

## ESRI SPECIAL ARTICLE

### *Increasing future housing supply: What are the implications for the Irish economy?*

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[https://doi.org/10.26504/QEC2022WIN\\_SA\\_Egan](https://doi.org/10.26504/QEC2022WIN_SA_Egan)



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# INCREASING FUTURE HOUSING SUPPLY: WHAT ARE THE IMPLICATIONS FOR THE IRISH ECONOMY?

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Paul Egan, Eoin Kenny and Kieran McQuinn<sup>1</sup>

## ABSTRACT

Given the widely acknowledged imbalance between the supply and demand for housing in the Irish residential market, policy measures are particularly focussed on significantly increasing the supply of housing over the medium term. This paper seeks to identify the implications for the Irish economy of a sustained increase in housing activity. In particular we seek to identify potential capacity constraints across different aspects of the real and financial economy, which may result from greater levels of housing supply. The paper examines the likely increase in construction employment which would be required in order to meet Government targets for housing supply and assesses where the extra workers necessary to increase construction activity are likely to come from. The paper uses a recently developed model of the Irish construction sector within COSMO – the overall model of the Irish economy – to assess the overall macroeconomic implications of increased housing supply. This is particularly beneficial in assessing the performance of the construction sector in the broader economy. The paper also focusses on the financial sector and the issue of funding greater levels of housing supply. Namely, is the traditional financial sector capable of providing the required funding, or will other sources, including greater involvement by the State itself, be necessary? Finally, the paper teases out some further policy options which may help to address some of the potential constraints.

## 1. INTRODUCTION

One of the more adverse outcomes to emerge from the effect of the COVID-19 pandemic on the Irish economy has been the negative impact on the supply side of the housing market (see Allen-Coghlan et al., 2020 for more on this). Public health measures introduced by the Government to restrict the spread of the virus resulted at times in all construction sites being closed. This had a particularly adverse outcome on commencements in 2020. Furthermore, some of the international supply chain issues which have been precipitated by the pandemic have seen the costs for key inputs in the housing sector increase substantially.

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Prior to the pandemic, there was an acknowledged imbalance between the supply and demand for housing in the Irish economy. Estimates by Bergin and Garcia-Rodriguez (2020) indicate that the structural demand for housing in the Irish economy is approximately 35,000 units per annum, however the actual supply of housing units in 2021 was just over 20,000 units. Housing supply levels have been gradually increasing from a low of just over 4,500 units per annum in 2013 to just over 21,000 units in 2019; however the emergence of the pandemic has seen activity levels remain close to 20,000 in 2021. Furthermore, the actual level of supply has been below the structural demand for a number of years, resulting in a significant accumulation of unrealised demand.

The publication of *'Housing for all, a new housing plan for Ireland'*<sup>2</sup> by the Irish Department of Housing and Local Government in September 2021 represents another initiative by the Government to increase housing supply levels. The increase in funding provided in the plan coupled with the multi-annual nature of the funding, along with the likely passing of the economic effects of the pandemic in early 2022, means that housing supply is likely to increase over the medium term.

However, a number of issues specific to the construction sector but also of relevance to the general economy are likely to emerge as housing construction levels increase. The increase in housing market activity must be seen in the context of the broader performance of the Irish economy; prior to the pandemic the domestic unemployment rate in Quarter 4 of 2019 had fallen to 4.8 per cent. As public health measures were relaxed in the context of the pandemic, the unemployment rate has still managed to decline sharply to just 5.5 per cent in March 2022, having peaked at 26 per cent in 2021. Therefore, with the rate likely to fall further in 2022, the demand for labour in the Irish economy, outside of additional activity in the construction sector, is set to increase significantly. In such a tight labour market, a key question emerges: will the construction sector be able to source the additional labour required? Also, as countries have emerged from the pandemic since mid-2021, inflation rates have been increasing sharply. The degree and persistence of this increased inflation has been further exacerbated by Russia's invasion of Ukraine. These international factors, and their domestic spill-over effects raise further questions. For example, will greater levels of housing construction in the domestic context additionally fuel inflationary pressures, which were already emerging in the Irish economy, or will a smaller gap between the demand and supply of housing lead to lower inflationary pressures through

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<sup>2</sup> Full details are at: <https://www.gov.ie/en/publication/ef5ec-housing-for-all-a-new-housing-plan-for-ireland/>.

reduced housing costs? Related to the increase in inflation are the implications of monetary policy tightening by authorities across the Western world; central banks in the United States, the euro area and the United Kingdom have all been increasing policy rates. This brings a number of challenges for the construction sector.

Another potential constraint on future housing market activity is the capacity of the Irish financial sector to fund the necessary credit required for both construction activity on the one hand and mortgage provision on the other. Previous work by Duffy et al. (2016) highlighted the restrictions which may occur, particularly in the presence of new regulatory requirements brought in to address the credit market excesses of the pre-financial crisis era. Given that lending by traditional domestic financial institutions is now closely aligned with domestic deposits, can the financial sector raise the funding to match the increase in lending levels which will be required? Previously, the surge in credit provision witnessed in the period preceding the global financial crisis was increasingly funded by deposits from financial institutions abroad. However, regulatory changes brought in after the financial crisis restrict the ability of domestic financial institutions to avail of such funding.

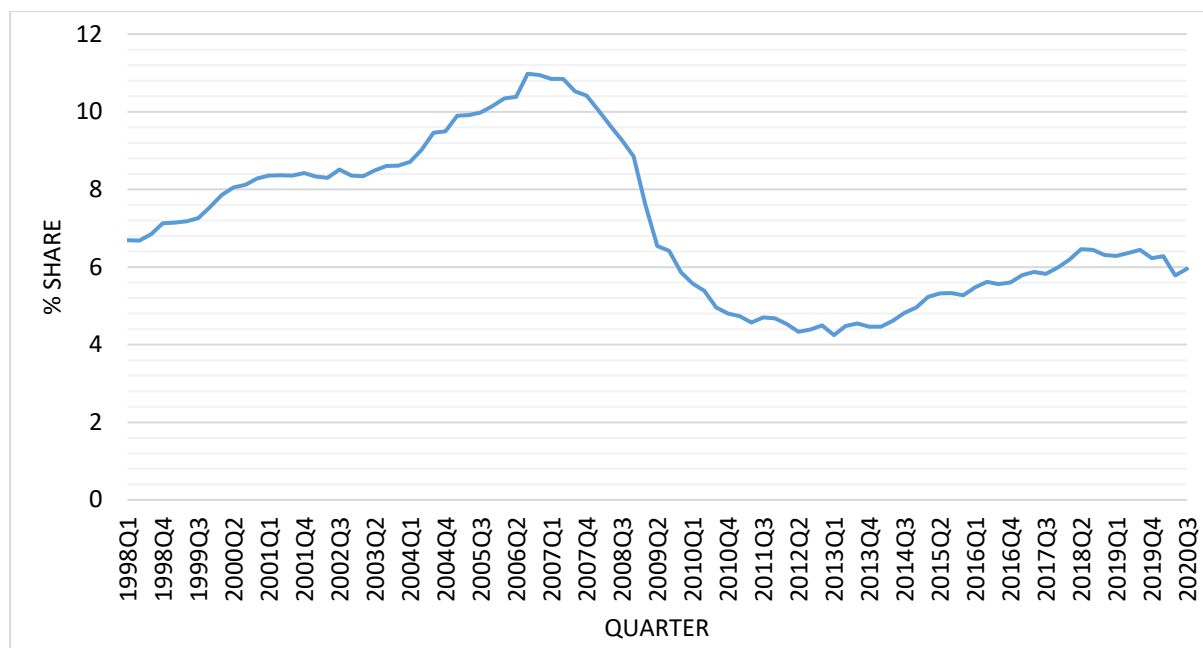
This is against the backdrop of significant changes to the financial landscape of the Irish residential market over the last decade, with the emergence of the State-supported Approved Housing Body (AHB) sector and, more substantially, the large influx of non-bank finance with global capital and private equity for large city developments becoming commonplace.

In this paper, we seek to examine the likely constraints which may impact the domestic construction sector scaling up its levels of activity. Initially, the historical relationships between housing supply, employment and migration trends are assessed. We then avail of a new addition to COSMO (Bergin et al., 2017), the existing macroeconomic model of the Irish economy, to quantify the general equilibrium impacts of the increased housing supply. Egan and Bergin (2022) present a modification of COSMO which incorporates a specific construction sector. This model is used to trace the macroeconomic impacts of increased housing supply on unemployment, disposable income, house prices and wage levels in the construction sector. We also examine the relationship between housing supply and credit extension and assess whether alternative sources of finance may be required as an alternative to traditional sources of credit. Finally, in the policy conclusions section, we discuss a variety of policy proposals which may help to alleviate some of the potential constraints.

## 2. LABOUR MARKET AND MIGRATION

The Irish labour market has experienced profound change over the past 25 years. Figure 1 shows the development of the share of construction employment in total employment over the period of 1998 to 2020.

**FIGURE 1 SHARE OF TOTAL EMPLOYMENT IN CONSTRUCTION**

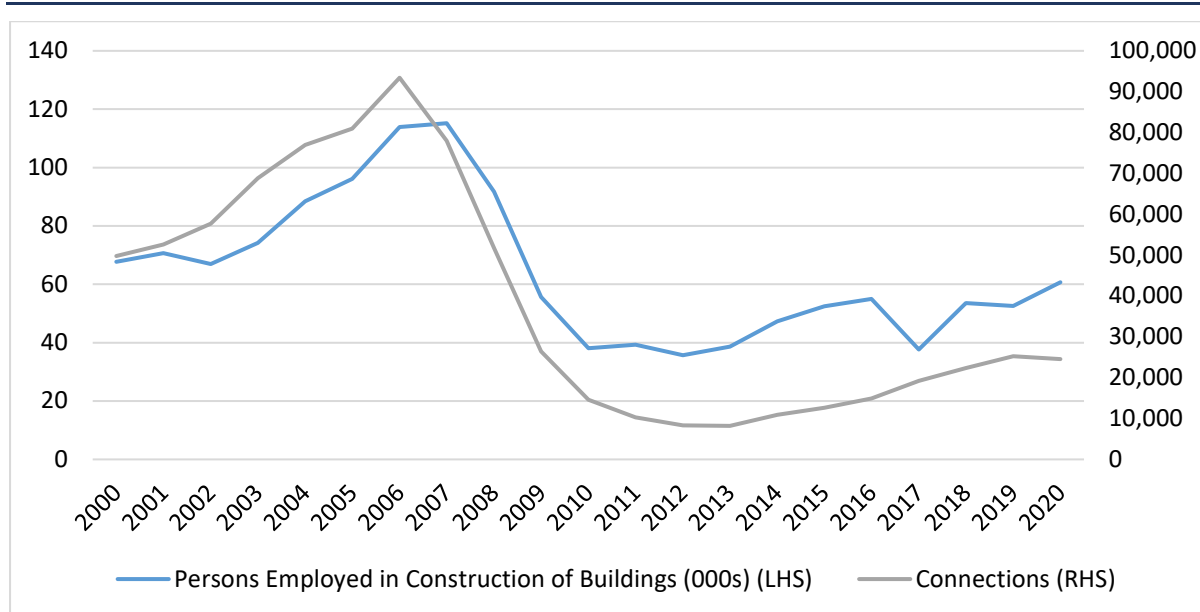


Source: Central Statistics Office and authors' calculations.

The share of total employment in construction increases from the mid-1990s until 2007 and declines sharply until 2013, when it began to stabilise and increase gradually thereafter. However, even with this recent increase, the share of construction employment in recent years has only reached rates observed in the late 1990s.

In Figure 2, the level of employment in the construction of buildings (both residential and non-residential) in Ireland is compared with the level of housing supply.

**FIGURE 2 HOUSING SUPPLY AND EMPLOYMENT IN CONSTRUCTION OF BUILDINGS**



Source: Central Statistics Office.

A clear relationship between housing supply<sup>3</sup> and employment in the construction of buildings is evident over the period.<sup>4</sup> While there has been an increase in employment in buildings-construction from 2013 onwards, there are two points of note. First, the numbers employed in construction are still much lower than their peak in the mid-2000s. Additionally, although employment in the construction of buildings has begun to grow steadily, housing supply has not followed suit and has indeed increased at a much slower pace.

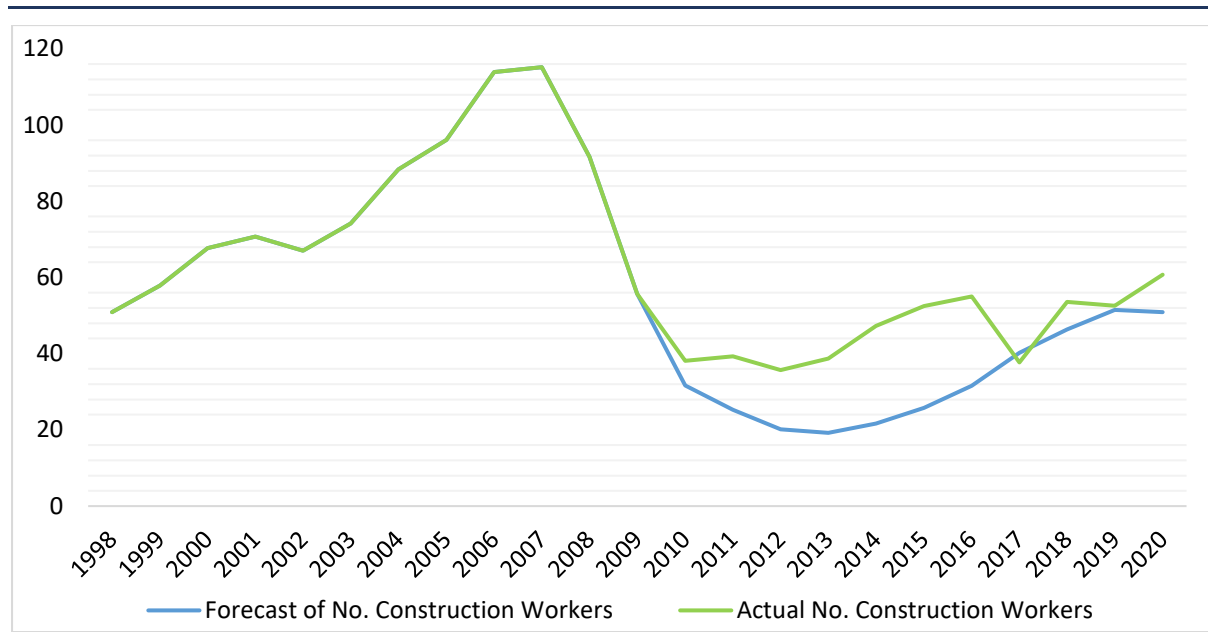
While these data represent a period of boom and bust in the construction sector, the research does suggest that if housing construction is to increase significantly in the future, the levels of those employed in the construction sector may have to increase substantially. It seems that in recent years, more workers have been employed for a given housing output. Clearly, it is the case that, while traditionally those employed in the construction sector were mainly concerned with house building, in recent years a significant number of workers have been employed in other areas of construction.

<sup>3</sup> ESB connections have been used by the Department of Housing, Local Government and Heritage as a proxy for housing completions for many years. However, what has become clear most notably emerging from the 2008 financial crisis is that these data do not exclusively refer to housing completions but also new connections and reconnections to the electricity network. These data should not be interpreted as the number of new housing completions but rather as the number of ESB Connections. Nevertheless, the relationships in this paper are evident when using the CSO Construction and Buildings Production Index also.

<sup>4</sup> 'Persons employed in the construction of buildings' refers to those employed in the development and construction of residential and non-residential buildings.

In order to tease this relationship out further, the following empirical exercise seeks to estimate what the numbers of people employed in the construction sector would have been if the historical relationship between housing units and construction workers had held in the present. The relationship between buildings-construction employment and housing output was estimated for the period of 1998-2009. The estimate was then used to produce a counterfactual projection of construction employment over the period of 2010-2021.<sup>5</sup> This is then compared to the actual employment level over the period.

**FIGURE 3    ACTUAL AND COUNTERFACTUAL NUMBER OF CONSTRUCTION WORKERS**



Source: Central Statistics Office and authors' calculations.

The counter-factual forecast produced suggests that the decline in the number of buildings-construction workers would have been greater post-2009 if the historical relationship had held over that period. It suggests that, while there was a significant drop in buildings-construction workers employed after the financial crash, it was not as severe as it could have been based on the historical relationship between buildings-construction employment and housing output. Therefore, it is possible that some of these workers shifted from the residential side of the construction of buildings to the non-residential or commercial side of the sector. This would explain the less severe decline in buildings-construction workers compared to housing production.

<sup>5</sup> Details of the model are available, upon request, from the authors.

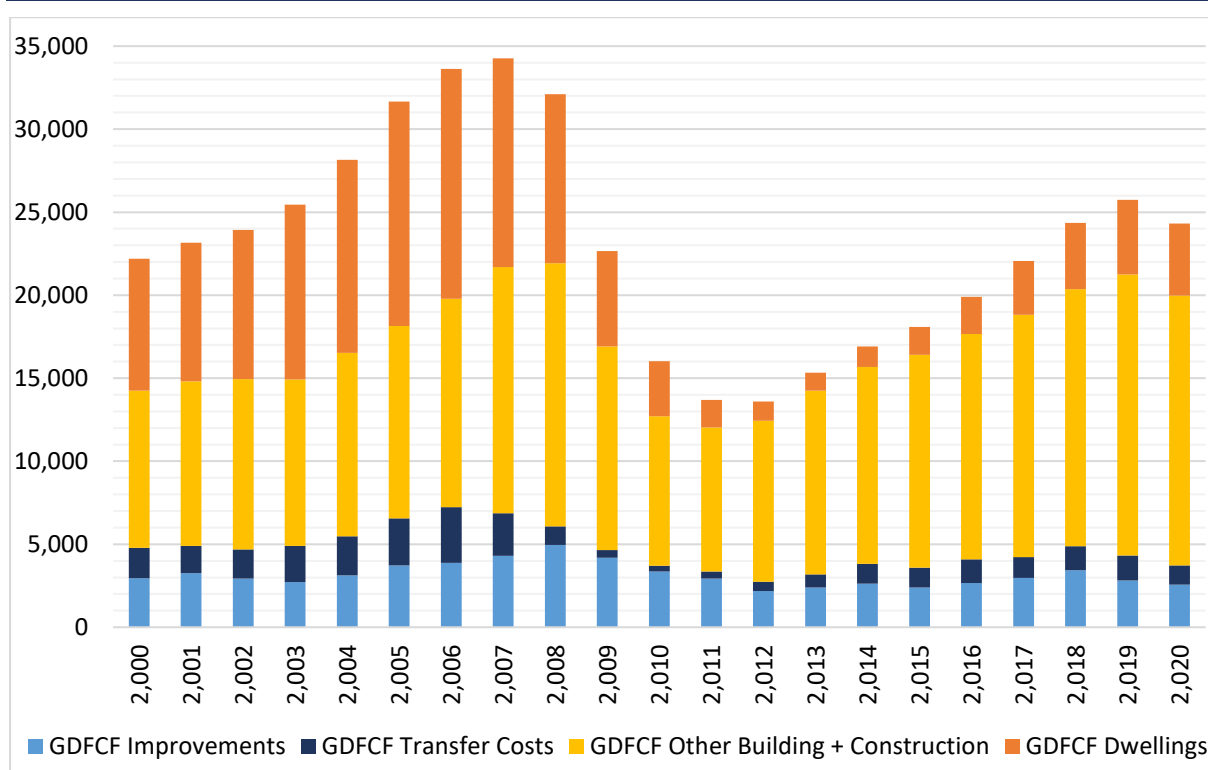


It is possible that certain tasks such as home improvements reduced the impact on construction employment. Additionally, large increases in emigration after the financial crash are well documented, and it is possible that high productivity workers left the country in pursuit of better economic opportunities elsewhere. This may have led to a decrease in the productivity of construction firms. Finally, the housing market has developed since the financial crash, with apartment blocks constituting a larger share of construction in recent years. This may explain the change in the relationship between housing supply and the number of workers, as apartment blocks use more prefabricated components and hence are less labour intensive.

While no data can be found giving a breakdown of the number of workers in residential buildings construction versus commercial buildings construction, it is possible to achieve a breakdown in these types of construction activity with other data.

## **2.1 Gross Domestic Fixed Capital Formation (GDFCF)**

One way in which the relative activity in the residential versus the non-residential construction sector can be assessed is through the difference in the investment and output of buildings in the residential sector compared to the commercial sector. Gross domestic fixed capital formation (GDFCF) across the different sections of the construction sector can be observed. GDFCF is used as a measure of both investment (OECD, 2021) and construction output (Gruneberg and Folwell, 2013). Therefore, differences in GDFCF should point to important differences in activity between the residential and non-residential buildings sections. Figure 4 shows how GDFCF in the construction sector overall is broken down.

**FIGURE 4 GROSS DOMESTIC FIXED CAPITAL FORMATION – SECTORS WITHIN CONSTRUCTION**

Source: Central Statistics Office.

From the graph, it is apparent that while much of the contraction in the construction sector after the financial crash was in the residential or ‘dwellings’ section of construction, the ‘other buildings’ section of construction has recovered strongly since 2011. The residential sector has seen very little growth in GDFCF since the financial crash. This highlights the re-allocation of resources within the private construction sector, with the distribution of resources increasingly moving towards ‘other buildings and construction’, such as commercial building.

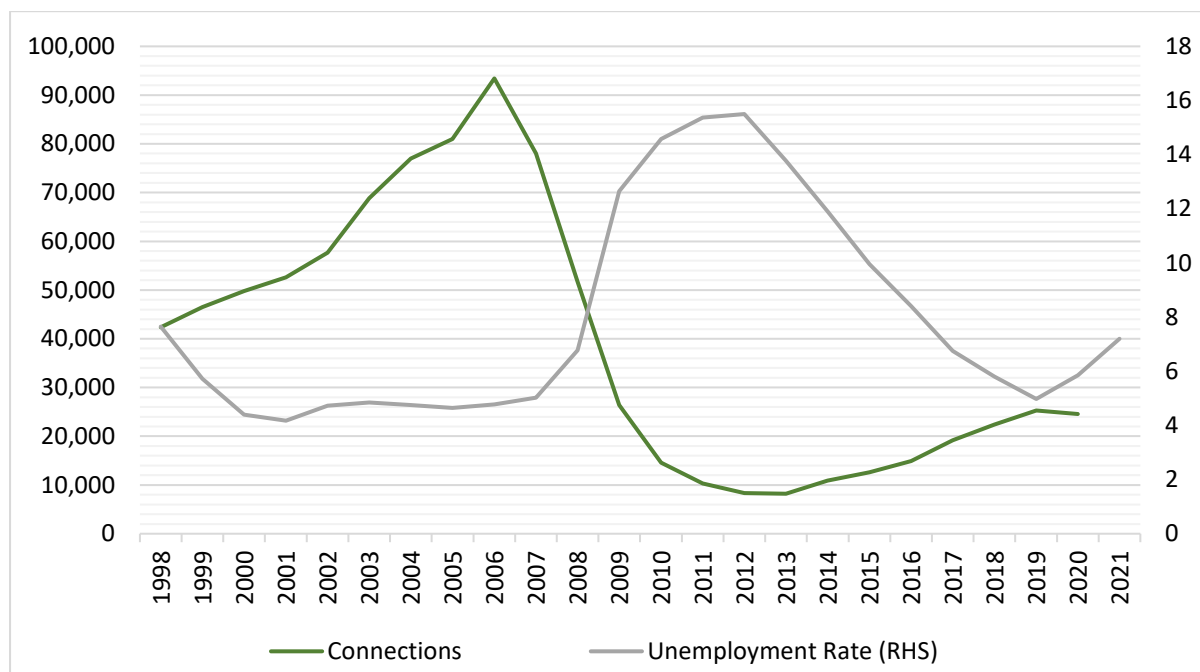
This suggests that a reallocation of resources from the commercial section of the construction sector to the residential section could help alleviate some of the potential labour constraints. It indicates that the total increase in employment required in residential construction to increase the scale of housing production may not be as great as an analysis of the total construction employment would suggest. This is discussed further in Section 5.

## 2.2 Migration

Another important potential source of employment in the construction sector has been the migration channel. Recent events such as the possible reduction in international mobility due to COVID-19 as well as a high cost of living in Ireland and scarcity of housing may well mitigate against this important channel (Ahern-Flynn

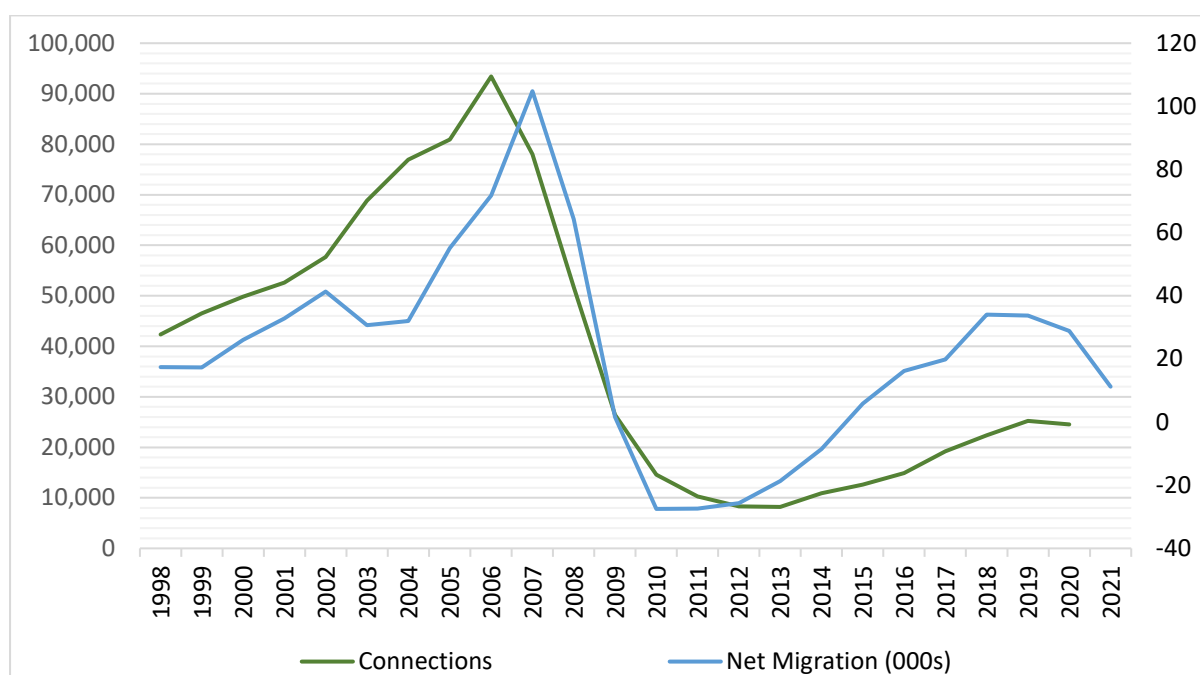
et al., 2021). The following two graphs illustrate the relationship between both inward migration and unemployment overall with housing supply over the period 1998-2021.

**FIGURE 5 HOUSING SUPPLY AND UNEMPLOYMENT**



Source: Central Statistics Office.

**FIGURE 6 NET MIGRATION AND HOUSING SUPPLY**

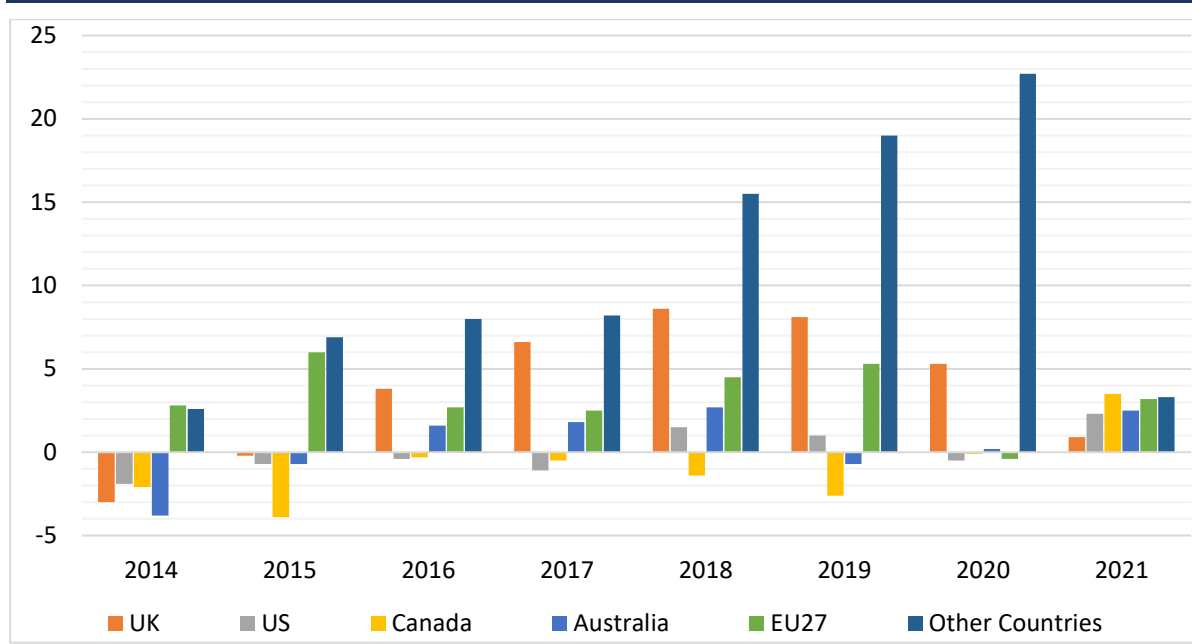


Source: Central Statistics Office.

From Figure 5, one can see that low rates of unemployment are strongly correlated with higher levels of housing output. However, similar to the trend in Figure 2, a strong decline in unemployment since 2013 has not been accompanied by an increase of the same proportion in housing supply. This is notable as the graph shows that in the past, movements in unemployment and housing supply have been quite proportionate. Of course, the data for 2020 and 2021 show unemployment and housing supply diverging once again due, mainly, to public health restrictions introduced as part of the national response to COVID-19.

This relationship is likely being driven by a combination of demand and supply factors. It is clear that if housing output is to increase, it will require an increase in employment, and hence this increased labour supply as a result of increased output is certainly a driver of this relationship. It is also true that as more people become employed, more people will be able to save to buy their own home or to upscale to higher quality housing.

As with Figure 5, Figure 6 also illustrates a clear relationship between net migration and housing supply. It suggests that inward migration has been a major contributor to the labour force in the construction sector in the past. In recent years, however, levels of net migration have been increasing without the same increases in housing output. This would indicate that many immigrants are now working in sectors outside of the construction sector, and that a higher proportion are doing so than in the past. Figures 7 and 8 examine this issue more closely by examining both the country of origin of immigrants and the sectors that immigrants from some of the more frequent countries of origin work in.

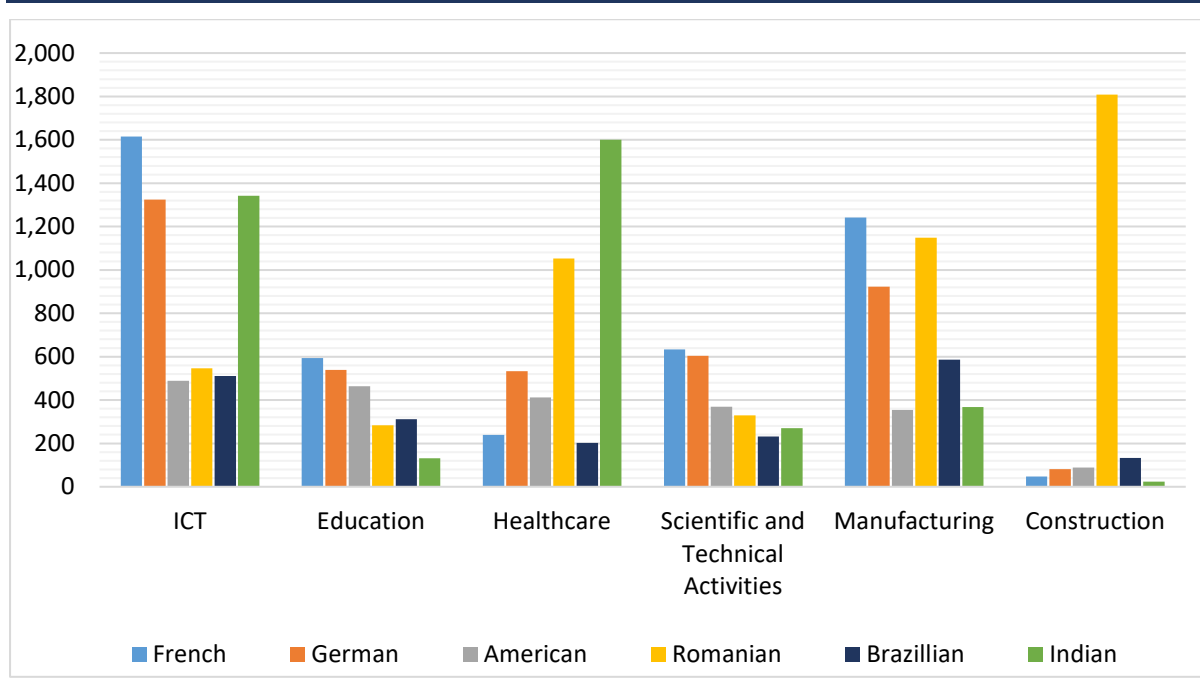
**FIGURE 7 ESTIMATED MIGRATION INTO IRELAND BY COUNTRY OF ORIGIN (000S)**

Source: Eurostat.

The EU27 and ‘other countries’ have been the main source of inward migration for Ireland in recent years. In the past, EU countries were the largest drivers of immigration to Ireland, particular after the accession of Eastern European countries into the EU, such as Poland and Lithuania. Over the last five years, however, those from ‘other countries’ were the largest group of immigrants in Ireland over the past six years with sizeable increases in immigration from this group in particular from 2018 onwards. It is likely that this is also an effect of Brexit, as Britain has tightened its immigration policies since leaving the EU, with non-UK citizens now requiring a visa to work or study there. It is also interesting to see that inward migration from the UK increased to much higher levels after the Brexit referendum in 2016.

In terms of future inward migration, Figure 7 shows that, in both 2020 and 2021, there were substantial declines in migration. It is difficult, however, to assess whether this downturn can be attributable to the global impacts of COVID-19 or whether it is more to do with Irish-specific issues.

It is also important to assess the nature of immigrants coming to live and work in Ireland and whether they are, for example, inclined to work in the construction sector. In order to look at this issue, Figure 8 examines the sectors that non-Irish nationals in Ireland were working in as of 2016. It shows the results for six of the 12 highest non-Irish migrants’ countries of origin.

**FIGURE 8 NON-IRISH NATIONALS WORKING IN IRELAND (2016)**

Source: Central Statistics Office.

As can be seen, the influx of construction workers is minor compared to other sectors such as ICT and manufacturing. This would suggest that policymakers need to appraise whether construction skills should, for example, be added to the critical skills occupation list. This would make it easier for migrants from outside of the European Union to gain a visa on the basis that they have ‘critical’ skills – in this case, construction skills – through the attainment of a Critical Skills Employment Permit (CSEP).<sup>6</sup> As can be seen in Figure 8, this policy has been successful in attracting ICT, health and engineering professionals.

The relatively high cost of housing itself can prove a challenge in attracting migrants and maintaining the overall competitiveness of the domestic economy as noted by the National Competitiveness Council (National Competitiveness Council, 2021). It is also true that increased immigration will lead to higher levels of demand for housing and hence will put further upward pressure on house prices in the short term. Finally, it is also clear that housing conditions for immigrants in Irish society are already sub-optimal; McGinnity et al. (2022) found that immigrants tend to be concentrated in the private rental sector and have a higher risk of overcrowding and homelessness than Irish-born citizens.

<sup>6</sup> The critical skills employment permit is fully explained here: Critical Skills Employment Permits - DETE ([enterprise.gov.ie](https://enterprise.gov.ie)).

An additional important consideration in the context of future potential labour shortages is the issue of climate change and, in particular, the targets set out in the Government's Climate Change Action Plan. These will have significant implications in terms of future housing targets being met. For example, a sizeable increase in the demand for labour and materials in retrofitting public buildings and residential dwellings could result in an increase in tender costs and crowding out of house building.

Additionally, the sectoral emissions ceilings introduced under the Action Plan could necessitate a substantial fall in the construction sector's carbon intensity of production. This could be particularly binding in the case of cement, which is a central component of housing construction. The Action Plan calls for a reduction in emissions in residential and commercial buildings by 20 per cent by 2025 and by 45 per cent by 2030.

### **3. INFLATION AND MACROECONOMIC EFFECTS**

The recent rise in inflation has significant implications for the domestic construction sector. The presence of increased costs on the supply side of the residential property market could exacerbate the imbalance already observed between housing supply and demand. Initially high rates of inflation were being driven by a certain number of factors: fluctuations in raw materials prices; supply bottlenecks; tight labour markets; and finally, base effects from the drop in prices in 2020 (Beckmann et al., 2021; European Commission, 2022; Rees and Rungcharoenkitkul, 2021). Therefore, it had been thought by many that inflation would return below the ECB's target of 2 per cent by the end of 2022. However, the invasion of Ukraine and the subsequent economic sanctions placed on Russia have led to the persistence of inflation due to further shocks to the energy market and new shocks to the food sector, as Russia and Ukraine provide large amounts of the global grain supply. As a result, it is now expected that higher-than-target inflation levels will persist into 2023 (European Commission, 2022; McQuinn et al., 2022).

The spike in inflation will have a short-term impact on the housing market, and there could be longer-term effects due to tightening labour markets, reduced migration, and increased prices of materials and wages. Hence, it is necessary to examine these issues more closely in terms of their potential constraint on supply-side activity.<sup>7</sup>

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<sup>7</sup> It should be noted that there is some variation in an international context as to the source of the present inflationary pressures; some US commentators tend to attribute the inflationary pressures to pandemic-era stimulus measures, whereas some European commentators focus on the role played by the conflict in the Ukraine.

### 3.1 Supply chains

Many of the current inflationary pressures are a consequence of supply-chain bottlenecks lingering from the pandemic and shocks to the energy and food market from the war in Ukraine. Therefore, it is important to assess how these inflationary factors are likely to evolve over the short to medium term. Supply bottlenecks began arising in Spring 2020 and were mainly brought on by the pandemic. There are many factors that have contributed to supply chain issues. During COVID-19, consumption shifted away from services due to restrictions, which caused a rise in the consumption of durable and manufactured goods. This meant a rise in the demand for raw materials and intermediates such as wood, metal and chemicals. As mentioned previously, these are significant inputs in the construction sector. Lockdowns across the world also disrupted shipping and transport, while sporadic outbreaks of the virus led to further dislocations. This remains an issue, with strict lockdowns recently in effect in China, for example.

The economic downturn caused by the pandemic meant many firms began preparing for a reduction in production. When the recovery came, bullwhip effects meant that many supply chain participants were unprepared for the pick-up in demand (Beckmann et al., 2021; Rees and Rungcharoenkitkul, 2021). The large swings in construction activity over the last two years due to public health restrictions would have made it quite difficult for firms to acquire any level of stock with great certainty. Another factor which has impacted the recovery of supply-chains is the pace of the recovery, which has been much quicker than expected, leading to supply chains being overwhelmed by large increases in demand.

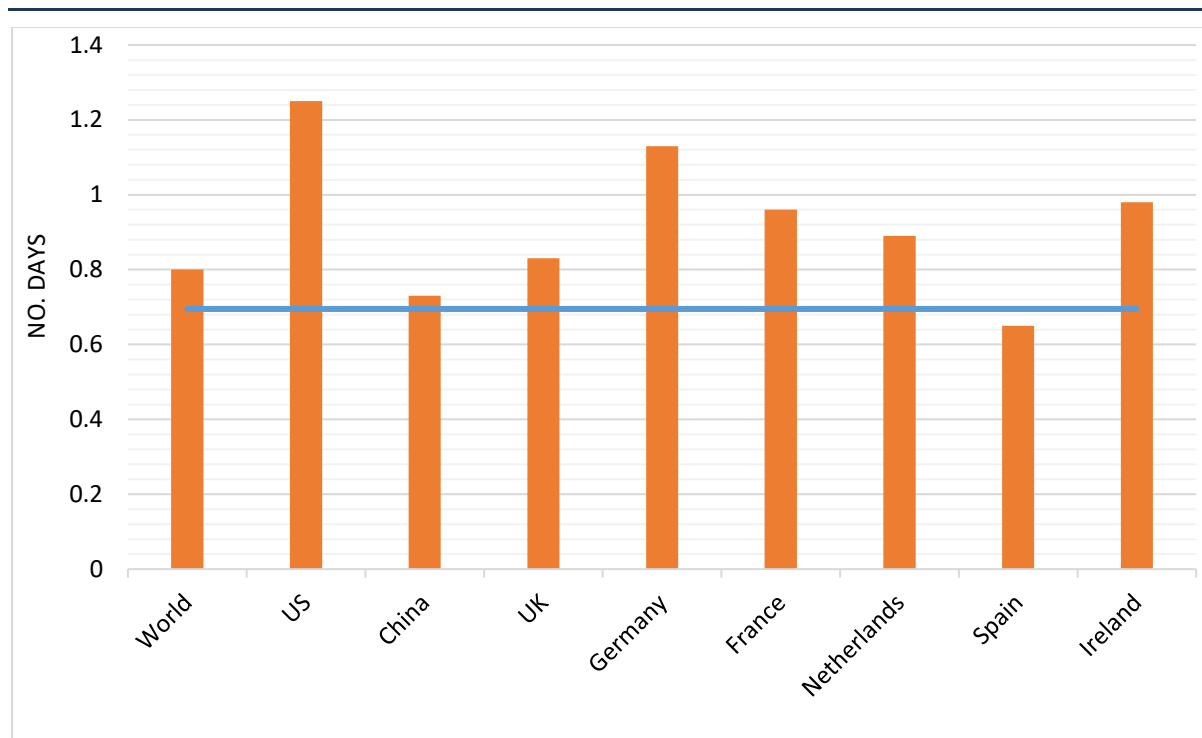
While these are significant issues, they are mainly short-term issues, from an international perspective. The pace of the economic recovery will likely slow down which will allow supply chains to catch up with demand. Also, as the economy continues to recover, consumption will likely be reallocated from goods to services. This should lead to lower demand for raw materials and intermediate goods which should lead to less upward pressure on prices (Beckmann et al., 2021; Rees and Rungcharoenkitkul, 2021). However, as mentioned, the Irish housing market is experiencing large levels of excess demand at this time. Therefore, domestically, the prices of materials will likely continue to rise, albeit at a slower pace.

There are, however, other issues which could present longer-term problems. One such issue is the actual structure of supply chains – their complexity makes them hard to repair when a shock arises and they have been built to be efficient, not resilient. The issues regarding supply chains have persisted for longer than was initially thought. One major issue is the shortage of containers for container ships to transport goods (De Santis, 2022). For example, between 2019 and 2021, the



times container ships spent in ports increased by 11 per cent and 42 per cent in the Netherlands and Germany respectively (UNCTAD, 2022). A country breakdown of the median time spent in ports is shown below.

**FIGURE 9 MEDIAN TIME IN PORTS FOR CONTAINER SHIPS IN 2021 AGAINST THE 2018-2019 GLOBAL AVERAGE**



Source: UNCTAD, De Santis (2022) and authors' calculations.

There is also concern about the global demand for a digital and green transition of the world economy. This demand emerged due to the increasingly clear effects of climate change and has now been compounded as countries seek to become more independent in terms of energy production, given the effects that the war in Ukraine and subsequent energy embargos on Russia have had on the international energy market. These shifts in demand will see the importance of certain goods change significantly. For example, demand for renewable energies and IT and electronics goods have increased over the last few years, and these shifts in demand have caused issues with supply chains (Rees and Rungcharoenkitkul, 2021). Ireland is also seeking to make these transitions and hence will not be immune to supply chain disruptions that may occur as a result.<sup>8</sup>

<sup>8</sup> As an aside, one way the government has proposed to aid in the green transition is to retrofit large amounts of existing houses to reduce their carbon footprint. However, this project would compete for similar resources as those needed to increase the housing supply, particularly labour.

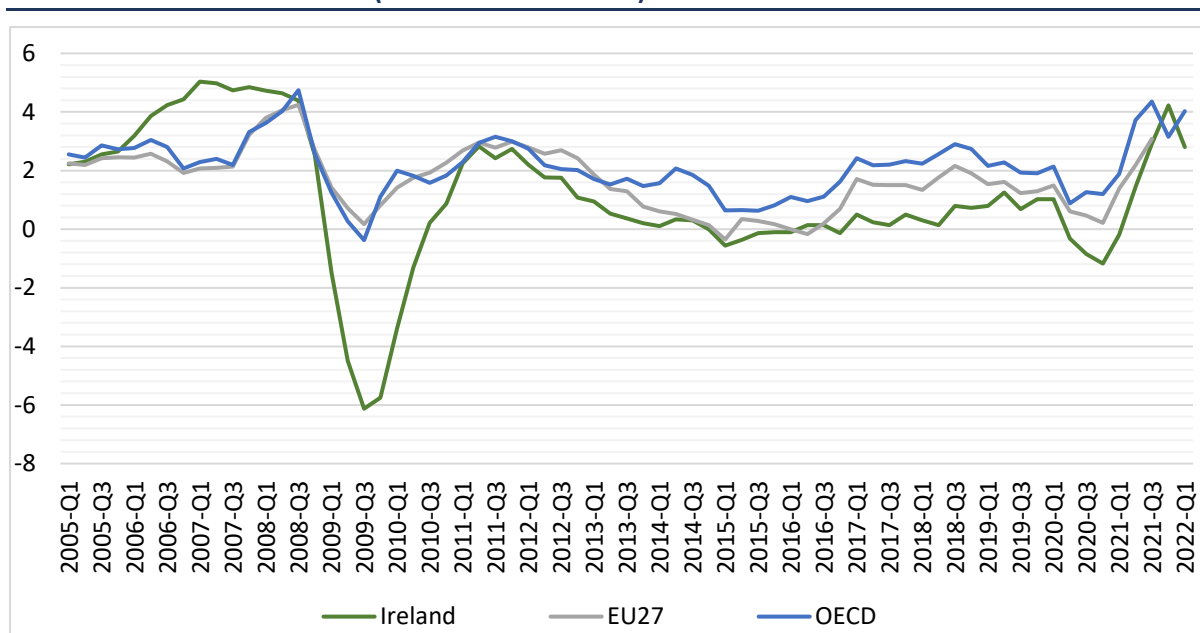
Overall, it seems as though the supply chain bottlenecks will subside in the short term, especially as the pace of the global economic recovery slows.

### 3.2 Inflation and input costs

It is unclear when supply chain structures will fully recover but the damage that supply chain disruptions have caused is quite evident. Inflation of building materials and increased wages to manage an increased cost of living have led to concerns surrounding the viability of projects from many construction firms.

To provide some context for the recent increase in inflation, Figure 9 presents the core inflation rate, which excludes energy and food prices, for Ireland, the EU and the OECD.

**FIGURE 9 CORE INFLATION (% ANNUAL GROWTH)**



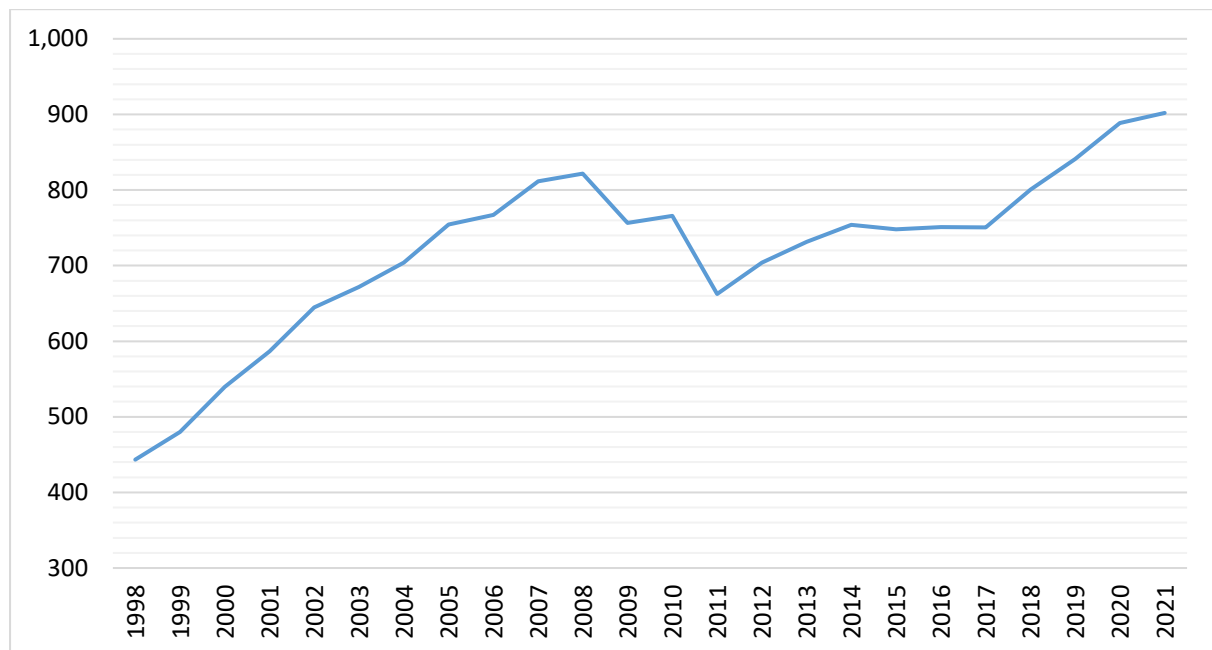
Source: OECD.

Core inflation was relatively constant over the last decade, hovering just above/below 2 per cent. The onset of COVID-19 and the ensuing restrictions saw an economic contraction and hence a drop in prices. In 2021, a clear increase in prices can be observed and this recovery has now surpassed pre-pandemic levels. Therefore, what effects will this surge in inflation have on construction and how long will those effects last?

It is informative, in that regard, to examine recent developments in construction sector wages. It is recognised that labour markets are tightening and this is true of the Irish construction sector also (Ahern-Flynn et al., 2021). One would expect,

therefore, that this would lead to an increase in wages. Figure 10 plots the average weekly earnings in the construction sector.

**FIGURE 10 AVERAGE WEEKLY EARNINGS (€) – CONSTRUCTION SECTOR**

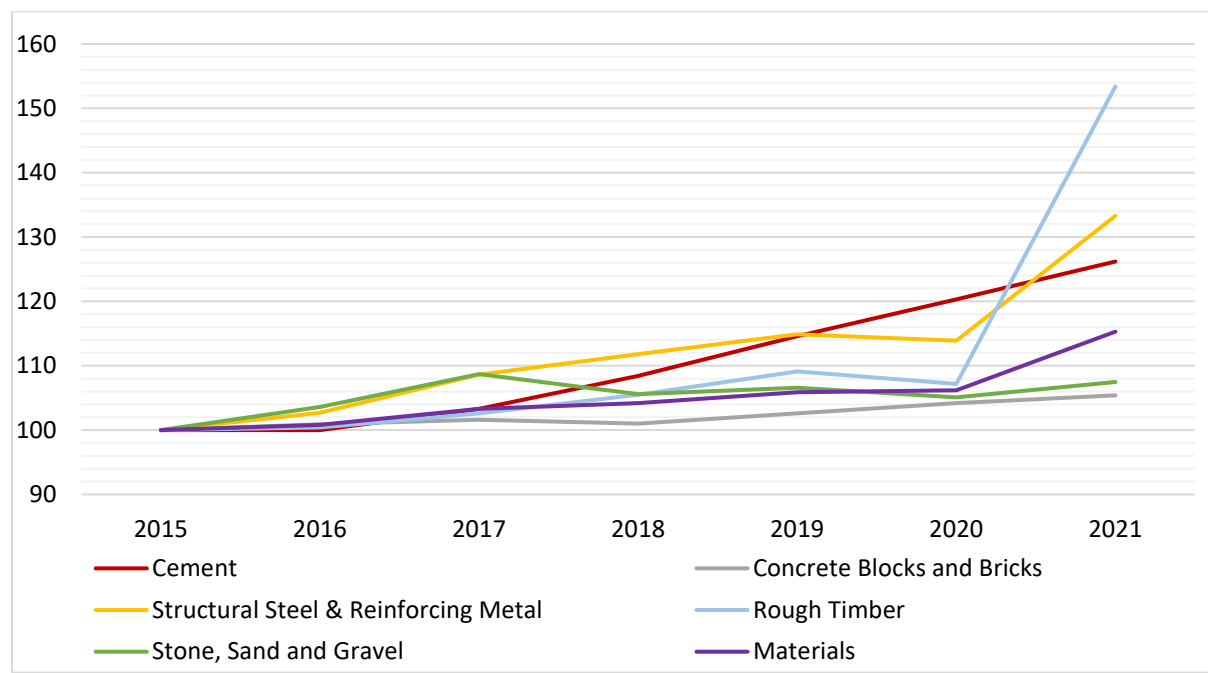


Source: Central Statistics Office.

Average weekly earnings in the Irish construction sector have been rising slowly but steadily since 2012. This likely reflects the tightening labour market and higher cost of living in Ireland. Significantly, this represents an increasing input cost as far as the construction sector is concerned. When labour markets tightened in the early 2000s, large inflows of migrants after the expansion of the EU saw an increase in the domestic labour force. However, the record numbers of inflows recorded at that time are unlikely to materialise again due to a variety of factors such as COVID-19, the relatively high cost of living in Ireland and the improving economic conditions in many of the countries where migrants came from back in the 2000s. Ahern-Flynn et al. (2021) estimate that demand for employment in the construction sector could reach 60,000 workers a year by 2025. Therefore, it is likely that this trend of increasing wages will continue.

Another significant development in the sector is that of other input costs such as the cost of materials. Very large increases in the cost of materials have been reported in Ireland, with the price of structural steels increasing by 27 per cent from February 2021 to February 2022. Similarly large increases have been reported for timber, and smaller but significant increases have been recorded for many other materials (Central Statistics Office, 2022). Figure 11 shows some of these domestic trends in input prices.

**FIGURE 11 WHOLESALE PRICE INDEX (2015 = 100)**

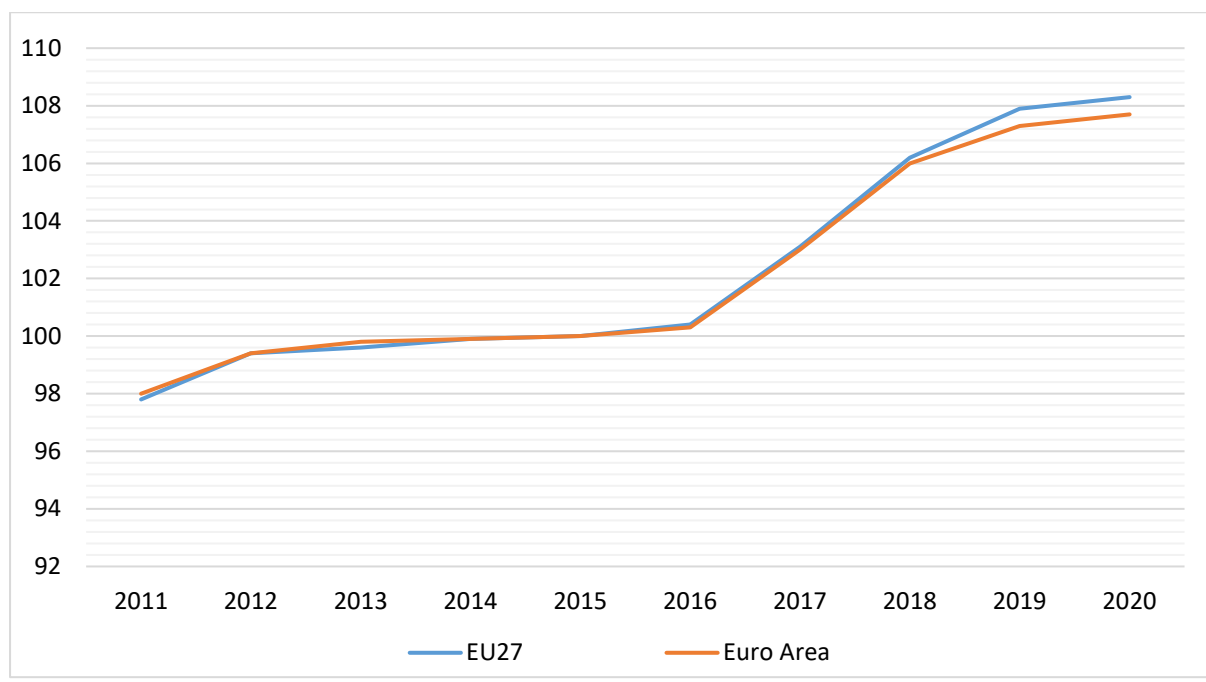


Source: Central Statistics Office.

Prices for certain inputs have increased significantly since 2020; Figure 11 highlights the sharp increase in the price of timber, structural steel and cement. The prices of other inputs, such as concrete blocks, have remained relatively stable. Nevertheless, it is clear that input prices have been increasing steadily since 2015 and are now increasing at a much faster pace.

The international nature of these price changes can be observed from Figure 12 which plots the prices for materials for both the EU27 and the Euro Area with input costs rising across Europe.

**FIGURE 12 PRICES OF MATERIALS (INDEX BASE 2015 = 100)**



Source: Eurostat.

Prices of materials have been on the rise over the past decade, with the extent of price increases intensifying from 2016 onwards. It is expected that these increases will continue also, given expected increases in demand for a number of nonferrous metals arising as a consequence of expanding renewable energies, the switch to electromobility, and additional efforts to expand IT infrastructure (Beckmann et al., 2021). Given these international factors, coupled with the large imbalance between demand and supply in the domestic housing market, the cost of inputs will likely continue to rise. Materials such as concrete, steel, wood, stone etc. are key components of housing construction and so these increased costs will have a significant effect on the construction sector's ability to produce the increased rates of housing supply required.

Domestically, the cost of land and certain issues such as 'land banking' have been subject to much discussion. This paper explores the issue of land in Section 5.4 as a greater role for the Land Development Agency (LDA) is examined as a means of dealing with these issues.

Finally, the surge in inflation observed across countries since the COVID-19 pandemic has prompted the main international monetary authorities such as the Federal Reserve and the European Central Bank to increase policy rates. The resulting impact on lending rates throughout the economy will also have significant implications for the construction and mortgage markets. This is particularly the case if the increase in rates is a precursor to a new era of higher interest rates on

a persistent basis. Some of the more significant impacts include higher mortgage repayments and hence housing demand, the business models of the buy-to-let (BTR) sector and their ability to secure capital, the cost and availability of development finance from the financial sector, and the cost of borrowing for AHBs.

### **3.3 Macroeconomic implications of increased housing construction**

In this section, we assess the overall macroeconomic impact of increased housing supply. In particular, we avail of new developments in relation to COSMO (COre Structural MOdel) (Bergin et al., 2017) which is a macro-econometric model of the Irish economy designed for both economic projections and policy analysis (for examples of its uses see Bergin et al., 2019 and Conefrey et al., 2018).

COSMO already includes a detailed financial block, which describes the evolution of variables relevant to the housing market including mortgage credit, arrears, house prices and completions. It did not, however, include a detailed construction sector, despite the overall importance of the sector to the Irish economy.<sup>9</sup> The construction sector was instead included with other activities that focus on servicing the domestic economy in the ‘non-traded sector’. Therefore, any shock or policy scenario could not separately distinguish the impacts to the construction sector or how these impacts feed through the rest of the economy. With this in mind, Egan and Bergin (2022) outline a modification of COSMO which incorporates a specific construction sector.<sup>10</sup> Incorporating specific relationships for the key variables in the construction sector provides much more realistic linkages between the activity of the real and financial economy.

The new construction sector consists of nine estimated equations, a calibrated production function as well as a number of identity equations. For the purposes of this updated version of COSMO, the construction section refers to the NACE Rev.2 sectors F and L. Sector F (Construction) includes construction of buildings (both residential and non-residential), civil engineering and specialised construction activities while Sector L (Real Estate Activities) includes the buying and selling of real estate and the management of real estate. The equations in the construction sector include estimations for the level of production, investment, employment, wages, average hours worked, profits and fossil fuel consumption.<sup>11</sup>

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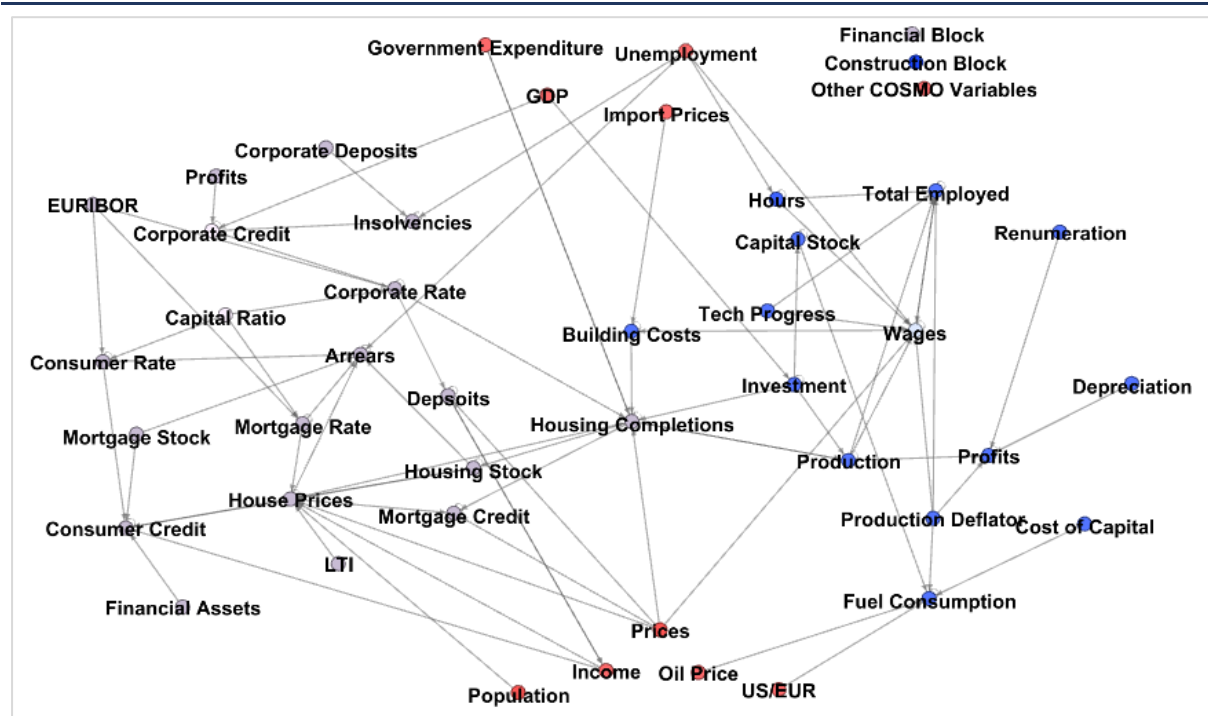
<sup>9</sup> The construction sector (composed of NACE Sectors F and L) represented 8.3 per cent of total gross value added (GVA) in 2020 and 6.7 per cent of employment in 2021.

<sup>10</sup> Note this development of COSMO was funded by the Department of Housing, Local Government and Heritage through its housing research programme with the ESRI. More details are available here: <https://www.esri.ie/current-research/housing-research-programme>.

<sup>11</sup> A full description of the estimated equations and the overall econometric structure of the construction sector can be found in Egan and Bergin (2022).

As mentioned, Egan and Bergin (2022) argue that this modification to COSMO reinforces the links between the financial block and the real economy via the construction sector. This in turn leads to richer analysis in terms of policy shocks and dynamic simulations, and nests potential changes in the construction sector within the broader real and financial economy. In particular, the newly disaggregated construction sector establishes key relationships between output in the sector, the level of dwelling completions, house prices, the level and cost of corporate lending and the wider financial side of the Irish economy. Figure 13 provides a simplified dependency graph of the construction sector, financial block and wider COSMO which emphasises the relationship between the real and financial side of the economy.

**FIGURE 13 SIMPLIFIED DEPENDENCY GRAPH OF CONSTRUCTION SECTOR, FINANCIAL BLOCK AND WIDER COSMO**



Source: Egan and Bergin (2022).

### 3.4 Shock to dwelling completions

The Government's Housing for All plan (Department of Housing, Local Government and Heritage, 2021) targets annual new dwelling completions of 35,000 units. COSMO's baseline projection for completions over the 2022-2030 period is approximately 25,000 units per annum. Therefore, we apply a representative shock by increasing the number of dwelling completions by 10,000 units. This figure represents the total number of new dwellings relative to COSMO's baseline. As the model is broadly linear, the results of shocks are relatively invariant to the baseline used. It should also be noted that the linear nature of the model also

means, however, that parameters do not depend on the state of the economy or the degree of slack in the labour market. It is also important to stress that this is very much a ‘synthetic’ shock in which completions are exogenously increased by 10,000 units to test the effect on other relevant variables. The increase is not a one-off shock, but a permanent shift in the number of completions beginning at year  $t_0$ .

The impulse responses from the shocks to the number of completions can be seen in Figure 14. As production in the construction sector is in part determined by completions, this variable rises above the baseline. Employment and wages in the sector are in turn driven by the level of production and so both also increase relative to the baseline,<sup>12</sup> with higher labour demand also serving to put upwards pressure on wages. Profits of construction firms also increase from the higher level of production. Overall, the increase in housing output of 10,000 would increase construction wages by approximately 1 per cent in the long run. This suggests that increasing housing output to 35,000 units per annum would not lead to significant wage inflation in the sector.

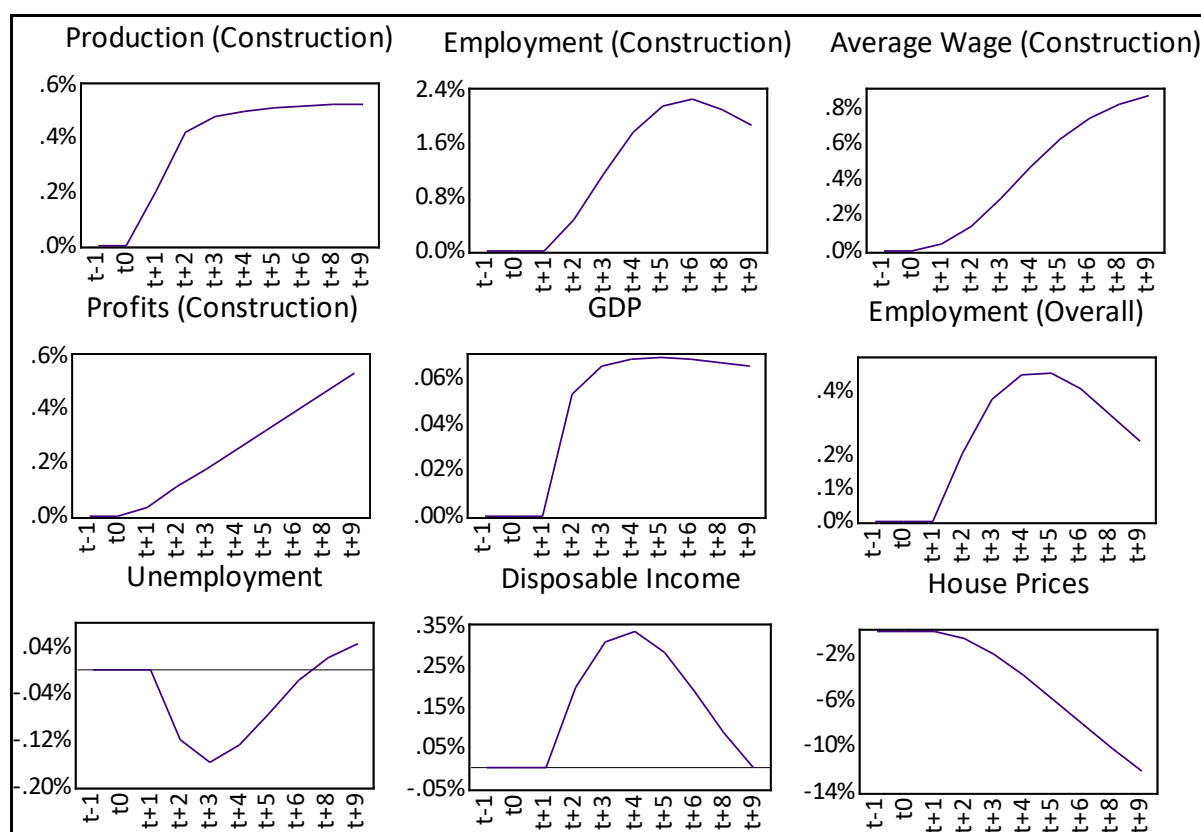
At the macro level, the increase in the production of one of the key sectors of the economy leads to an increase in GDP while the additional employment in the sector feeds into the total level of employment, thereby reducing the overall unemployment rate in the economy. The increase in wages in the construction sector also leads to higher overall disposable income. While the increased income from the strengthening economy puts upward pressure on house prices, this is strongly overridden by the large increase in the number of completions causing house prices to fall significantly below the baseline. In terms of magnitude, the elasticity of house prices would appear to be quite strong based on the simulation, with house prices falling by around 12 per cent from its baseline by year  $t+8$ . This is based on the relationship between housing completions and house prices as described in the financial block of COSMO (see Egan et al., 2022 for details). It should be noted however that this simulation assumes that the 10,000 units does not distinguish between private and social housing, and therefore simulates the impact of an increase in ‘market’ dwellings only.

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<sup>12</sup> With regard to changes in employment in the sector, the scenario described here reflects a situation in which the supply of construction labour is relatively elastic.



**FIGURE 14 10,000 UNIT SHOCK TO NEW DWELLING COMPLETIONS**



Source: Authors' calculations.

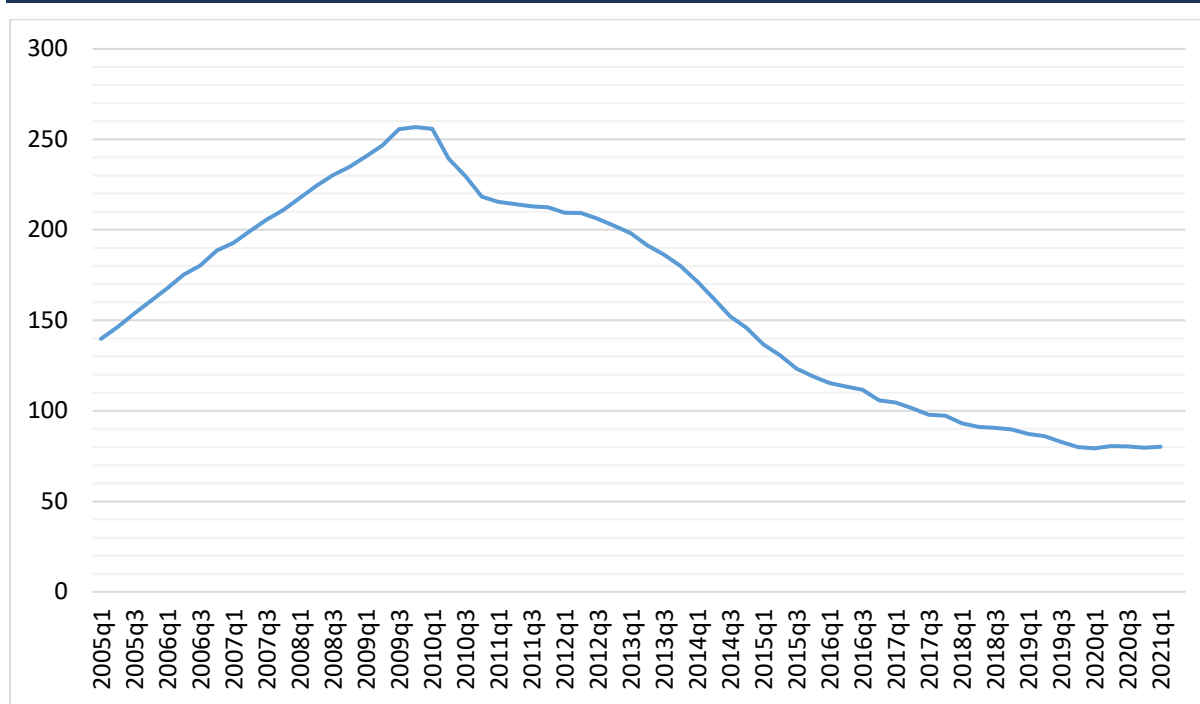
Note: All responses are in per cent deviation from the baseline with the exception of the unemployment rate which is percentage point deviation.

Of course, in an environment of higher costs, the ability to attain funds becomes more important for the viability of housing projects, both for firms and individuals. In the following section, we focus on the funding of increased housing construction.

#### 4. FUNDING OF INCREASED CONSTRUCTION ACTIVITY

The performance of the financial sector can have a major impact on the supply side of the construction sector. This is particularly the case in the Irish residential market over the period 2000 to the present. The significance of these effects were felt, in particular, after the financial crisis in 2008. Going forward, as noted by Duffy et al. (2016), there are significant challenges as to whether the financial sector has the potential capacity to meet a substantial increase in housing market activity.

Figure 15 plots total credit issued to Irish-resident private sector enterprises as a percentage of adjusted Gross National Income. This provides an assessment of the overall size of the financial sector vis-à-vis the size of the real economy.

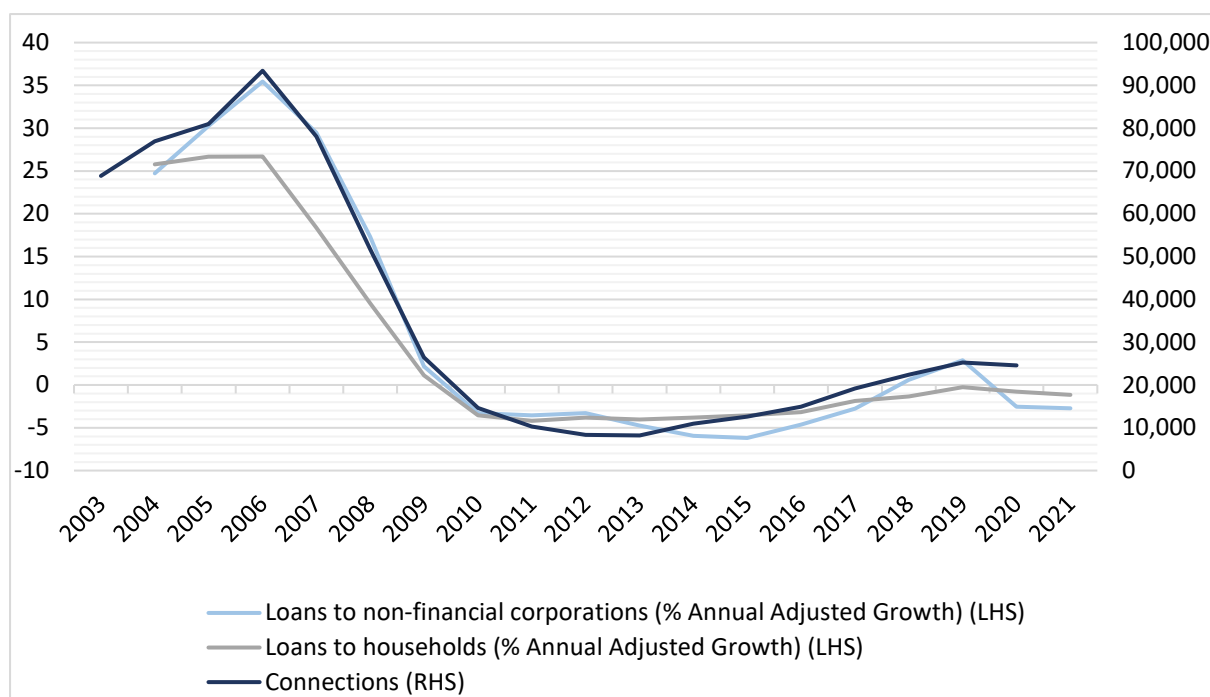
**FIGURE 15 NATIONAL CREDIT-TO-GNI\* RATIO**

Source: Central Bank of Ireland.

The extent to which the level of credit increased as a proportion of the size of the economy in the lead up to the global financial crisis (GFC) can be observed from Figure 15. Since the GFC, however, there has been a steady decline in this ratio, as the amount of credit extended decreased, and both the financial and household sectors were forced into a period of deleveraging.

A significant change in the regulatory environment occurred in Ireland after the financial crash, with a range of macroprudential regulations being introduced to prevent credit institutions from lending in an unsustainable manner as had been done during the Celtic Tiger period. This, along with a fall in demand in the residential sector, led to a sizeable decline in loan approvals to both households and non-financial corporations in the aftermath of the GFC. The growth rates of these approvals are graphed against housing supply in Figure 16, and a clear relationship can be seen.

**FIGURE 16 GROWTH RATE OF LOANS SUPPLY AND HOUSING SUPPLY**

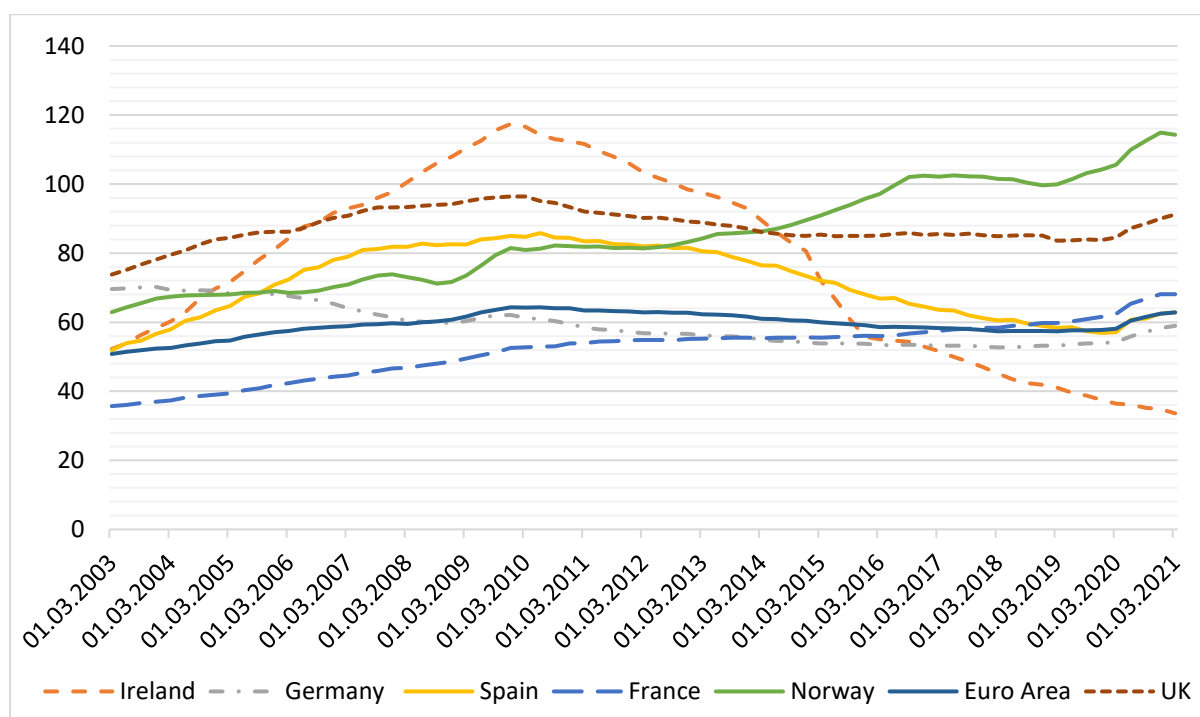


Source: Central Statistics Office.

It is clear that there is a high degree of correlation between both loans-to-households and loans-to-non-financial corporations and housing supply. This suggests that increases in housing supply may be delayed due to a lack in the availability of credit. McQuinn et al. (2021) cited the difficulty in obtaining a mortgage as preventing a significant number of people, deemed to be creditworthy, from entering the housing market due to a variety of factors including inability of certain cohorts of the population to save the required deposits now required. However, it should be noted that an increase in the provision of credit would feed into higher house prices through increased demand (McQuinn et. al., 2021; Lyons, 2021).

Secondly, and more significantly, housing supply is highly influenced by the amount of credit being supplied. It is informative to compare the Irish credit market with developments in comparable European countries. Figure 17 shows the development of household credit-to-GDP across several EU countries.

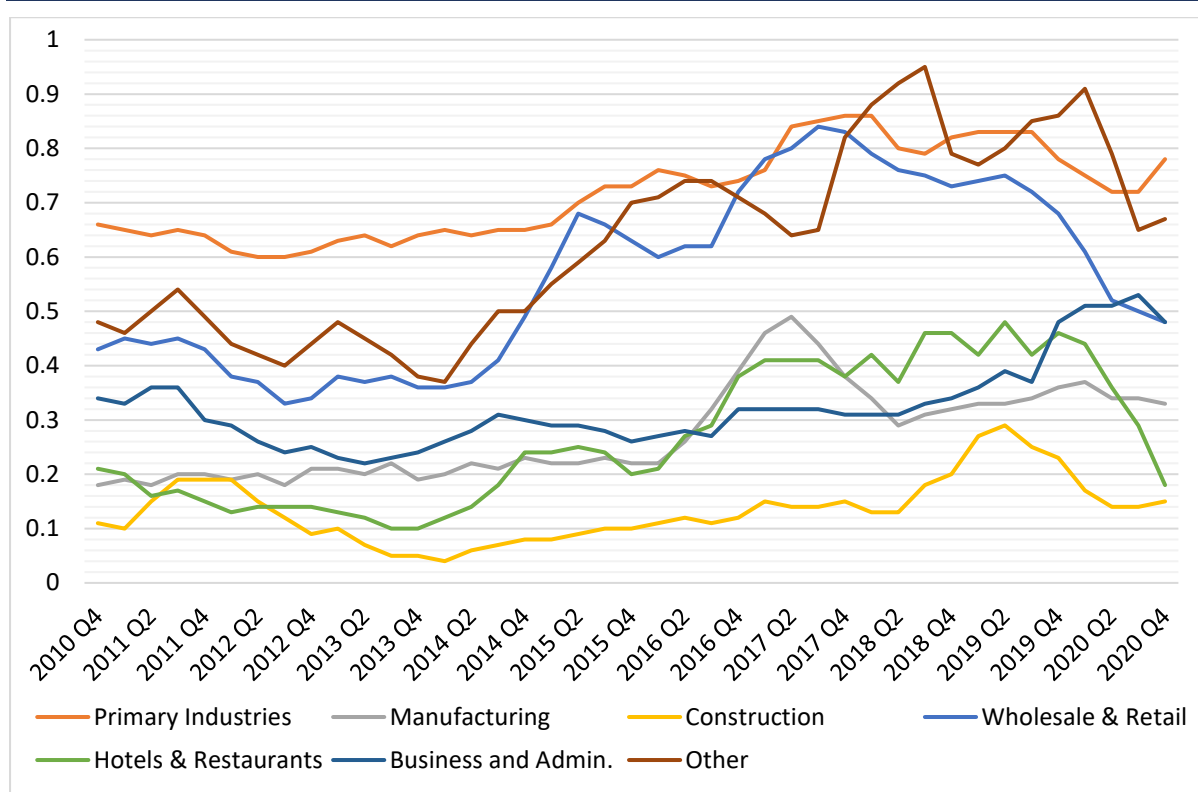
**FIGURE 17 HOUSEHOLD CREDIT-TO-GDP FOR SELECT EUROPEAN COUNTRIES (%)**



Source: Bank for International Settlements.

In a similar fashion to many of the trends examined so far, one can see that household credit in Ireland as a percentage of GDP peaked in the late 2000s, before declining substantially. The Irish ratio has continued to decline further below the Euro Area average and the ratios in other countries shown above since 2013. This is a result of declining levels of both the demand for and supply of credit. These low levels of Irish household credit also represent the stock of credit at certain points in time. Hence, it is helpful to assess gross new lending to SMEs in the Irish economy to determine if there are barriers to credit on the business side also. Figure 18 presents new lending for each sector since 2010.

**FIGURE 18 GROSS NEW SME LENDING BY SECTOR**



Source: Central Statistics Office.

Since 2014, new lending across most sectors of the economy has been increasing. It is noticeable that the growth of new lending for construction has, however, been slower than other sectors. It began to increase at a faster rate in 2018 but then declined again at the end of 2019 and into 2020. Hence, the stocks of credit in the construction sector are likely to remain lower than that in other sectors over the short to medium term.

The key question is whether the domestic financial sector has the capacity to fund its lending to the required extent going forward. Figure 19 plots total credit extended and traditional deposits for the Irish financial sector over the period 2003 to 2021. Historically, during the period of the Celtic tiger, there was a significant gap between lending and traditional deposits. This gap was funded by domestic financial institutions borrowing funds from foreign institutions (see McCarthy and McQuinn, 2017, for more on this).

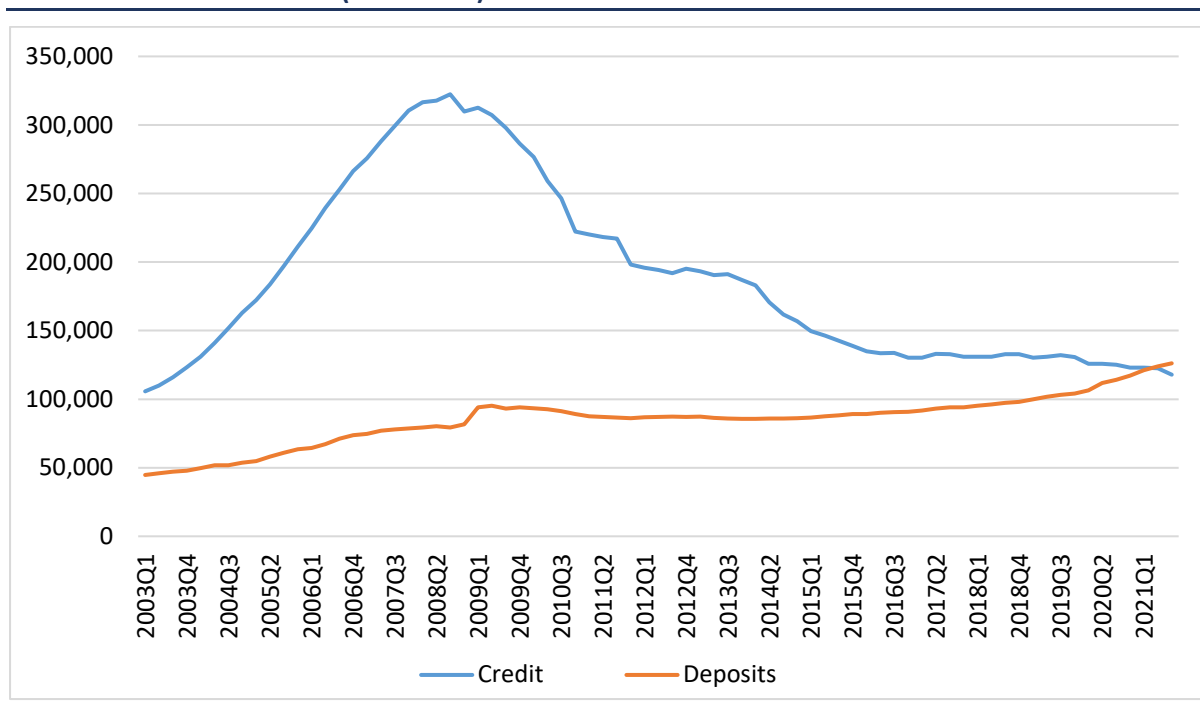
The Financial Measures Programme (CBI, 2011) which was introduced during the re-capitalisation of the Irish banking sector outlined a required path for Irish banks' loan-to-deposit ratios. This requirement on the liability side of their balance sheets sought to address one of the key fragilities of Irish banks' balance sheets, which was the overreliance on short-term wholesale funding (Honohan et al., 2010).

The issue is that banks face a maturity mismatch between their assets and liabilities which gives rise to liquidity risk. Retail deposits, particularly those of households, are viewed as less vulnerable to investor flight and thus not subject to the same roll-over risk that characterises short-term money market funding.

The impact of the financial crisis along with the regulatory changes which accompanied it has meant that Irish financial institutions have to rely on traditional deposits as their main source of funding. From the graph it is clear that at present both credit extended and deposit levels are broadly similar. This suggests that it would require a significant increase in the level of deposits to fund a sizeable expansion in bank credit. Consequently, there are significant question marks concerning the potential for the domestic financial system to fund the expansion in housing activity required to meet the underlying demand in the market.

A related legacy of the financial crisis is the need for Irish financial institution to carry relatively greater levels of capital for any increase in lending. Real estate lending requires larger risk-weights for Irish institutions as they still hold a significant amount of non-performing loans from the 2007-2010 period. This also serves to limit the capability of the domestic financial sector from increasing its lending levels.

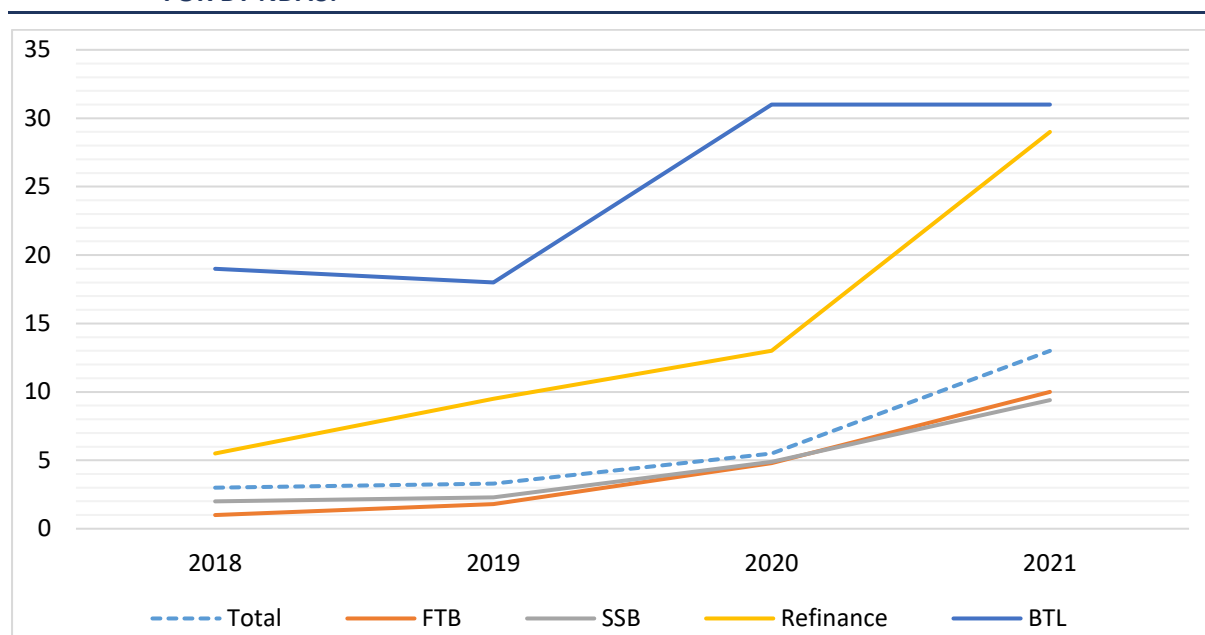
**FIGURE 19 TOTAL CREDIT EXTENDED AND TRADITIONAL DEPOSIT LEVELS AMONGST IRISH CREDIT INSTITUTIONS (€ MILLION): 2003-2021**



Source: Central Bank of Ireland.

Most of the discussion around lending has centred on traditional bank lending, however, the overall financial landscape of the Irish residential market is now much more mixed. The role of approved housing bodies (AHBs) has expanded over the last decade in an attempt to increase the volume of affordable housing. There has also been a large increase in the activity of Non-Bank Financial Institutions (NBFIs) over the last 20 years, particularly from REITS and investment funds (Gaffney and Hennessy, 2022; Lyons, 2021). The greater financial mix is a positive development in the Irish market as it promotes competition in the financial sector. NBFIs can also offer informational advantages to borrowers in one particular sector. It should be noted that non-bank finance also tends to be quite volatile and highly cyclical, particularly if regulation of these bodies is inadequate. Fleckenstein et al. (2020) show that cyclicalities in non-bank finance explains a large share of the lending decline during both the financial crash and the COVID-19 pandemic. Nevertheless, NBFIs have seen their market share in the Irish mortgage market grow significantly since 2018, particularly in refinance and buy-to-let mortgages. This can be observed from Figure 20, which plots the share of total new mortgage lending in each market segment accounted for by NBFIs over the period 2018-2021.

**FIGURE 20 SHARE OF TOTAL NEW MORTGAGE LENDING IN EACH MARKET SEGMENT ACCOUNTED FOR BY NBFIS:**



Source: Gaffney and Hennessy (2022).

## 5. POLICY OPTIONS

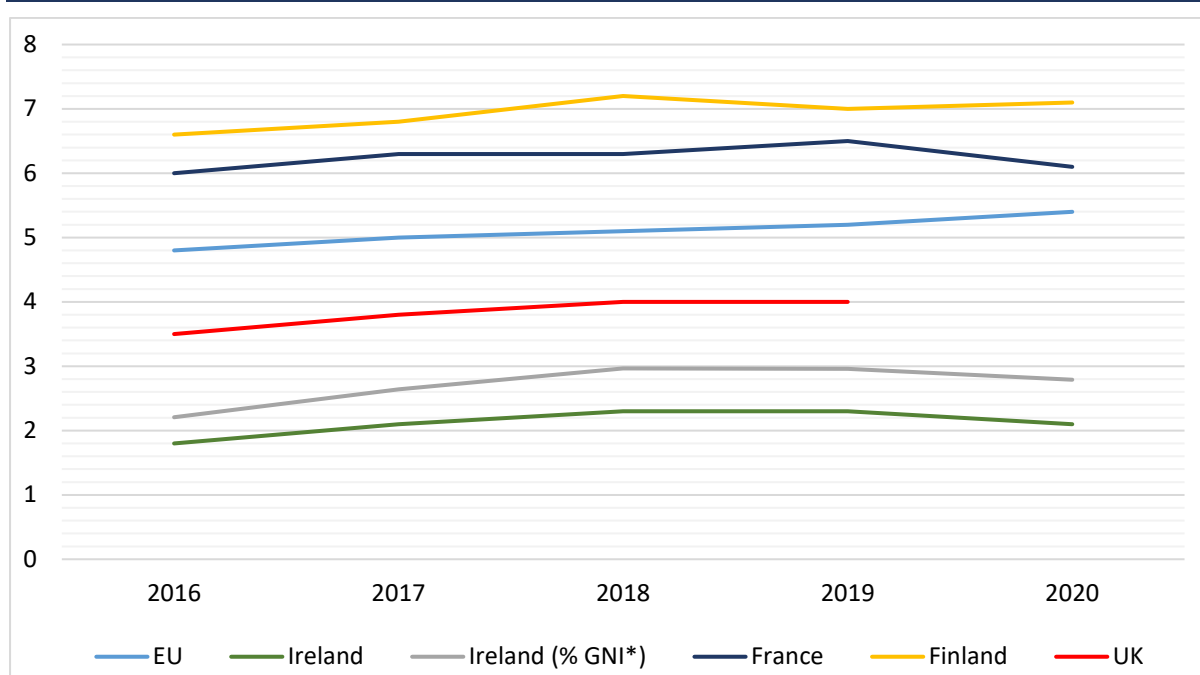
Having outlined many of the challenges which are likely to confront the domestic economy in significantly scaling up housing construction, in this section we outline a number of possible policy actions that could be taken to ease the burden many of these constraints impose.

## 5.1 Public investment

Investment is an important resource in the provision of housing. Section 2.1 recognises this importance by examining GDFCF in different sections of the construction sector. Section 4 also acknowledges this by examining the current financial markets and allocation of credit as these areas have a large impact on the private sector's ability to invest and produce housing units. This section seeks to take a closer look at Irish investment in housing in comparison to other European countries. Figure 21 shows the levels of investment in housing as a percentage of GDP across several European countries.

Investment is an important indicator in the provision of housing. Section 2.1 examines GDFCF in different sections of the construction sector, while Section 4 evaluates current financial markets and the allocation of credit which have a large impact on the private sector's ability to invest and produce housing units. This section seeks to take a closer look at Irish investment in housing in comparison to other OECD and European countries. Figure 21 shows the levels of total investment in housing as a percentage of GDP across several European countries.

**FIGURE 21 INVESTMENT IN HOUSING (GDFCF % GDP)**



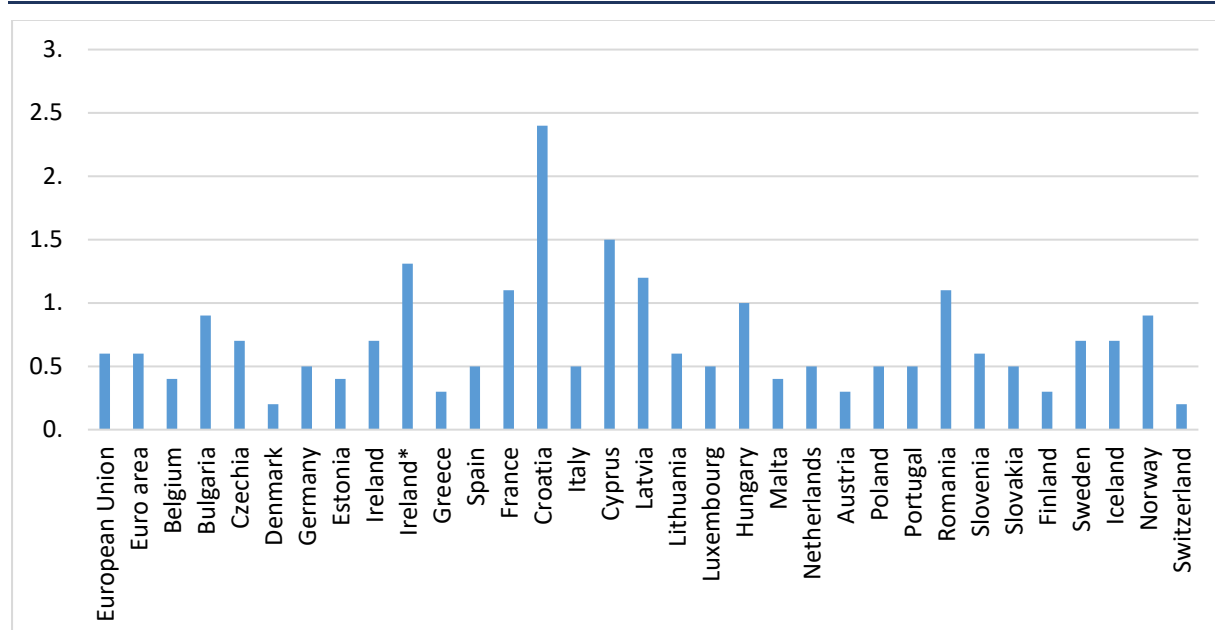
Source: Eurostat.

Ireland's levels of investment as a proportion of GDP and as a proportion of GNI\* are somewhat lower than many other European countries in recent years and lower than the EU average.



In terms of public expenditure on housing it is useful to compare domestic expenditure levels with those of other European countries. Eurostat publishes data on 'Government expenditure on housing and community amenities'.<sup>13</sup> This is based on general government expenditure data for 'housing and community amenities' (according to the Classification of the Functions of Government – COFOG).<sup>14</sup> Figure 22 presents data in 2020 for a sample of European countries as a percentage of GDP.

**FIGURE 22 TOTAL GOVERNMENT EXPENDITURE ON HOUSING AND COMMUNITY AMENITIES, 2020 (% OF GDP)**



Source: Eurostat.

From the graph it is clear that when expressed as a percentage of GDP, Irish expenditure levels are at the average rate across countries (0.7 per cent of GDP). However, this changes when the expenditure level is expressed as a percentage of GNI\* (Ireland\*). In that instance, expenditure levels are 1.3 per cent of national income.<sup>15</sup> Nevertheless, as noted in OECD (2020) on average across 32 OECD countries for which data are available, public investment (capital transfers as well as direct investment) in housing and community development increased gradually from 2000 up until the Global Financial Crisis, followed by a significant decline in the years after the GFC. Since then, public investment has, on average, failed to return to 2000 levels.

<sup>13</sup> [https://ec.europa.eu/eurostat/databrowser/view/gov\\_10a\\_exp/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/gov_10a_exp/default/table?lang=en).

<sup>14</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Classification\\_of\\_the\\_functions\\_of\\_government\\_\(COFOG\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Classification_of_the_functions_of_government_(COFOG)).

<sup>15</sup> Not all publicly provided housing is included in this amount. For example, in an Irish context output from approved housing bodies (AHBs) and the Housing Finance Agency (HFA) is not included.

A number of commentators have called for greater levels of State investment in the domestic housing sector. McQuinn (2021) highlights how the current interest rate regime and forecasted growth rates for the Irish economy make it possible to provide for a significant increase in public sector funding for housing investment. This may be accompanied by policy changes of the EU fiscal rules, which could see national Governments enabled to provide greater levels of public investment in areas such as housing.

Finally, the onset of a higher interest rate environment does introduce a note of caution as far as increased government borrowing is concerned. Because of this changed policy environment, the Irish Government, like most Western economies, is less well placed to increase government borrowing than it was at the onset of the recent inflationary period.

## 5.2 Vacant homes

Greater use of vacant homes is another policy option to address the imbalance between housing demand and supply. In GeoDirectory's most recent *Residential Buildings Report*, they identify 90,158 vacant homes and 22,096 derelict homes. These homes are spread across the country, with lower vacancy rates in urban areas and the Greater Dublin Area (GDA). Nevertheless, these homes represent finished units that are lying idle. Therefore, some of these 90,158 units could be added to the housing stock with much less labour or materials than would be needed for the same number of new units.

There is some debate on how it would be best to bring these vacant units into the housing stock, with some wanting local authorities and Approved Housing Bodies to play a large part in order to allow for an increase in the stock of public and affordable homes. Others have suggested grant schemes to aid individuals to purchase and rejuvenate these units. However, it has been claimed by many that grant schemes such as this can place further upward pressure on prices (McQuinn et al., 2021). One policy that has been implemented as part of Budget 2023 is a tax on vacant homes, which will charge those who own homes and allow them to remain vacant. It is hoped that this will bring vacant housing into the market.

Another initiative to be welcomed in this regard is a compulsory purchase order scheme (CPO) which is being introduced by local authorities.<sup>16</sup> The proposal is that

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<sup>16</sup> [https://www.gov.ie/en/publication/256b4-vacant-homes/?referrer=http://www.housing.gov.ie/housing/home-ownership/vacant-homes/vacant-homes#:~:text=Compulsory%20Purchase%20Order%20\(CPO\)%20Programme%20for%20Vacant%20Homes,-A%20major%20programme&text=It%20is%20expected%20that%20local,not%20suitable%20for%20social%20housing.](https://www.gov.ie/en/publication/256b4-vacant-homes/?referrer=http://www.housing.gov.ie/housing/home-ownership/vacant-homes/vacant-homes#:~:text=Compulsory%20Purchase%20Order%20(CPO)%20Programme%20for%20Vacant%20Homes,-A%20major%20programme&text=It%20is%20expected%20that%20local,not%20suitable%20for%20social%20housing.)

local authorities will purchase vacant properties through their compulsory purchase powers even where these dwellings are not suitable for social housing.

### **5.3 Modular homes**

Another policy option is the greater use of technology in addressing the need for greater levels of construction. There are now alternative methods of construction that could overcome constraints on labour and materials as well as provide better value for money, and do so with a smaller carbon footprint.

One such method is that of factory-built (or modular) houses. This refers to houses that are made in factories off-site. The different elements of the house are then transported and assembled on-site. This method requires much less labour, produces housing units approximately 50 per cent faster than traditional methods and is typically 10-20 per cent cheaper (Eastman and Sacks, 2008; Hussein et al., 2021; MacAskill et al., 2021). This method also ensures a factory-standard house that can be quality assured. The carbon footprint of these houses is smaller than traditional houses due to less waste and higher energy efficiency (Hussein et al., 2021). Finally, these houses can be mass produced, which could see the delivery of a high volume of housing in a short-space of time (Murray, 2018). It is acknowledged that establishing a factory (or factories) would constitute a significant expense, therefore a commitment to build a certain number of units is required for the approach to be cost efficient. An example of a company producing these houses is BoKlok – an IKEA-owned company that produces factory-made housing in Sweden, Norway, Finland and the UK. BoKlok produces timber-frame houses quickly and at low cost.

Other methods include 3-D printing and new alternative inputs. The obvious advantages to these alternative methods are that they would aid in overcoming labour shortages and large increases in the prices of materials. However, there are other advantages also. These methods would be much more environmentally friendly as they could produce houses using low-carbon materials. They also produce much less waste and are more efficient when produced at scale.

The use of modular construction on a widespread basis may also present an opportunity for ‘crowding in’ between the State and the private sector. A commitment by the State to build a certain number of modular units per annum may lead to the production technology being more commercially viable in the Irish market and hence available to the domestic construction sector.

Also, the greater use of modular homes would help with increased output in the residential property market being consistent with the emissions targets outlined for the construction sector under the Government's Action Plan on Climate Change.

#### **5.4 Land market**

Another area where policy could potentially have a significant impact is in greater regulation of the land market. Sweeney (2022) recently outlines key difficulties with the Irish land market. Land prices in Ireland have been volatile historically, with changes in house prices causing land prices to vary substantially mainly due to land speculation.

A key recommendation from Sweeney (2022) is that a national agency such as the Land Development Agency be used to acquire and regulate the use of land for residential development. Such a body would have the capacity to acquire both public and private land and develop the land for residential purposes. This would result in the speculative component of land prices being greatly reduced resulting in a potentially sizeable reduction in a key cost of housing construction. It would appear that this is one area where domestic policy could have a significant impact on the cost of building a house.

However, it should be noted that given the highly litigious nature of the Irish property sector, the legal challenges in acquiring land in this manner would likely be significant.

Fully serviced land could then be allocated to the LDA, the local authority, an AHB, or to the private market. This would lead to active land development and centralised land management based on long-term planning. It would also avoid the possibility of private developers, local authorities, and AHBs all attempting to acquire the same development land causing the price to increase.

#### **5.5 Labour supply**

As discussed throughout the paper, labour supply will be an extremely important element of increased residential construction. Hence, labour supply policies will be required to ensure that labour supply is sufficient. As discussed in Section 2, an increased level of employment has been concentrated in the commercial or non-residential side of the construction sector since 2013. This is largely due to the fact that there is simply a greater level of activity in the commercial construction sector at present. If the State were to increase investment and commit to building a large number of units per annum, the increased activity would cause an increase in the demand for labour for residential construction. This would see a greater number

of construction workers shift to the residential side of the sector. Additionally, as was mentioned above, it is believed that larger levels of State involvement would lead to increased private investment due to lower perceived risk, i.e. crowding in, which would likely see further movement of labour and also investment from the commercial construction sector to the residential construction sector. This would make sense given the current trajectory of remote/hybrid working and the effect that will have on the demand for office space.

Additionally, the importance of migration historically has also been discussed in Section 2.2. In order to attract construction workers to Ireland, it is worth considering the addition of certain construction skills to the Critical Skills Employment Permit (CSEP) list. The CSEP has historically been used to attract high-skilled workers such as ICT and Engineering professionals and also workers whose skills are deemed in short-supply, such as nurses and midwives. Therefore, certain roles/skills in the construction sector could be identified and added to the CSEP list to attract workers currently in short supply. These skills may include bricklayers, carpenters, roofers, electricians, and other roles that are fundamental to the building process.

It is also possible to source these skills and workers domestically through training. One avenue the government has been keen to explore is that of apprenticeships, with the launch of an action plan in 2021 with the goal of increasing the number of registered apprentices to 10,000 per year by 2025. The action plan sets out to achieve this by creating a new National Apprenticeship Office to drive reforms. The State will provide a grant for employers to take on apprentices with a top-up grant for certain skills, such as the construction skills listed above, as well as non-financial supports such as recruitment and supervision of apprentices. It is understood that the public sector will also begin to offer apprenticeship positions.<sup>17</sup> It is important that the provision of these training schemes would be impervious to the business cycle in the construction sector. The occurrence of the financial crash in 2008 resulted in a large decrease in construction activity and a decrease in construction apprenticeship registrations of 93 per cent during the economic downturn (Ó Murchadha and Murphy, 2016). The apprenticeship model in Ireland is yet to fully recover, and this has contributed to the skills shortage observed in the sector today. A notable feature of apprenticeships is that they do not just provide cheap labour in the form of semi-skilled operatives, they also develop young workers into construction managers and other skilled roles where a background in the sector is key (Ó Murchadha and Murphy, 2016). Hence, increased apprenticeship and

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<sup>17</sup> The Government's action plan can be read here: 00c012f4-531c-4578-b8bb-179db4351939.pdf ([www.gov.ie](http://www.gov.ie)).

training programmes will also prove an important source of labour in the coming years.

## **6. CONCLUSION**

This paper has identified potential constraints in many areas of the Irish economy as the domestic construction sector is set to increase its scale of residential output. These constraints range from employment and migration to financial and funding conditions. It is clear that a number of constraints are evident in the provision of extra housing. Furthermore, it is evident that the recent period of inflationary pressures observed generally will exacerbate some of these pressures. The paper has also availed of new developments in COSMO, the macroeconomic model of the Irish economy, to examine the impact of increased housing construction on a number of key housing and general economy variables. This has the benefit of nesting analysis of the residential sector within the broader economy.

The paper has also proposed ways of ameliorating over the medium to long term the challenges that are identified in scaling up housing output. This is possible through increased State investment in the housing sector, tackling vacant housing, diversifying production methods and structural reform of the land market. These policies would lead to a larger public and affordable housing stock, a greater balance of investment between the residential and non-residential sides of the construction sector, and in certain instances the 'crowding in' of private investment in the market.

Finally, it is imperative that any policy measures introduced to stimulate activity in the housing market must be consistent and coherent with those necessary to achieve the targets set out in the Government's Action Plan on Climate Change.

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