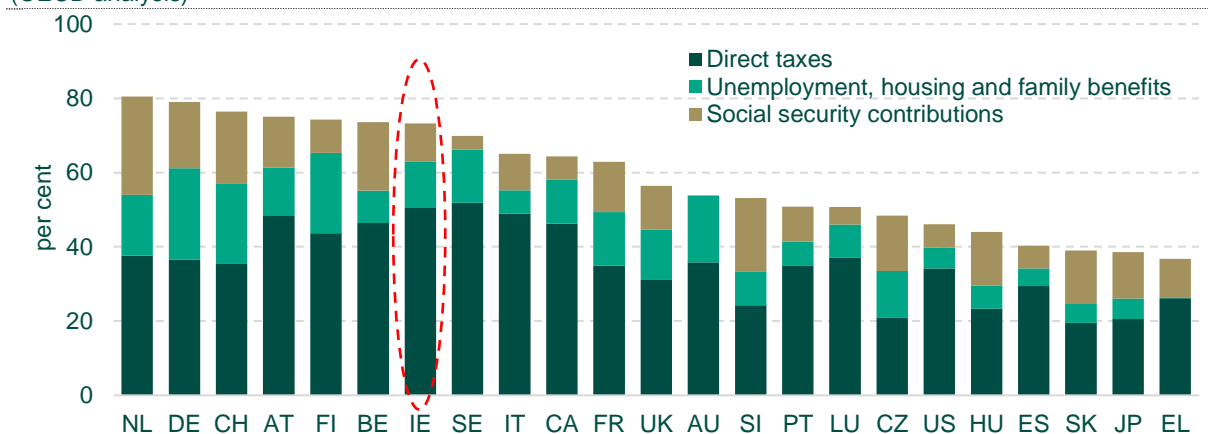
Source: Maravalle and Rawdanowicz (2020a), p.11.
Note: A result of 100 per cent would imply that the illustrative shock to household market income is fully offset by the automatic stabilisers, leaving disposable income unchanged.

2.4   Automatic stabilisers and counter-cyclical policy during the pandemic

The economic shock caused by the pandemic is unique in many respects, from the scale and speed of its impact to the specific nature of how economic activity has been curtailed. The fiscal policy response in advanced economies has been substantial,[37] and in Ireland specifically, the response has been strongly counter-cyclical. Recent ESRI analysis shows household incomes were significantly supported by direct and indirect tax and welfare policy measures during 2020, up to and including Budget 2021.[38] Within this, the role of automatic stabilisers has been somewhat different than during a typical downturn. Direct taxes on income, a very strong feature of automatic stabilisation of household income in Ireland using the measures shown in Section 2.3, have played a limited role during the pandemic, as evidenced in the resilience of income tax returns. Despite significant levels of unemployment in Ireland in 2020, the asymmetric nature of the shock meant total income tax returns for the year fell by just 1 per cent relative to 2019.[39] Numbers in receipt of the standard income support payments for those out of work,

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[35] Mohl et al. (2019). Graph 4, p.5.
[36] Indeed, Maravalle and Rawdanowicz (2020b) find the effect of tax policy changes in Ireland from 2000-2018 on the strength of automatic stabilisers related to direct taxes on household income was the second largest of 35 OECD countries analysed.
[37] IMF Fiscal Monitor Update, January 2021.
[38] Doorley, K., Keane, C., McTague, A., O'Malley, S., Regan, M., Roantree, B. and Tuda, D. (2020). "Distributional impact of tax and welfare policies: COVID-related policies and Budget 2021." ESRI Special Article, Economic and Social Research Institute.
[39] Department of Finance Fiscal Monitor, December 2020.

as captured by the Live Register, also rose only modestly in comparison to the impact from the Global Financial Crisis of a decade before. The supply-side aspect of the shock, whereby activity in certain sectors of the economy has been curtailed by public health restrictions, also limited the ability of fiscal policy to stabilise private consumption, which fell by approximately 9 per cent annually in 2020.

The strong support of fiscal policy for household disposable income in Ireland in 2020 reflects the introduction of exceptional discretionary measures to address the crisis. Some of these new measures, particularly Ireland's job retention scheme (Employment Wage Subsidy Scheme or EWSS) and the enhanced unemployment benefits of the Covid-19 Pandemic Unemployment Payment (PUP), either exhibit features similar to those of typical automatic stabilisers or may be understood as quasi-automatic fiscal instruments. Although these came about through discretionary policy decisions to redesign the tax and benefit system, they were introduced to ensure that the type of stabilisation function usually provided by the existing system was delivered despite the volumes of employees and firms in need of support rapidly increasing to extraordinary levels without any historical precedent. The introduction of the PUP by the Department of Employment Affairs and Social Protection (DEASP) was explicitly stated as being for this purpose,[40] with the number of claimants exceeding 500,000 within three weeks of its introduction. The use of these types of fiscal instruments in response to the pandemic has been common among euro area member states.[41]

These policy instruments have emerged in reaction to the pandemic, at a time when discussion had already been building on the potential merits of so-called 'second generation' automatic fiscal stabilisers. Given that monetary policy's effectiveness as a stabilising tool is constrained as interest rates reach and even exceed the zero lower bound, there is a need for fiscal policy to play a more active role in macroeconomic stabilisation than in recent decades.[42] The introduction of 'asymmetric',[43] 'quasi-automatic'[44] or 'semiautomatic'[45] fiscal stabilisers has been identified as one option to improve the effectiveness of fiscal stabilisation policy. These can be understood as fiscal tools specifically designed and implemented to provide macroeconomic stabilisation by increasing counter-cyclical support once automatically 'triggered by the crossing of a statistical threshold'[46] e.g. a certain level of unemployment. Examples of this approach were already in existence pre-pandemic, most notably in the US where some states had the capacity to extend the duration of unemployment benefits if economic conditions worsened.[47] The extreme nature of the pandemic shock has essentially forced governments to develop radical fiscal stabilisation capacity by rapidly incorporating these kinds of policy instruments (enhanced unemployment benefits, short-time work or wage subsidy schemes, tax deferrals, etc.) into their tax and expenditure systems.

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[40] See Covid-19 Introduction of simplified Unemployment Payments for employees and payments possible through employers, March 2020.
[41] Bouabdallah et al. (2020).
[42] Blanchard, O. and Summers, L. (2020). "Automatic stabilisers in a low-rate environment." PIIE Policy Brief 20-2, Peterson Institute of International Economics.
[43] Maravalle, A. and Rawdanowicz, Ł. (2020b). "Automatic fiscal stabilisers: Recent evolution and policy options to boost their effectiveness." OECD Economics Department Working Papers, No. 1636.
[44] Bouabdallah et al. (2020).
[45] Blanchard and Summers (2020).
[46] Ibid.
[47] Russek, F. and Kowalewski, K. (2015). "How CBO Estimates Automatic Stabilizers." Working Paper 2015-17, US Congressional Budget Office.

2.5   What is the future for automatic stabilisers?

With the arrival and steady rollout of safe and effective vaccines, there has been growing focus on fiscal issues that will emerge as the pandemic recedes. The European Commission's recent communication on the fiscal policy response to Covid-19 emphasised the clear risk facing Member States in withdrawing fiscal support prematurely i.e. before the recovery in private demand and activity is well established. [48] The Commission highlight that the risks associated with such action are greater than the risks associated with keeping fiscal support in place for too long. In keeping with the typical operation of automatic stabilisers, the goal for fiscal policy is to respond smoothly and proportionally as the economy moves from downturn to upturn.

Certain elements of the fiscal policy response during the pandemic could potentially be reflected in the further development or formalising of quasi-automatic or asymmetric automatic stabilisers. The possible introduction of any such fiscal instruments would need to carefully consider all factors at play. The operation of automatic stabilisers exists as part of a nexus between automatic and discretionary fiscal policy, debt sustainability, and macroeconomic stabilisation policy. The literature makes it clear that policy options for the design of automatic stabilisers involve trade-offs, for example between equity and efficiency (to take one such example, generous unemployment benefits can help to alleviate inequality, but can disincentivise employment). Automatic stabilisers are part of the overall fiscal architecture in an economy, and taxation and public expenditure systems serve multiple policy goals, whether ensuring the collection of sufficient revenue to resource the provision of public goods and services, combating economic inequality, or stimulating economic growth.

New policy instruments explicitly designed for stabilisation purposes would not be exempt from these constraints. For example, such measures may be designed to operate in an 'asymmetric' manner, by only increasing the government deficit during a (severe) downturn rather than responding proportionally to all stages of the cycle. Effective operation of these instruments thus clearly depends on either sufficient fiscal buffers already being built up during good economic times, or the existence of benign conditions that allow for increased public debt e.g. accommodative monetary policy. Such instruments would also have to operate based on clearly defined and appropriate metrics of economic activity, to ensure transparency and predictability. A final necessary consideration is that automatic stabilisers can only effectively address *cyclical* fluctuations, not *structural* shocks i.e. permanent changes to the 'natural' level of economic activity.[49] Identifying this level – potential output – is difficult, particularly in the unique context of the current pandemic shock.

Whether looking to the near term or beyond, clear, timely and reliable data on levels of economic activity will be needed to assess the operation of fiscal stabilisers. However, the pandemic has posed a challenge on this front with measurement issues apparent in the unemployment rate,[50] a statistic often highlighted as a desirable trigger for asymmetric stabilisers. To this end, a range of indicators (including

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[48] Available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_884
[49] Bouabdallah et al. (2020).
[50] Department of Finance (2021). "Ireland's Unemployment Rate and COVID-19 Disruption." Economic Insights – Economic Statistics during COVID-19, pp.18-24.

new, high-frequency indicators) will likely be needed to fully assess economic conditions.[51] Some progress has already been made, for example through the work on high-frequency indicators seen elsewhere in this publication, and further advances in this area will be of particular interest as the effort to calibrate fiscal stabilisation policy continues through the pandemic recovery.

2.6 Conclusion

This note has sought to briefly explore the concept of automatic fiscal stabilisers, in the context of Ireland's standing relative to other comparable economies and the economic consequences of the Covid-19 pandemic. Automatic fiscal stabilisers are essentially inherent features of the tax and expenditure systems within economies that reduce fluctuations in economic activity by bringing about changes in levels of government revenue or expenditure which work to counteract cyclical economic downturns or upturns, without a need for discretionary policy changes. The automatic nature of the stabilising features is central to their effectiveness, though automatic stabilising properties are only one factor in the design and implementation of tax and expenditure systems. There are multiple methods used in the economic literature to estimate the size of automatic stabilisers, with each method having its own merits and drawbacks. Pre-pandemic analysis by the European Central Bank, EU Commission and OECD indicated that Ireland has relatively strong automatic stabilisers, particularly in relation to the role played by direct taxes on income.

During the pandemic, fiscal stabilisation of household incomes in Ireland has been bolstered by exceptional policy measures brought in to combat the economic impacts of Covid-19 (particularly PUP and EWSS), beyond the effects of conventional automatic stabilisers. Such new fiscal instruments are relevant to the emerging discussion on the need for fiscal policy to play a stronger role in macroeconomic stabilisation, including through the introduction of 'second generation' automatic stabilisers that provide a substantial counter-cyclical response when automatically triggered by a severe downturn. Any future consideration of such fiscal instruments, however, should reflect the innate relationship between automatic fiscal stabilisers and the other policy goals served by tax and expenditure systems.

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[51] Shearing, N. (2021). "Fiscal policy and the post-COVID-19 recovery – A roadmap for domestic policy and international coordination." Chatham House Briefing Paper.

Chapter 3
Scarring effects[52]

3.1   Introduction

Recessions can cause persistent or 'scarring' effects on the level of economic output. Economic shocks can affect the potential output of the economy - i.e. what the economy can supply given factors of production - shaping its long-term trend growth. This can occur both through the initial impact on the level of economic output, but also by affecting future growth rates (see Figure 9). Given the COVID-19 pandemic has led to a severe global recession, a key question facing policymakers is the extent of scarring that may result. In this paper, we outline the transmission channels through which scarring may occur due to the COVID-19 pandemic and provide a summary of the evidence so far.

Figure 9: Stylised representation of possible scarring to potential output following COVID-19
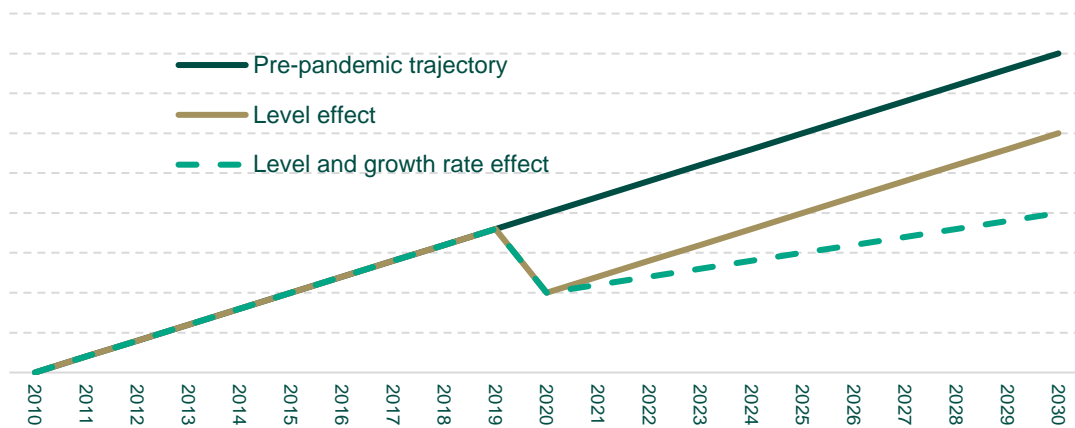
Source: Department of Finance based on Fernald and Li (2021)[53]

As COVID-19 constitutes an unprecedented global shock, its potential scarring effects are difficult to predict. First, the shock is multi-layered, with the public health emergency compounded by an induced supply shock (i.e. following the adoption of lockdown measures) and a demand shock as a consequence of increased unemployment and heightened uncertainty. Second, it has triggered a multifaceted and sizeable policy response, which has alleviated the adverse effects on economic activity but could raise concerns about public and private debt overhangs. Finally, certain sectors have been hit particularly hard by the lockdown measures and the behavioural changes on the part of consumers, which are likely to remain in place at least until vaccine programmes are effective enough for the grip of the pandemic to be loosened. These features make it difficult to compare directly to past crises.

Figure 10 shows the impact of different types of crises in the past on global potential output. Experience of past epidemics such as SARS, MERS, Ebola and Zika suggest that the initial impact on potential output was relatively short-lived, tending to dissipate two years after the end of the epidemic. Similarly,

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[52] This note was prepared by Luke Rehill and Éamonn Sweeney, economists in the Economics Division of the Department of Finance. The analysis and views set out are those of the authors only and do not necessarily reflect the views of the Department of Finance or the Minister for Finance. Any outstanding errors or omissions remain those of the authors.
[53] Fernald, J. and Li, H. (2021). "The Impact of COVID on Potential Output", Federal Reserve Bank of San Francisco.

following a sharp initial impact, exogenous events such as the 1970s oil embargo and wars saw an initial rebound with longer-term impacts (i.e. beyond four years) that were more ambiguous with wide confidence intervals. In contrast, financial crises are associated with a significant and very persistent downward shift in potential output, with a loss of around 5 per cent even after eight years. Whether the long-term impact of COVID-19 will resemble that of epidemics and other exogenous shocks (i.e. no scarring effects) or that of financial crises (i.e. persistent scarring effects) is uncertain.

Figure 10: Scarring effects of past epidemics and other crises on potential output levels
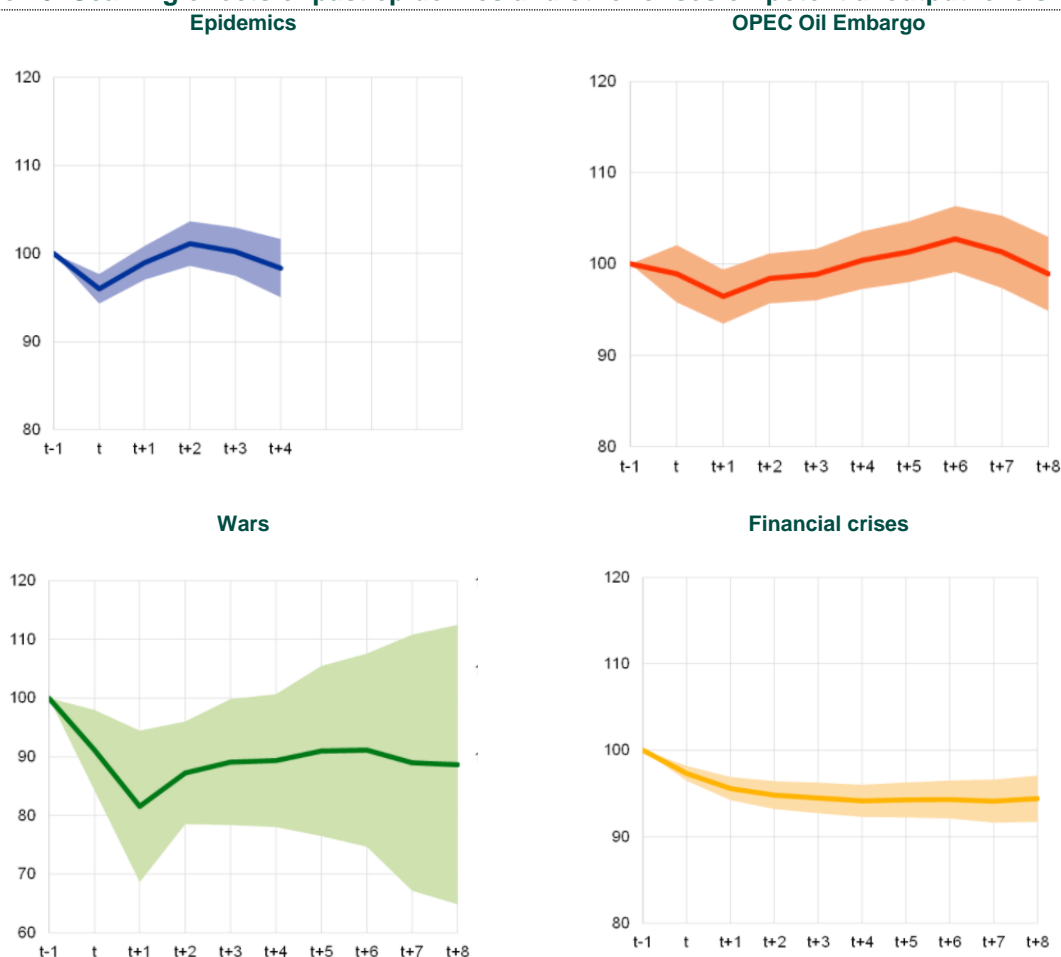
Source: Fuentes and Moder (2021).[54]

In the near term, COVID-19 is likely to reduce the level of potential output through its effects on the labour market and the capital stock, as well as the way in which these factors are used (i.e. productivity). However, depending in part on how long the downturn continues, there is also the risk of 'scarring' the growth rate of these. We next discuss how these individual components of potential output might be affected.

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[54] Fuentes, N.M. and Moder, I. (2021). "The scarring effects of past crises on the global economy." Economic Bulletin Boxes, 8.

3.2 Transmission channels

3.2.1 Capital

COVID-19 could negatively affect the stock of productive capital in the economy in a number of respects. First and foremost, despite supportive financing conditions, the high level of uncertainty could adversely affect investment decisions. Uncertainty is the enemy of investment and affects the discount rate on future returns. With uncertainty around future economic prospects and global demand in the near term, businesses may have postponed investment decisions until after the crisis. Using business survey data in the U.S Meyer et al (2021) note that the pandemic precipitated record levels of economic uncertainty, finding that Covid-19 induced uncertainty led business to reduce their planned capital expenditure by a sales weighted average of 12 per cent.[55] Similarly, Zalla's (2017) index of economic policy uncertainty for Ireland reached a record high in May 2020 and has remained elevated since.[56]

Capital depreciation is also likely to have increased as a result of COVID-19, especially in capital-intensive sectors hit by the crisis such as the airline industry, where parts of the capital stock could become obsolete. Other sectors, for instance those that depend on international tourism or physical proximity may also see a loss in the value of their capital stock should the pandemic induce lasting changes in preferences (Kozlowski et al, 2020).[57] Some machinery and equipment are extremely specialised and cannot be re-deployed from declining to expanding sectors. Despite these, there may be some upsides to the capital stock arising out of investment necessitated by the pandemic such as in health infrastructure or technology and automation. Evidence from the UK suggests that the majority of businesses invested in new technologies during the pandemic (Bloom et al, 2020),[58] however such effects are unlikely to outweigh foregone investment.

3.2.2 Labour

As the COVID-19 shock has above all hit labour-intensive sectors, the initial impact on labour supply could be stronger compared with past financial crises. With the exception of transport, the sectors most affected by the COVID-19 containment measures (i.e. retail trade, accommodation and food services, entertainment and recreation) tend to be more labour than capital-intensive. In addition to this, even sectors not targeted by the lockdown measures may have been hit indirectly through reduced sales of intermediate goods to affected sectors.

Whether employment losses will become more permanent will depend on the speed of the reallocation of workers across sectors and firms. A reduction in the labour force due to an increase in the number of discouraged workers or more limited global migration flows, could lead to a sustained contraction in the labour force. In the long run the disruption to education, as well as skill accumulation through worker-

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[55] Meyer, B.H., Prescott, B. and Sheng, X.S. (2021). "The impact of the COVID-19 pandemic on business expectations." International Journal of Forecasting.
[56] Zalla, R. (2017). "Economic policy uncertainty in Ireland." Atlantic Economic Journal, 45(2), pp.269-271.
[57] Kozlowski, J., Veldkamp, L. and Venkateswaran, V. (2020). "Scarring body and mind: the long-term belief-scarring effects of Covid-19." (No. w27439). National Bureau of Economic Research.
[58] Bloom, N., Bunn, P., Mizen, P., Smietanka, P. and Thwaites, G. (2020). "The impact of Covid-19 on productivity." (No. w28233), National Bureau of Economic Research.

to-worker learning may have an effect that reduces human capital accumulation. The literature shows that an individual's re-employment probability declines rapidly with every additional quarter of unemployment, with re-employment from spells of long term unemployment extremely low due to loss of skills over time.[59] At the same time, it should be recognised that the losses depend on the policy response and the success of labour market activation policies in mitigating these effects.

3.2.3 Productivity

The final channel of potential output growth, productivity (i.e. the efficiency with which labour and capital are utilised), may be affected in a number of ways.

First of all, the impact of COVID-19 could temporarily lock resources (i.e. capital and labour) in unproductive sectors, with the reallocation of productive resources towards fast-growing industries likely to take time. Secondly, financial distress might increase the financing cost of new, productive projects and might also increase corporate default rates. The destruction of jobs resulting from a surge in firm exits would potentially lead to productivity losses if reallocation of displaced workers to other firms is slow and results in a deterioration of workers' skills in the long run (known as hysteresis).

In addition, innovation could be impaired through lower spending by firms on research and development owing to the prolonged period of elevated uncertainty. Furthermore, reshoring of global value chains in the aftermath of the COVID-19 crisis could hamper innovation and knowledge spillovers across countries. This might be exacerbated if the current pandemic increases protectionism and accelerates de-globalisation. If this is the case, sectors that have greatly benefited in terms of productivity growth from international exposure and globalisation might experience a decline in trend TFP.

On a more positive note, there may be a 'digital dividend' spurred by the COVID-19 crisis via the increased use of technologies, which may accelerate the digital transformation of the economy and contribute positively to productivity.[60] There may also be a longer term boost to productivity if unviable, less productive companies, so-called 'zombie firms' exit and their resources move towards more productive firms. The evidence so far of a cleansing impact has been positive, with Syverson (2021) highlighting that business formation in the US has been stronger than previous years,[61] while firm-level data from the UK also shows a reallocation of resources to more productive firms.[62]

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[59] Conefrey, Thomas & McCarthy, Yvonne & Sherman, M. (2013). "Re-employment Probabilities for Unemployed Workers in Ireland." Economic Letters 06/EL/13, Central Bank of Ireland.
[60] Data from Stripe has shown an increasing number of firms have begun accepting payments online in Ireland – see Department of Finance (2020), "real-time domestic indicators".
[61] Bighelli, T., Inferrera, S., di Mauro, F. and Syverson, C. (2021). "Covid and Productivity one year after: what did surprise us?"
[62] See Bloom et al. (2021).

Table 4: Summary of potential channels of scarring

	Transmission channel	Impact on potential growth
Labour	Migration	-
	Labour supply	-/+
	Education/training	-/+
Capital stock	Investment	-/+
	Social distancing	-
Productivity	Within firms	-/+
	Between firms	-/+
	Reallocation	-/+

See: Mauro, F., and Syverson, C. "The COVID Crisis and Productivity Growth." VoxEU.Org (blog), April 16, 2020.
Young, G. "Covid-19: Deficits, Debt and Fiscal Strategy." Presented at the Institute for Fiscal Studies (IFS) and the National Institute of Economic and Social Research (NIESR) (Webinar), July 1, 2020.

3.3   Evidence so far

A number of international institutions have published forecasts about the level of potential output scarring that is expected to result from the pandemic. Even within specific forecasts there remains considerable uncertainty around the long term effects of Covid and few forecasters break down the scarring of potential output into its sub components.[63] A selection of estimates from different countries are presented in Table 5 below, with most institutions assuming a permanent loss to GDP in the region of 3 per cent. More recent estimates such as those from the IMF World Economic Outlook (April 2021) suggest that the faster than expected development of vaccines and rollout may mitigate against a significant level of scarring if the need for reallocation of workers is reduced.

Table 5: Selected estimates of medium-term scarring to GDP

Country/Region	Institution	Scarring Estimate (per cent)
United Kingdom	OBR	3
	Bank of England	1.8
	NIESR	4
Italy	Ufficio Parlamentare Di Bilancio,	3
Germany	Stabilitätsrat	3
Netherlands	CPB	3
United States	Within firms	3.4
Advanced Economies	IMF	1
World	IMF	3.3

Source: Office for Budget Responsibility, Ufficio Parlamentare Di Bilancio, Stabilitatsrat, CPB Netherlands, Congressional Budget Office and IMF World Economic Outlook
Note: Relative to a pre-pandemic baseline, unless otherwise stated.

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[63] See Fernald and Li (2021) for summary of the detailed channel impacts on potential output, with quantitative estimates for some.

Turning the focus to Ireland, recent evidence (Central Bank, 2020) highlighted that the insolvency rate in fact fell in April of last year due to the temporary inability of company directors to convene creditors' meetings safely.[64] Although this returned to pre-pandemic trends over the summer and despite indications of significant financial distress among firms, there is still no evidence of an increase in insolvencies. This is in part due to the cumulative effect of government supports, loan payment breaks, forbearance from other creditors, and pre-existing financial buffers having likely held down the insolvent liquidation rate. The challenge going forward will therefore be the timing of when to remove such supports, with a large percentage of viable firms estimated to be at high risk of becoming insolvent in the absence of these.[65] It follows that the ultimate effect on the level of potential output may depend on the countercyclical effects of policy such as these as well as the income supports that seek to limit the depth of the pandemic-induced downturn.

[64] McGeever, N., Sarchi, C. and Woods, M. (2020). "Irish company births and insolvent liquidations during the COVID-19 shock." (No. 13/EL/20), Central Bank of Ireland.
[65] Demmou, L., Calligaris, S., Franco, G., Dlugosch, D., McGowan, M.A. and Sakha, S. (2021). "Insolvency and debt overhang following the COVID-19 outbreak: Assessment of risks and policy responses."