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SOVEREIGN DEBT AFTER COVID-19: HOW THE INVOLVEMENT OF THE ECB CAN IMPACT THE RECOVERY PATH OF A MEMBER STATE

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ABSTRACT

The likely substantial impact of COVID-19 related measures on the public finances of European countries has prompted an unprecedented call for new and significant policies at a European level to alleviate the pressures on individual Member States. The administrative closures adopted across most economies has resulted in a complete cessation of certain types of economic activity, a significant increase in unemployment and profound fiscal challenges for the countries in question. In this paper we use a SOE-DSGE model to assess the role the ECB can play in mitigating the negative economic and fiscal effects of the crisis for Ireland by participating directly in the sovereign debt management of the country. Our results indicate that the direct involvement of the ECB via sovereign bonds purchases increases the efficiency of the extraordinary fiscal stimulus packages that were put in place to combat the negative impact of COVID-19. A fiscal stimulus at the national level backed by ECB financing reduces the output losses in the first year which would otherwise occur. The reduction in the output loss ranges from 0.5 per cent to 0.7 per cent depending on the mix of fiscal policies chosen by the State. The cumulative reduction in output loss over a five-year horizon could sum to 1.4 per cent to 2.2 per cent depending on the fiscal policy mix chosen.

1. INTRODUCTION

The emergence of COVID-19 in 2020 has prompted governments across Europe to adopt a range of extraordinary lockdown measures. While necessary from a health perspective, the cumulated impact of these measures has resulted in unprecedented economic fallout, with millions of workers across Europe being made unemployed. To mitigate the negative impact of the pandemic, governments across Europe have also initiated extraordinary fiscal responses at a national level. In Ireland this has included the introduction of wage support schemes, subsidies for business and COVID-19 related unemployment payments.² These significant expenditure measures coupled with the expected fall in taxation receipts due to the decline in

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² See *Taking Stock: The Fiscal Response to Covid-19*. Irish Department of Finance, November 2020.

economic activity will result in the Irish government encountering substantial fiscal challenges this year, with key metrics such as the General Government Balance and debt-to-GDP ratios set to be adversely impacted.

As the spread of the virus puts pressure on the public finances of countries across Europe, the issue of whether European institutions should provide more support to Member States has come to the fore. In this context a number of different options have been advanced. Blanchard (2020), for example, called for the ECB to act directly and buy Italian bonds. Whelan (2020) endorsed the proposal by Gros and Mayer (2012) that the European Stability Mechanism (ESM) should be provided with a liquidity backstop by having it registered as a bank. Alesina and Giavazzi (2020) called for the ECB to lift, temporarily, the constraints on its asset purchase programme and in particular the capital key. Furthermore, Alesina and Giavazzi (2020) suggested that the additional expenditure required by Member States to address the COVID-19 issue should be part of an EU programme. Bénassy-Quéré et al. (2020) and Gourinchas (2020) both supported a debt-financed fiscal stimulus at the European level.

This article has two main aims. The first is to examine the impact of the unfolding pandemic crisis on the Irish economy. The second is to assess the role the ECB can play in mitigating the negative demand and supply effects of the crisis for a particular Member State by participating directly in the sovereign debt management of that country.³ It is not our intention to recommend the most effective or preferable form of European intervention but to demonstrate the impact a particular form of intervention would have on the recovery path of the Irish economy.

To conduct this exercise, we utilise the small open economy dynamic stochastic general equilibrium (SOE-DSGE) model calibrated for Ireland developed in Varthalitis (2019).⁴ The model is extended in three ways. First, we introduce demand and supply shocks in the model so as to gauge the adverse impact of the pandemic in key macroeconomic aggregates of a small open economy member of Eurozone. A significant economic fallout has already occurred in Ireland (see e.g. McQuinn et al., 2020). Second, we develop the fiscal block of the model so as to incorporate a set of extraordinary fiscal instruments that are used by national fiscal authorities to mitigate the negative effect of the pandemic. Third, and, perhaps more importantly, we study the impact of the ECB directly intervening in the debt management of a

³ There is a growing literature that extends medium scale DSGE models used for policy analysis to study the macroeconomic and policy implications of the pandemic. Some examples include Bayer et al. (2020), Faria-e-Castro (2020) and Hagedorn and Mitman (2020).

⁴ FIR-GEM is a small open economy DSGE model for Ireland. Since the structure of the model is thoroughly analysed in Varthalitis (2019), in this paper we mostly focus on the extensions and the policy implications.

Member State economy. This is accomplished by enhancing a SOE model to add a union-wide policymaker that can directly intervene in the debt management of the domestic economy.

Under our policy experiment, we assume that two policy authorities can intervene in the economy of a member of a currency union, the national fiscal authority (the treasury) and a supra-national policymaker (the ECB). The role of the treasury is to finance its government expenditure, conventional and extraordinary, by levying taxes and/or issuing sovereign bonds. The role of the ECB, under our experiment, is to buy sovereign bonds from the Member States and set the union-wide interest rate. Each Member State's public debt can now be held by two types of institutional creditors, private markets and/or the ECB. Therefore, with such a policy the ECB can generate additional fiscal space for the national governments in the short to medium run. The timing of when these bonds will start impacting domestic public finances depends on the purchasing policy of the ECB.

In terms of the impact of the pandemic shock, we consider two possible outcomes. One outcome involves the impacts of the outbreak fading swiftly with economic activity, as a consequence, recovering quite quickly. We refer to as the 'V-shaped' recovery. We also consider an outcome where the pandemic endures and, thus, the adverse effects on the economy are more prolonged. This is referred to as the 'long-lasting' outcome. We calibrate the magnitude of the pandemic shock so as to mimic the expected fallout in some key macroeconomic aggregates reported in McQuinn et al. (2020).⁵

Our results indicate that the direct financial assistance of the ECB via sovereign bonds purchases increases the efficiency of the extraordinary national fiscal stimulus packages. A fiscal stimulus at the national level backed by ECB financing reduces the output losses in the first year which would otherwise occur. The reduction in the output loss ranges from 0.5 per cent to 0.7 per cent depending on the mix of fiscal policies chosen by the Member State. The cumulative reduction in output loss over a five-year horizon could sum to 1.4 per cent to 2.2 per cent depending on the fiscal policy mix chosen and the size of the fiscal stimulus. In terms of national policy, we find that extraordinary expenditures such as spending related to enhanced public health, labour income, subsidies and/or cash transfers targeted to financially constrained households perform better in countering the negative economic impacts of the lockdown. Fiscal packages should target households with no other sources of income and, thus, with a higher propensity to consume. Our article contributes to

⁵ The current analysis is subject to uncertainties due to the unexpected and novel nature of the COVID-19 pandemic.

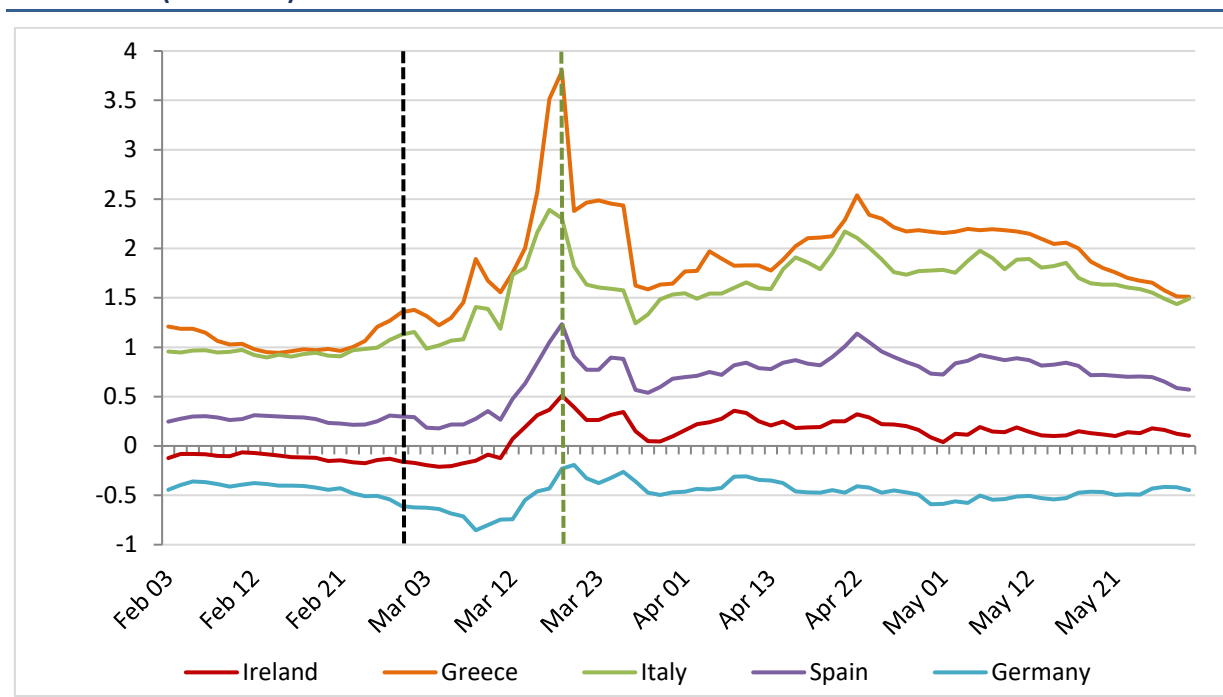
the growing literature that extends medium scale DSGE models used for policy analysis to study macroeconomic and policy implications of the pandemic.

The rest of the paper is structured as follows; in Section 2 we look at the role that could be played by ECB institutions in sharing the debt of Member States. Section 3 develops the extensions of the model. Section 4 presents the main scenarios simulated. Section 5 explains our results and Section 6 outlines some concluding comments. For the technical analysis see McQuinn and Varthalitis (2020).⁶

2. INCREASED ROLE FOR THE ECB SHARING THE DEBT OF MEMBER STATES?

At the onset of the crisis, the ECB acted swiftly to support Member States through accommodative monetary policy. Through the Pandemic Emergency Purchase Programme (PEPP) the ECB will purchase €1.35 trillion worth of sovereign government debt up to the end of June 2021 or when the COVID-19 ‘crisis phase’ is deemed to be over. This has helped alleviate market fears of default for Eurozone countries, in turn keeping borrowing costs down (see Schnabel, 2020). Figure 1 shows that the initial increase in yields experienced by some Eurozone countries at the start of the pandemic have largely fallen back to pre-pandemic rates.

FIGURE 1 GOVERNMENT BOND YIELDS SELECTED EUROZONE COUNTRIES DAILY FREQUENCY (PER CENT)



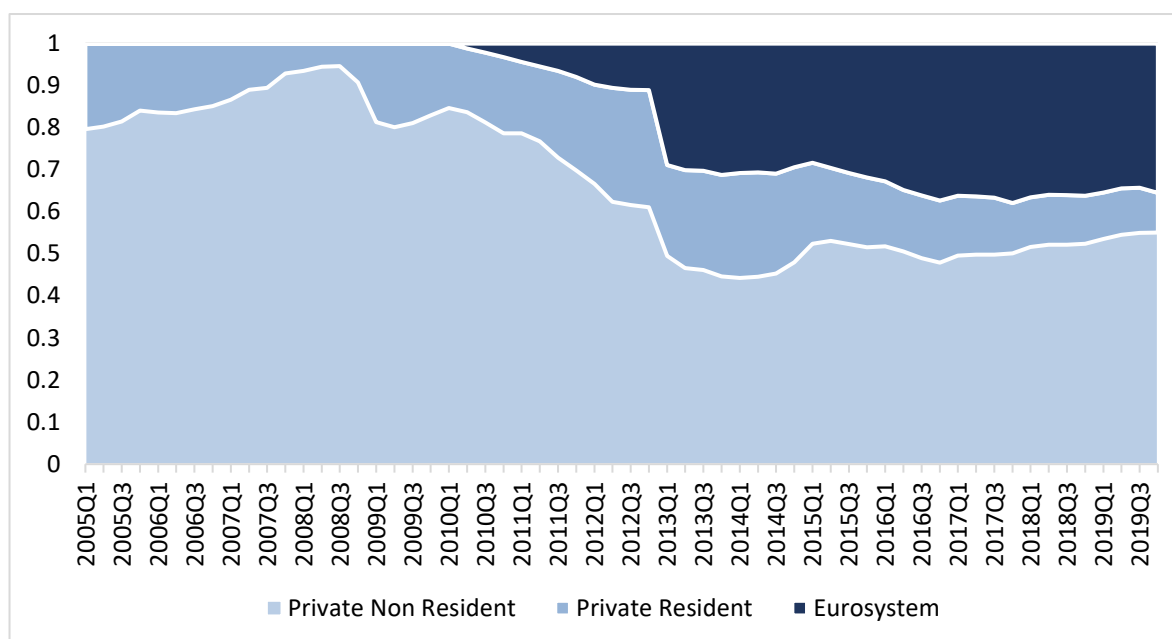
Source: Investing.com.

Note: Black dashed line marks the outbreak of the pandemic while the green dashed line marks announcement of PEPP.

⁶ In July 2020, McQuinn and Varthalitis (2020) also conducted a quantitative analysis based on year to date information and data available at that point in time. This article updates their quantitative analysis.

Prior to the PEPP, the ECB engaged in a number of other asset purchase programmes in the post-financial crisis era. These programmes were instigated in response to the sovereign debt crisis in the Euro Area following the financial crisis and the anaemic inflation rates throughout the Eurozone in the intervening years. Figure 2 shows the amount of long-term Irish government debt held by the Eurosystem/ECB between 2005 and 2019. The amount of debt held by private markets is also included for comparative purposes. Between 2009 and 2013 there was a sharp increase in Irish long-term government debt by held by the Eurosystem. This can be attributed to the bailout programme that was introduced over this period in which the Eurosystem purchased large sums of Irish government debt to make up for the shortfall in the public finances. Eurosystem holdings of Irish sovereign bonds continued to increase in the following years until it began to temporarily wind down its asset purchase programme in 2018. However, these were reintroduced in 2019 and coupled with the large scale purchases of sovereign debt as part of PEPP, there are likely to be further increases in ECB purchases of Irish government debt in 2020 and beyond.

FIGURE 2 IRISH LONG-TERM DEBT HELD BY THE PRIVATE MARKET/EUROSYSTEM



Source: National Treasury Management Agency.

In addition to the monetary policy intervention by the ECB, European Union leaders agreed to a multi-year spending package of €1.8 trillion in July 2020. As part of this package a €750 billion 'Next Generation EU' fund to target the ill effects of the pandemic was also agreed. Of the €750 billion, €390 billion will be distributed as grants with the rest distributed as loans. This fund will be distributed proportional to the level to which a country has been impacted by the pandemic. Crucially, the fund

will be joint financed by all members of the European Union. This will ensure that countries that have seen their debt levels spike as a result of COVID-19 and the administrative closures will not be burdened by further debt.

3. THE MODEL

Our model is similar to the medium scale small open economy DSGE model developed in Varthalitis (2019). We extend the model in the following ways: first, we allow for the negative demand and supply effect of the pandemic in the small open economy of a Member State of the EU. Second, we develop the fiscal block of the model so as to incorporate a set of extraordinary fiscal instruments that are used by national fiscal authorities to mitigate the negative effect of the pandemic. Third, we allow for a greater policy role of the ECB in providing financial assistance to an individual Member State in the form of sovereign bond purchases (for further technical details on these extensions see McQuinn and Varthalitis, 2020).

3.1 DSGE model

The model developed in Varthalitis (2019) follows a typical household utility maximisation subject to a sequential budget constraint. Here the model is adjusted to take into account the impact of the pandemic which has a negative impact on both demand and supply, e.g. consumption falls from containment policies while labour supply is restricted due to the administrative closures and/or the risk of workers becoming infected. In response to the pandemic, the Government launches a set of extraordinary spending instruments to alleviate the negative economic effects. In this model the spending instruments can take a number of different forms. The first spending type we look at is expenditure related to public health. We assume that this type of spending is a strong complement to private consumption. The economic logic of this assumption is that the extreme containment measures curtail a large part of consumption activities. Households will only be able to restore their levels of private consumption if the Government can guarantee a certain level of safety through public health measures. The second type of expenditure we look at is a labour income subsidy which is proportional to the loss of labour income experienced in the private sector. That is, the Government pays back a fraction of the income losses occurred during the pandemic. Finally, we look at direct extraordinary cash transfers. To account for targeted fiscal policies to different income classes, we allow income subsidies and cash transfers to differ between Ricardian (savers) and non-Ricardian (non-Savers) households.

3.2 Model policy extension

We extend Varthalitis (2019) by allowing national fiscal policy to use an extraordinary set of spending instruments in a discretionary manner while also allowing for an enhanced role for the ECB in purchasing Irish sovereign debt.

Institutional composition of public debt

Following Economides et al. (2020), we assume that Ireland's public debt can be purchased by two types of creditors that differ in their institutional state: (i) private markets, i.e. domestic and foreign agents that participate in the domestic and international financial markets and (ii) EU institutions (i.e. ECB). Total public debt in period t expressed in nominal terms is:

$$P_t F_t^M + S_t P_t^* F_t^{*E} \quad (1)$$

where $P_t F_t^M \equiv P_t B_t + S_t P_t^* F_t^{*g}$ denotes public debt in private markets and is further decomposed in public debt held by domestic private agents, $P_t B_t$, and foreign private agents, $S_t P_t^* F_t^{*g}$. In what follows, $P_t F_t^M$ will be referred to as market-held public debt. $S_t P_t^* F_t^{*E}$ denotes public debt that is purchased by the ECB and it will be referred as ECB-held public debt. Below, we assume that each type of public debt incurs different borrowing costs, which have different implications for the domestic country's public finances.

Borrowing cost and type of institutional creditor

We assume that the borrowing cost faced by the small open economy depends on the institutional state of the creditor. In terms of public debt in private markets, we assume that the interest rate at which Ireland borrows from the private markets is debt-elastic (as in e.g. Philippopoulos et al., 2017):

$$Q_t = Q_t^* + \varphi^d \left(e^{\frac{P_t F_t^M}{P_t Y_t^{gd}} - \mathcal{F}^M} - 1 \right) \quad (2)$$

where Q_t^* denotes the union-wide interest rate, φ^d is a parameter which measures the elasticity of the interest rate with respect to deviations of the market-held public debt-to-GDP ratio from its threshold value, \mathcal{F}^M .

In terms of public debt purchased by the ECB, we assume that the ECB can lend to a Member State at an interest rate lower than the one the Member State would face in the private markets, i.e. $Q_t^* < Q_t$. This is because the lower interest rate is based on

the economic fundamentals and policies of the currency union (e.g. the interest rate policy of the ECB). As noted in Reis (2016), in the absence of any sovereign risk premium, the two types of bonds are equivalent. However, the higher the sovereign risk due to the higher debt levels held by private markets (or for other reasons captured in φ^d) the larger the importance of the institutional type of the creditor.

National Fiscal Policy

We assume that the Government has two sets of spending instruments:

1. Conventional nominal government spending, which includes non-utility enhancing government consumption, investment, the public wage bill and total public transfers; and
2. A set of extraordinary spending instruments. These include labour income subsidies and direct cash transfers targeted to Ricardians and non-Ricardians respectively and public health related government spending.

In our experiments, we assume that market-held public debt, F_t^M is adjusted residually to satisfy the government budget constraint in each period t ; while the ECB determines the supply of ECB-purchased public debt, F_t^{*E} as well as the interest rate paid on this debt Q_t^* . Ireland is a member of a currency union; thus we solve for a monetary regime without monetary independence and a fixed exchange rate regime.

We assume that the national fiscal authorities use one or more fiscal instruments to only react to public debt held by private markets. This assumption implies that, in the short run, the ECB funded public debt does not impose an extra fiscal burden on the Member State's public finances.

This could be thought of as a situation where policymakers suspend the stringency of the fiscal targets amid the pandemic crisis. We have already seen this with the suspension of fiscal rules from the EU. As a result, there is less of an immediate need for domestic policymakers to adjust their fiscal stance in the near term in order to reduce their debt burden. Thus, it creates additional fiscal space for national fiscal policymakers to adjust their public finances in an attempt to mitigate the negative economic effects of COVID-19.

On the other hand, it should be noted that public debt held by the ECB enters the government budget constraint,⁷ thus, eventually, it will result in a fiscal cost.

That is, in the medium/long run, the ECB funded debt should be financed either by the issuance of new public debt in the private markets or by future fiscal adjustment (i.e. tax increases and/or spending decreases). The timing of this depends on the ECB policy which is specified in the next section.

Extraordinary fiscal instruments

To deal with the unprecedented nature of the shock, national fiscal policymakers use a set of extraordinary fiscal instruments. The fiscal authority sets these instruments in a discretionary manner for the specific time period in which the economy is affected by the pandemic.

ECB

In our model, however, we assume that the ECB can utilise two policy instruments to intervene in managing the debt levels of a Member State's economy, namely the union-wide interest rate, Q_t^* and sovereign bonds holdings, F_t^{*E} .⁸ In terms of sovereign bonds holdings, following Sims and Wu (2020), we assume that ECB institutions' purchases of sovereign bonds are set according to a Taylor-type reaction function:

$$F_t^{*E} - F^{*E} = \rho^{F^{*E}} (F_{t-1}^{*E} - F^{*E}) + \gamma^{F^{*E}} \left(\frac{DEF_t}{P_t Y_t^{GDP}} - def \right) + \epsilon_t^{F^{*E}} \quad (3)$$

where $\gamma^{F^{*E}}$ is the share of the public deficit to output deviation from a target, def , that the ECB finances via sovereign bond holdings, $\rho^{F^{*E}}$ capture the speed with which these bonds could be reduced and $\epsilon_t^{F^{*E}}$ is an iid shock that captures discretionary sovereign bonds purchases by the ECB. The policy parameter $\gamma^{F^{*E}}$ governs the share of the domestic deficit-to-output ratio that the ECB allow to be financed via ECB bond holdings in period t . The policy parameter $\rho^{F^{*E}}$ governs the duration of the ECB purchasing programme. For example, a short-lived purchasing programme, captured by a lower value of $\rho^{F^{*E}}$ means that the Member State that borrows from the ECB will need to generate additional resources in a quicker manner to meet its financing needs, either by borrowing purely via private markets or by tax/spending adjustments.

⁷ See Equation 4 in McQuinn and Varthalitis (2020) for details.

⁸ For thorough discussion and modelling of the alternative instruments available at the Eurosystem see Economides et al. (2020) and references therein.

4. SCENARIO ANALYSIS

We assume two different recovery outcomes for the Irish economy: a V-shaped recovery, where the economy is expected to recover quite quickly; and a long-lasting outcome, where the negative effects of the pandemic endure for a longer period. In the V-shaped outcome, we assume that the containment measures will succeed in containing the virus within a short period of time. In terms of the model, this means that the pandemic shocks will last one period. If this outcome were to materialise, the economy is expected to recover quite quickly.

In the long-lasting outcome, we assume that the supply and demand effects of the pandemic will endure for a relatively longer period. This could mean that containment measures, e.g. administrative closures, would be released gradually and that economic activity will be restored at a slower pace. In terms of the model this means that the shocks will die out in around three periods. The magnitude of the initial shocks is identical in both scenarios; we only vary the persistence parameters and hence the duration of the shocks as opposed to their scale.

4.1 Policy responses

The Government is assumed to utilise the set of extraordinary fiscal instruments in a discretionary manner to mitigate the negative impact of the pandemic. Initially, we examine the impact of one fiscal instrument at a time in order to quantify the effects on output of each fiscal instrument separately (normalised to 1 per cent of steady state output unless otherwise stated). Two alternative public financing scenarios of these extraordinary fiscal packages are now considered.

First, via private markets where the emerging public deficits are financed by an increase in market-held public debt at the market interest rate. Second, we allow the ECB to provide financial assistance to Member States in the form of purchases of government bonds.

5. RESULTS

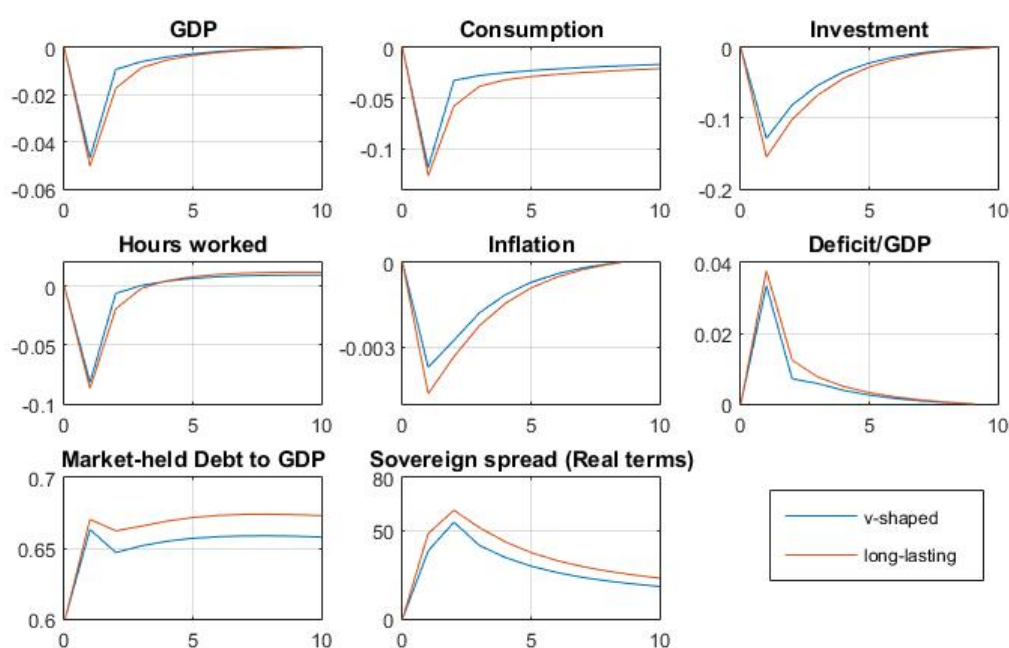
5.1 Pandemic impact on the Irish economy

Figure 3 presents the dynamic responses of the key endogenous macroeconomic variables under the two recovery outcomes based on the ‘V-shaped’ and the ‘long-lasting’ recovery. On the demand side, due to the administrative closures and the higher risk of becoming infected, households reduce consumption sharply in the short run. Similarly, the rest of the world reduces its demand for Irish goods and services resulting in a large reduction in domestic exports.

On the supply side, the pandemic shock causes a substantial fall in hours worked. Subsequently, the large decrease in hours worked and consumption will also reduce investment. As a result, the combined negative impact of demand and supply causes a significant reduction in output.

As expected, the combined effects of these shocks have significant implications for key fiscal metrics. The large drop in demand and supply leads to a drop in wages and returns on capital across sectors. As a result, the tax base of the economy which consists of consumption and income from labour and capital is expected to experience a significant fall. Accordingly, there is a sharp rise in the national deficit. In Figure 3, we assume that the deficit is financed by an increase in borrowing via private markets. Thus, the public debt held by private markets increases and this puts upward pressure on the sovereign premia. The rise in real interest rates feeds back into the economy and further suppresses investment and consumption.

FIGURE 3 DURATION OF THE PANDEMIC SHOCK AND IMPACT ON THE IRISH ECONOMY



Source: Authors' analysis.

Note: GDP, consumption, investment, hours worked and inflation are in % from their steady state values; Market-held public debt and deficit-to-GDP are ratios. The sovereign premia is the rate (%).

5.2 The role of policy

In Table 1 we quantify the implications of the extraordinary national fiscal policy measures on output levels in the first year by varying the fiscal policy instrument used to alleviate the negative effect as well as the method of public financing these extraordinary fiscal packages. In the first column we report which fiscal instrument

is used to deal with the economic fallout. The fiscal instruments which are utilised are additional spending in ‘public health’, cash transfers targeted at financially constrained households, labour income subsidies targeted at financially constrained households⁹ and the spending fiscal mix. The spending mix is a combination of the three aforementioned fiscal instruments. We include two types of spending mix, the first is labelled 3 per cent, where there is a 1 per cent increase in health-related expenditure, cash transfers and labour income subsidies. The second is a larger spending mix of 5.5 per cent where there is a 1.5 per cent increase in health-related expenditure, a 3 per cent increase in cash transfers and 1 per cent increase in labour income subsidies. This spending mix is based on the forecast growth of expenditure on these items in 2020 relative to 2019. It should be noted that there are additional spending instruments available to the Irish government such as subsidies to firms but for the purpose of this model we limit ourselves to these three instruments.

The results under the two scenarios of public financing; private markets and ECB-held debt, are presented in the third and fourth column. In the second column, the results for when there is no policy intervention at either national or supranational level are also presented.¹⁰

TABLE 1 FIRST YEAR OUTPUT RECESSION UNDER VARIOUS POLICY SCENARIOS (PERCENTAGE)

Policy instrument	No Policy	Market-held debt	ECB-held debt
Health related expenditure	-5.1	-4.4	-3.8
Cash transfers	-5.1	-5.0	-4.4
Labour income subsidies	-5.1	-5.0	-4.5
Spending mix (3%)	-5.1	-4.2	-3.5
Spending mix (5.5%)	-5.1	-3.5	-2.8

Source: Authors’ analysis.

In terms of mitigating the negative impact on output, the most effective instrument is spending associated with public health. This is followed by a targeted fiscal policy which supports the income of non-Savers either via labour income subsidies or direct cash transfers. The least effective fiscal instruments are labour income subsidies and cash transfers targeted at Savers.¹¹ However, the mitigation effect is quantitatively small in most of the cases when these extraordinary fiscal measures are financed solely via newly issued public debt in the private markets (see the explanation

⁹ For comparison, the size of fiscal stimulus for each fiscal instrument is normalised to 1 per cent of steady state output.

¹⁰ For comparability, across all three scenarios, the Government uses conventional government consumption to react to market-held public debt so as to ensure fiscal sustainability.

¹¹ We have also examined the case in which the Government increases cash transfers and labour income loss subsidies targeted to Savers. However, our results suggest that these extraordinary fiscal instruments are not efficient in terms of aggregate output. The economic logic is that Savers have other sources of income, such as access to domestic and international financial markets, thus it is expected that these fiscal measures will not affect their consumption plans in the short run. To save space we exclude these results from Table 1.

below). In contrast, when the ECB actively engages in sovereign bond purchases, the effect of the extraordinary national fiscal measures increases significantly across all fiscal instruments. In particular, increasing spending related to public health by 1 per cent of GDP could reduce the output loss by 0.6 per cent more when the ECB intervenes, i.e. from 4.4 per cent to 3.8 per cent. Similarly, increases in direct cash transfers and labour income subsidies targeted to non-Ricardians/non-Savers backed by ECB purchased bonds could reduce the output loss by 0.6 per cent and 0.5 per cent, respectively. In terms of the spending mix, ECB purchased sovereign bonds to mitigate the recession by 0.7 per cent compared to the spending mix being funded through private markets.

Finally, the ECB sovereign bonds purchasing programme could enable a quicker recovery of the economy. In particular, the cumulative reduction in output loss over a five-year horizon relative to debt financing in the private market sum to 1.5 per cent, 1.5 per cent, 1.4 per cent and 1.8 (or 2.2) per cent for the direct cash transfers, labour income subsidies, spending related to public health and the spending mix respectively (Table 2).

TABLE 2 CUMULATIVE OUTPUT LOSS OVER FIVE YEARS HORIZON¹² (PERCENTAGE)

Policy instrument	No Policy	Market-held debt	ECB-held debt
Health Related Expenditure	-8.4	-7.9	-6.5
Cash transfers	-8.4	-8.5	-7.0
Labour income subsidies	-8.4	-8.5	-7.0
Spending mix (3%)	-8.4	-8.2	-6.4
Spending mix (5.5%)	-8.4	-8.3	-6.1

Source: Authors' analysis.

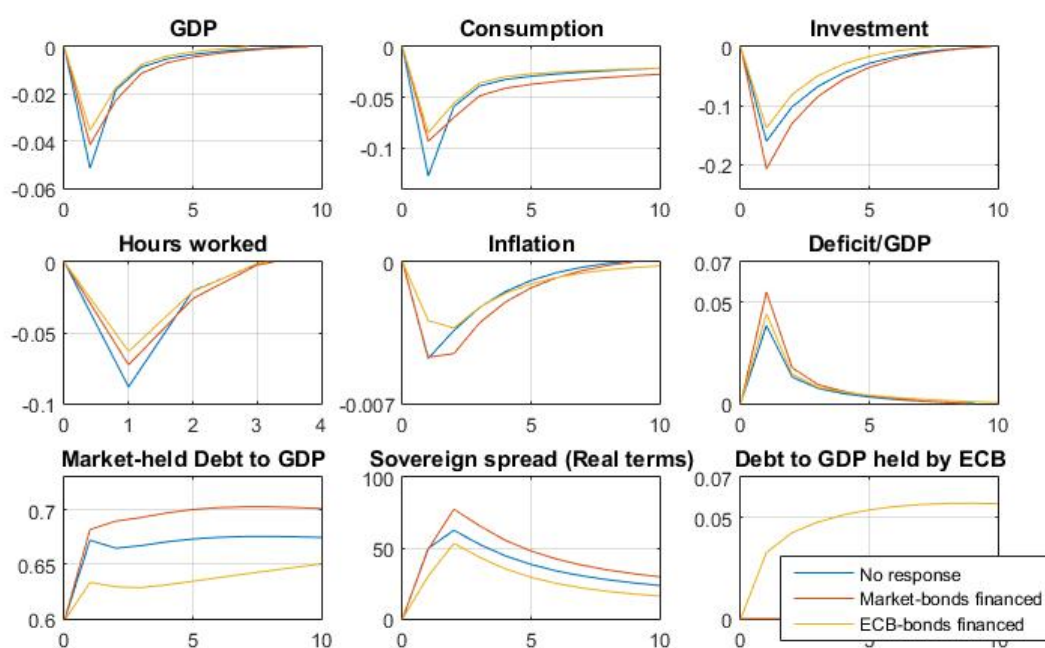
5.3 The underlying mechanism

Now we examine the mechanism by which the intervention of the ECB can help to mitigate the negative impact of the pandemic. We focus on the extraordinary spending mix presented in Table 1 and Table 2. Figure 4 compares the dynamic responses of the key macroeconomic variables under the two public financing scenarios. In particular, the scenarios in which the national deficits are financed via market-held public debt and where the national deficits are financed via the ECB. These are labelled as 'Market-bonds financed' and 'ECB-bonds financed' respectively. For comparability, we also present results from the scenario in which there is no policy response at the national and supra-national level; this is labelled as 'No response'. In terms of the key macroeconomic variables, an ECB bond

¹² Formulas of the cumulative output loss can be found in McQuinn and Varthalitis (2020), Appendix I.

purchasing programme can significantly mitigate the negative effect on consumption and investment in the short and medium term. This could suppress the initial reduction in output and ultimately allows for a quicker recovery in the medium term. As expected, on the fiscal side, financing the emerging deficits via the less costly ECB bond holdings allows extra fiscal space for the Member State in the short and medium term. Thus, the rise in the deficit and public debt is far less prolonged in this case.

FIGURE 4 NATIONAL FISCAL PACKAGE AND PUBLIC FINANCING SCENARIOS



Source: Authors' analysis.

Borrowing from the ECB leads to a smaller rise in market held public debt in the short run while it also keeps public debt in the medium/longer run at low levels despite the increase in national deficits. ECB-held public debt absorbs the temporary fiscal imbalances and thus stabilises domestic public finances in the medium/longer run. Lower public debt issued in private markets subsequently leads to lower real interest rates. Since the latter affects households' economic decisions, it makes national extraordinary fiscal measures more effective by crowding out less investment and consumption. In turn, the milder reduction in consumption and investment leads to a faster recovery in hours worked. Thus, labour and capital incomes of households experience a smaller decline which creates a further positive feedback loop on output. This results in a milder reduction in the associated tax bases, resulting in a lower rise in the national deficit across all time horizons. The combined effect of a lower rise in interest rates and a smaller decline in the tax revenues leads to a smaller rise in the national deficit. Overall, the ECB bond holdings can play a role of foreign

financial capital flows in the resource constraint of the small open economy (i.e. the balance of payments) which can help the Member State economy to mitigate the negative effects of the pandemic.

6. CONCLUSIONS

As with most Western economies, both the impact of the COVID-19 virus itself and the measures taken by the public authorities to counter the spread of the virus will have a dramatic and negative impact on the Irish economy. We model the impact of the virus with a standard SOE-DSGE model with both demand- and supply-side shocks. In simulating the impact of the shock, we assume two potential outcomes, (i) a V-shaped recovery where the containment measures succeed in containing the virus within a short period of time and (ii) a long-lasting recovery, where the supply and demand effects of the pandemic will endure over a longer period.

Our model based results indicate that an ECB bond purchasing programme significantly mitigates the negative effect of the virus-related shock on consumption and investment in the short and medium run. As a result, the impact on economic output is also reduced with a quicker recovery being facilitated in the medium run. Under our policy experiment, the ability of a Member State to finance part of the emerging deficit via less costly ECB bond holdings results in extra fiscal space for the domestic authorities in the short and medium run. This reduces the subsequent increase in the deficit and public debt than would otherwise be the case.

In light of the policy measures announced to date, it is fair to say that EU institutions generally have committed to playing a more expansive role in dealing with the present crisis than in previous cases. In order to maximise the efficiency of this support, it is important to be able to quantify the impact of this greater involvement on both Member States' key fiscal variables and growth outlooks. We believe our paper makes a significant contribution in that regard.

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