Special Article

A Review of Housing Supply Policies

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Introduction

The significant variation in house prices observed across many OECD countries has attracted much attention and resulted in a greater level of understanding of the demand side of housing markets. The international literature on house prices has, in light of the many housing booms and busts observed, increased substantially. However, less attention has been devoted to understanding the supply side of the housing market. Vermeulen and Rouwendal (2007) note that in spite of a growing recognition of the importance of supply conditions for the level and volatility of house prices and the demand for housing, empirical work on housing supply outside the US is still relatively scarce. To some extent this has been due to a lack of appropriate supply-side data. However in recent times this issue has become less of a problem.

Gyourko (2009), amongst others, has highlighted the fact that a thorough understanding of not only demand but also supply is essential for understanding the workings of any market. Recent developments in housing markets internationally have led to a heightened interest in the supply side of housing markets.

It is a stylized fact that the supply response, internationally, to demand-side factors such as income, interest rates, house prices and demographic pressures can vary substantially. There are many potential reasons or 'frictions' for the heterogeneity observed in supply. Given the importance of regulatory costs along with building costs as a key determinant of supply responsiveness, certain economies have attempted to overcome supply-side 'frictions' through government interventions. As outlined by Barker (2004) these interventions can include economic instruments, such as taxation, which influences choices by altering incentives in the housing market; regulation, which can determine the amount of housing that can be supplied, its location and nature; and finally subsidies, which take the form of the provision of social and affordable housing, which primarily address issues of equity.

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These interventions can and do lead to varying outcomes and so it is important that certain aspects of the housing market are considered before implementing such policies. For example, one needs to determine and understand the causes of under-supply of residential housing in the economy. If it is related to issues of land availability then interventions such as land or property taxes may be most appropriate. In Denmark for example land taxes have been introduced which increase in line with land prices which generally results in land becoming available when most needed. A recent OECD report[2] identified the flip-side to lagging housing supply however. It noted that in countries with relatively flexible supply, housing investment adjusts more rapidly to large changes in demand and this contributes to more cyclical swings in economic growth, as witnessed in recent developments.

While there has been a significant body of research devoted to analysis of Irish house price movements, there has been only a handful of studies examining the supply side of the Irish market. Kenny (1998), for example, in noting that Irish housing supply is very inelastic in the short-run, also re-examines the relatively high cost of supply, the durability of supply, and its heterogeneity. These issues were initially highlighted in a previous study by Quigley (1992). Smith et al. (1988) also examine the extensive involvement of government as a significant cause of inelasticity in the Irish case.

Therefore, it appears especially opportune at this stage of Ireland's economic recovery to assess our current understanding of the supply side of the housing market. In particular, the purpose of this review is to provide insight into the types of cross-country interventions aimed at stimulating housing supply and assess the implications of this for the Irish market. The rest of this paper is laid out as follows; in the next section we review cross-country estimates of housing supply elasticities, this is followed by a review of taxation and incentives, with subsequent sections addressing the role played by infrastructure, access to development finance and planning regulations. A final section offers some concluding comments.

Supply Elasticity

Across all aspects of the housing supply literature, the issue of supply responsiveness or elasticity is emphasised. Malpezzi and Maclennan (2001) shed light on the fact that most housing models, and most policy analyses, hinge on explicit or implicit estimates of the price elasticity of supply of housing.

[2] Andrews, D., A. Caldera Sanchez and A. Johansson (2011). 'Housing and the economy: policies for renovation', *Economic Policy Reforms: Going for Growth.*

In an earlier contribution, Quigley (1979) highlights the real analytical difficulties for modelling supply. Unlike other markets where one observes price per standard unit, in the housing market, housing expenditure is observed. There is however no standard housing quantity since each unit can vary considerably on many quality dimensions. Similarly, it is difficult to ascertain supply based on type, as for example one large house may be re-developed into several smaller apartments. In order to understand the micro foundations of housing supply, Quigley (1979) asserts that several key pieces of information are required such as the quality and quantity of housing services offered by the supplier as well as maintenance and capital improvement decisions, rents, and asset values.

It is therefore important, when introducing regulations and policies dealing with supply, to understand how the market, in terms of housing supply and house prices, responds to demand-side shocks.

It is well documented that the United Kingdom housing market is extremely unresponsive to any changes in price. In terms of elasticities, Barker (2003, 2004) notes that UK house building is only half as responsive as the French, a third as responsive as the US and only a quarter as responsive as German house building. Swank et al. (2003) derived similar estimates in their analysis (see Table 1). Barker (2003, 2004) does, however, observe that international comparisons of supply elasticities need to be treated carefully because of structural differences in the way the house building industry operates.

Ball et al. (2011) comment further on the observation made by Barker (2003, 2004) and claim that differences in supply elasticities occur because of differences in measurement. Numerous models in the literature concentrate on the responsiveness of housing supply to the level of house prices while others concentrate on the response to the change in prices. Uniformly in the literature, the price elasticity of supply with respect to changes is much higher than with respect to levels. They highlight that international estimates can be found that range from approximately zero to infinity, but this is clearly not helpful for policy.

Despite differences in the methodologies used to calculate elasticities there does appear to be an emerging consensus on the main variables that affect housing supply and new construction. These include house prices; construction costs;

credit costs and availability; topology; land use regulation, uncertainty and impact fees.[3]

In relation to boom-bust cycles, Pryce (1999) estimates that the elasticity of supply of housing during booms (0.58) is smaller than during slumps (1.03) in the UK market. He also estimates the supply of land to be more stable over the cycle and marginally greater (0.75) during booms than during slumps (0.71). This means that housebuilders can be more responsive when prices are falling (through cuts in housebuilding levels), than when prices are rising (through increased activity). This is partly because of the long time-lags that are needed to increase the amount of land – the main factor of production.

TABLE 1 International Comparison of Price Elasticity of the Supply of New Housing

Country	Supply Elasticity
Germany	2.05
United States	1.40
France	1.09
Denmark	0.66
United Kingdom	0.45
Netherlands	0.30

Source: Swank, J., J. Kakes and A. Tieman (2003). 'The housing ladder, taxation, and borrowing constraints'. *Research Memorandum 0209.*

Note: Time periods over which the estimates are made are: UK: 1976-1999; Germany: 1976-1999; France: 1981-1998; Netherlands: 1976-1998; Denmark: 1980-1999; US: 1970-1999.

Analysis of the supply side of the market including the elasticity of supply is still relatively limited outside of the US and the UK. However we do know, from OECD estimates,[4] that in both North America and certain Nordic countries the long-run price responsiveness of new housing is quite strong. This compares to continental European countries where the relationship is much weaker. Swank et al. (2003) provide an international comparison of price elasticity of the supply of new housing (see Table 1). While caution is warranted in terms of comparisons it is interesting to note the substantial gap between Germany with elasticity greater than unity and that recorded for Netherlands. Differences in mortgage interest deductions, as highlighted by the authors, may go some way to explaining the different elasticities in the Netherlands and the UK and Denmark.

[3] An impact fee is a fee that is imposed by a local government within the United States on a new or proposed development project to pay for all or a portion of the costs of providing public services to the new development. In Ireland impact fees are equivalent to development fees.

[4] Andrews, D., A. Caldera Sánchez and Å. Johansson (2011). 'Housing and the economy: policies for renovation', OECD *Economic Policy Reforms: Going for Growth*.

Taxation and Incentives

There have been a number of reports on the tax incentives, such as the Urban-, Town- and Rural-Renewal schemes, introduced in the early nineties to incentivise construction in the Irish Economy. While helpful in contributing to significant economic regeneration, it is generally accepted that many of the incentives introduced in this period were extended to such an extent that any benefit generated was outweighed by the associated costs.

Williams and Boyle (2012) draw on research that confirms that selective tax waivers and other incentives for developers, investors and residents can play a significant role in improving the physical and economic environment in cities. In the analysis of property market failures in Dublin, Williams and Boyle (2012) focus on the role of property tax incentives in urban regeneration and provide an overview of the benefits, costs and impacts of the incentives from an urban development market perspective. The research shows that property-based tax incentives were, in the period 1986-2011, initially successful in achieving physical development objectives. The research also highlights critical issues that arose in the latter years of the period. Most notable is the fact that successive governments failed to terminate interventions once market development activity recovered.

Both Indecon (2005) and Goodbody (2005) review the various policies introduced to stimulate construction in the lead up to the housing boom. Indecon (2005), on behalf of the Department of Finance, preformed a major review of tax incentives in place in 2005. The report provides a positive assessment of many of the schemes. For example, in discussing capital allowances for hotels and holiday camps, they noted that

> *the existence of the tax incentive (had) improved both the quality and quantity of supply and the levels of investment experiences since 1997 would not have occurred in the absence of the incentive.*

However, they expressed a clear view that many of the schemes were no longer needed by 2005 and that their continuation could have negative consequences and in particular would constitute a deadweight which was becoming evident in the property-related reliefs.

Central to the report's findings were the recommendations that the decision to introduce any new incentives should be informed by a formal assessment of the likely costs and benefits. In conjunction with this, any tax incentive schemes which are introduced should have a defined lifespan of a maximum of three years

and extensions should only be considered after evaluation of the results of a formal cost-benefit appraisal.

Goodbody (2005) on the other hand reviewed area-based schemes as part of a broader review of tax reliefs. With respect to the Urban Renewal Scheme they comment that 'the scheme has had very positive effects on dereliction' and also that it has 'enhanced housing output in the target areas'. Like Indecon (2005), Goodbody (2005) expressed a view that the need for such schemes had passed by 2005.

Goodbody (2005) also note that the tax benefits of the Urban Renewal Scheme had accrued to a relatively small number of high-income earners and so ran counter to policy objectives on income distribution. They also note that the scheme had led to inflation in property prices. This point on the impact of property-related tax reliefs on property prices was taken up by Regling and Watson (2010) who argue that these tax reliefs contributed to the property bubble of the 2000s. They also argue that extension of tax reliefs (property-related and others) added to the erosion of the tax base which was so problematic when the crash of 2008 occurred.

The examination of the various schemes introduced prior to the housing boom indicates that while the schemes appear, for the most part, to have been initially beneficial for the economy, the issues lay in the fact that many schemes were extended several times over without adequate cost-benefit analyses being conducted.

The *Urban Regeneration and Housing Act 2015* was signed into law in Ireland in 2015 and has become widely known as the 'use it or lose it' act. The Act has been introduced as part of the Construction 2020 Initiative and focuses primarily on the vacant site levy and revisions to planning development contribution and the social housing provision. Both Property Industry Ireland (PII) and the Society of Chartered Surveys Ireland (SCSI) published reports in 2014/2015, focused on the issues in the Irish planning system which they believe may cause or are currently causing the biggest impediment to housing supply in the country. The vacant site tax is one aspect quite similar to that recommended below, in Hüfner and Lundsgaard (2007), to make available unused land.

The report from the SCSI agrees with the vacant site tax in principle but it maintains a level of concern regarding its timing and suitability in the current market. The report notes that it may not always be economically viable to build

on sites around the country, particularly in regions outside of urban areas where there may not be a demand for housing.

Sweden has a housing supply problem insofar as developments are not generally located where the greatest demand arises. In order to tackle the challenges in Sweden, Hüfner and Lundsgaard (2007) propose a system similar to that introduced in Denmark which deals with the issue of incentives. Barker (2004) details this locally levied land value tax which increases in line with land prices and thus rises as development pressure grows. This provides landowners with a direct financial incentive to release suitable land for development when the market demands it most. Muellbauer (2005) argues that a similar system in the UK would generate efficiency and stabilisation gains for the economy as a whole and improve the functioning of the land use planning system.

Land and property taxation across Europe varies substantially. Policy Exchange (2013) reports, in detail, the taxation choices of the UK and compares it to other OECD countries. It concludes that all countries tax property and land through a mixture of capital gains, inheritance and small annual levies on the value of property. Interestingly, they highlight the fact that a reasonably modest proportional taxation of property has not had the impact previously thought. For example, despite high levels of taxation, countries such as the US, UK and Australia have experienced very volatile housing markets. In recent years the UK has taken steps to encourage supply in the housing market by making low valued properties, new and existing, temporarily exempt from stamp duty. Meullbauer (2005) claims that both stamp duty and capital gains tax are relatively poor forms of property taxation, with new housing in the UK amounting annually to just 1 per cent of housing supply.

The level of revenue raised from property taxes in Germany has been low for several years; property tax share of GDP was 0.9 per cent in 2011. The German system of taxing property varies in terms of the valuation date used to generate the notional value and the actual tax rates. In many cases the values are based on valuations as far back as 1935. This means that rates in these particular areas range from 5-10 per cent compared to rates of 0.26-0.35 per cent in other areas. It is worth noting that the growth in housing supply in Germany has been the result of flexible planning systems and the tight control of the money supply by the Bundesbank and the European Central Bank post-1999.

While comparisons in housing supply are drawn between Ireland, the UK, US and Europe it is worth noting at this stage that market conditions vary considerably across countries. The UK and the US, as well as Ireland, experienced quite rapid

growth in credit supply in the late 1990s which fuelled the demand for housing and subsequent housing boom. Credit conditions in many European countries and in particular Germany were much more constrained as outlined above. Additionally demographic aspects vary quite substantially across markets. A younger demographic in countries like Ireland and the UK will result in greater household formation in the coming years and thus a greater need for appropriate levels of housing supply.

A report from the National Economic and Social Council (NESC) in 2004 outlines the experience in the US where extensive use of land value taxation was used in Pittsburgh in particular. The city restructured its property taxes so that land was taxed at approximately five times the rate of structures. It was believed that land value taxes, unlike taxes on labour and business, did not inhibit activity. Research (Oates and Schwab (1997) suggests that such taxes and the approach taken above may act to inflate any property bubbles that may develop. Pittsburgh has since moved to a conventional property tax.

In terms of subsidies available to the market, DiPasquale (1997) concludes that subsidising developers to produce rental housing for moderate-income households tends to displace private construction and as a result generates no increase in the housing stock. The fundamental concern is the extent to which these production programmes increase the size of the rental housing stock or simply displace private new construction. This follows analysis from Murray (1983) which analysed the impact of public housing on housing supply and found that public housing increases the housing stock; three-quarters of public housing units represented additions to the stock while one-quarter displaced private construction.

Williams and Boyle (2012) provide important conclusions in their analysis of the tax incentives introduced in Ireland in the period 1986 to 2011. They recommend that greater care must be taken with regard to the power afforded to vested interests that vigorously advocate for and benefit from interventions remaining in place long after they are required. This falls in line with the recommendations made in the SCSI report of better cost-benefit analysis prior to the introduction, and during the lifetime, of any tax incentive.

Infrastructure and Access to Development Finance

Although Mayer and Somerville (2000b) determine that development fees have a relatively small impact on new construction they do find that regulations which lengthen the development process can have significant effects. It is therefore important that governments make appropriate and deliberate decisions when

choosing what regulations and levies should be introduced to increase housing supply.

A recent report from the SCSI (2015) concluded that despite reductions across the four local authorities, development contributions are still a major obstacle to development. It notes that compared to the SCSI Construction Tender Price Index, which is currently approximately one-third lower than at the peak, development contributions have yet to to fall by the same amount. Similar to the UK experience the requirement to fund infrastructure in advance of the development being completed is considered one of the main reasons for the delay in new housing coming on the market. The UK have introduced a number of schemes to help finance almost finished developments.

In the UK the Department for Community and Local Government (DCLG) and the Homes and Communities Agency, for example, have introduced a £525 million Builders' Finance Fund to help reignite and boost housing developments of between 15 and 250 units. One of the main objectives of this plan is to help finish stalled but viable sites as well as accelerating fundamentally viable housing schemes. The Fund was introduced in early 2014 and is due to deliver approximately 13,000 new homes in total.

On a greater scale a £1 billion Large Site Infrastructure Fund has been introduced to bring forward larger scale housing projects. This involves a program of support over a six-year period designed to address barriers and help accelerate and unlock housing developments of at least 1,500 housing units that have slowed down or stalled completely. In total it is envisioned that upwards of 200,000 new homes will become available over the six-year period due to this fund.

Another policy innovation introduced in the UK, the Revolving Infrastructure Fund (RIF), acts as a funding mechanism for infrastructure in advance of developments being completed. This is an issue in many countries with local authorities in Germany and Sweden (Hüfner and Lundsgaard (2007) for example slow to sanction land release for owner occupation, due to the large infrastructure costs associated with such expansions. The RIF in the UK aims to increase housing growth by delivering on the infrastructure required to unlock potential developments. The fund comprises two elements, an investment phase which provides cash to pay for the key items of physical infrastructure and a repayment phase with receipts coming back to the RIF. Once the RIF has generated sufficient receipts it is then able to reinvest in other projects and so is neither a grant nor a subsidy.

In spite of the financial support the UK government is offering through loans and guarantees in excess of £10 billion, housing supply is still seriously lagging behind what is required. Measures included in the government strategy 'Laying the Foundations', such as the New Homes Bonus and the stimulus packages, which were augmented in the Budget for 2014, have so far had little impact on new housing supply.

In 2013 the National Audit Office completed a report on the New Homes Bonus, assessing whether the DCLG was meeting its objectives of incentivising local authorities to encourage the development of more homes. In general the report concluded that the estimates provided by the DCLG were 'unreliable'. In the report they note that the Department estimated that the Bonus would increase housing supply by 8 to 13 per cent over its first ten years, equivalent to around 140,000 additional homes. However significant technical issues with the DCLG methodology were noted by the National Audit Office which, it is anticipated, will further hamper housing supply in the UK market.

In Ireland, the recent Construction 2020 report (2015) from the Department of Finance touched on the difficulties encountered by smaller construction firms in raising finance. One of the key findings of an initial report which assessed the availability of senior debt financing was that up to 65 per cent of development costs (on viable projects) are provided by banks. The issue then arises of how firms, in particular smaller firms, finance the remaining 35 per cent of the cost required. Construction 2020 highlights the fact that firms may not be large enough or sophisticated enough to attract investment from larger private equity investors.

In an attempt to boost such viable projects, the NAMA Residential Funding Programme 2016-2020 was established with the objective of delivering 20,000 housing units in total by the end of 2020. While specific details are not currently widely available it is anticipated that €4.5 billion will be allocated to the programme. The NTMA also established the Ireland Strategic Investment Fund (ISIF) which will see €7.4 billion invested across industry sectors, regions and asset classes. A proportion of this funding will be allocated to financing infrastructure which may go some way to making commercially marginal sites viable for development.

From a US point of view, impact fees, similar to development contributions in Ireland, are defined as local charges imposed on developers to finance the provision of infrastructure. The results from Burge and Ihlanfeldt (2006), based

on a unique panel of impact fees and home completions for Florida counties, strongly contradict conventional wisdom regarding the negative effects of impact fees on housing construction. They find, for example, that the introduction of impact fees actually increases the number of completions of all sizes of homes within inner suburban areas and medium-sized and large homes within outer suburban areas. In providing some explanation for this result they hypothesise that in addition to increasing the total fees that the developer must pay, impact fees also act to increase the demand for housing, reduce project approval costs and increase the percentage of projects that receive approval from local authorities.

This study follows previous work that has found somewhat contradictory results. Bruekner (1997) for example notes that, compared to other ways of financing infrastructure, while impact fees reduce the amount of residential development, the predicted effect on land values are ambiguous. On the empirical side, Skidmore and Peddle (1998) amongst others find that residential development in many areas of the US fell substantially after the imposition of such impact fees. While the literature remains inconclusive with regard to the effect of impact fees, McFarlane (1999) points out that the way the fee is structured, for example whether it is on land, on housing, or on the value of the developed land, matters for these predicted effects.

Planning Regulations

Much comment recently has focussed on the need to undergo reform of building regulations in order to increase supply. Certain aspects of building standards and regulatory requirements have received much more attention than others and it is possible that some reform to these particular aspects, discussed in more detail below, will provide some level of stimulation to the housing supply issue in Ireland.

The Department of Environment, Community and Local Government Housing Policy Statement (2011) sets out as the overall strategic objective for the housing sector ‘to enable all households access good quality housing appropriate to household circumstances and in their particular community of choice’. Government regulation and policy interventions will aim to ensure that the housing market makes an appropriate contribution to wider economic performance.

More recently, in May 2014, strategy regarding the construction sector has been set out in the Construction 2020 initiative. The strategy aims to address issues affecting the construction and housing markets including:

- A strategic approach to the provision of housing;
- Continued improvement of the planning process;
- The availability of financing for viable and worthwhile projects;
- Tools to monitor and regulate the sector; and
- Ensuring a fit for purpose sector.

A recent Spotlight (2014) report provides a comprehensive overview of many areas of the planning system in Ireland and how some aspects may hinder supply within the market. As well as issues regarding the staffing levels at An Bord Pleanála, which Spotlight (2014) claims is impacting the speed at which applications could be dealt with, the report also addresses the lack of planning compliance regulation which is having a direct impact on housing supply. Currently there is no statutory timeframe for the planning authority to make a decision on compliance submissions made by an applicant. The report goes on to state that 'this can lead to a delay in the progression of developments, lack of clarity for developers, and in some cases non-compliant developments'. The provision of a statutory timeline in the Planning Regulations regarding compliance may help to prevent extended delays in the commencement of developments.

A second strand of the *Urban Regeneration and Housing Act, 2015* focuses on Part V of the *Planning and Development Act, 2000* (commonly known as 'Part V'). Under this new Housing Act, developers will now be required to reserve up to 10 per cent of a housing development – on developments of nine or more houses – for social housing. This compares to a requirement of 20 per cent in the previous 2000 Act. It is anticipated that this reform will boost housing development and ease the existing housing shortage. The SCSI believes that this expectation is somewhat simplistic. Their 2015 report highlights the many issues, such as development contribution, infrastructure requirements and access to funding, which the SCSI believe, collectively, are restricting supply. Reform to Part V alone will do little to kick-start construction of residential housing.

The Spotlight (2014) report provides some insight into the inefficiencies of Part V in recent years. It notes that in the period from 2002 to 2011, Part V has delivered 19,245 social housing units. At 4.8 per cent of all housing units delivered in this period, it is far below the anticipated 15 per cent set out in the Planning and Development Act 2000. While the report indicates that Part V has

provided a net benefit to the Exchequer a further report from PII (2014) suggests that very little revenue will be generated from the tax in the coming years due to the fact that new developments are likely to be much smaller in comparison to those completed in the recent past.

The 2004 report from the NESC provides an overview of the guidelines set out by the All Party Oireachtas Committee on the Constitutions (APOCC) which suggests that mechanisms should be put in place to control the price of development land coming to the market. Active land management, primarily used to develop social housing, has been a long tradition in Sweden. This Swedish system of land intervention is associated with a distinctive pattern of housing provision with the non-profit sector (public and private) responsible for over 50 per cent of new completions. When comparing the housing market in high-growth regions of Sweden, Britain and France, NESC (2004) found that Sweden has the highest level of productive efficiency and the lowest level of uncertainty for builders. Similarly in the Netherlands there was a long practice, for many decades, of local authorities dominating the development of land for new construction of social housing.

The housing issues that have arisen in Sweden in the past number of years have been linked to the fact that the current supply of private housing is not located where demand requires. One challenge therefore, as outlined by Hüfner and Lundsgaard (2007), is to better match supply with demand. An adequate supply response to growing demand is further hampered by a planning system that lacks incentives and a construction sector with one of the highest costs in Europe due to weak competition. The issue of cumbersome planning regulations and few incentives for municipalities to issue more land has also been noted as a problem in the Swedish market.

In addition, Konkurrensverket (2006) outlines the numerous problems with the planning process in Sweden in some detail. It is noted that municipalities play an essential role in the building process. Prior to granting a building license, a municipality must set up a general plan (designating residential, commercial and industrial areas) and a detailed plan (defining the type of building). The process of developing or changing a detailed plan can be long and tedious. In addition, appealing against detailed building plans can take up to three and a half years and thus makes a swift supply response to changes in demand quite difficult (McKinsey, 2006). Similarly, there is a severe lack of supply in economically developed regions of the US which is further constrained by the amount of land on which housebuilding is permitted and the time it takes – usually years – for developments to be processed through local planning (Policy Exchange (2013).

Sen (1986) noted that the approval process for land conversion and subdivision can take two to seven years and is fraught with uncertainty. In most states, from 15 to 20 separate government departments were involved in the approval of plans and specifications, adding another two to five years to project completion. A simple test of how well the housing market works in the aggregate is whether increases in effective demand are translated into increases in supply of housing or increase in the price of housing.

The vast majority of the literature on land-use regulation concludes that land regulations act to restrict the supply of housing and new construction. Much of the literature in this area however is focused on the United States. Ihlanfeldt (2007) for example, looks at the effects of restrictiveness on more than a hundred Florida cities and finds that greater regulation raises house prices while Glaeser and Gyourko (2005) find that, in unregulated cities, house prices are close to construction costs but in heavily controlled areas prices are well above these costs.

Quigley and Raphael (2005) find that the responsiveness of the housing stock via new construction is weaker in more regulated cities, relative to less regulated cities. Moreover, the difference in responsiveness is greatest for the supply of multi-family housing units, the source of supply that is most frequently the target of regulation. Glaeser et al. (2008) and Goodman and Thibodeau (2008) both find that price bubbles are more prevalent where the price elasticity of supply is low, while Mayer and Somerville (2000b) find that across 44 US metropolitan areas between 1985 and 1996, excessive land-use regulation could lower construction by up to 45 per cent. They also find that planning delays, through land-use and planning regulations are more important to developers than impact fees.

Mayer and Somerville (2000a) characterise regulations as adding explicit costs, uncertainty or delays to the development process and note that theory indicates that regulations such as zoning, growth controls, and development fees affect housing market outcomes both by constraining supply and increasing demand. Nearly all of the existing empirical work has explored the impact of regulation on house prices with the bulk of the papers finding that increased local regulation leads to higher house prices. To date it appears that the nearly exclusive focus on prices is problematic because difficulties then arise in determining whether higher price increases are due to higher demand or lower supply.

Perhaps surprisingly, Gyourko and Molloy (2014) find that regulation in the US appears to be the single most important influence on the supply of homes while

labour and material costs do not appear to serve as a primary constraint on residential development. Looking at house prices and construction costs over the past 30 years they conclude that the growing wedge between the two illustrates that the price of land has been trending upward over time. They also note that research on this topic has been hampered by a lack of direct evidence on regulation. For example, it is exceptionally difficult to collect accurate data on the wide variety of regulation in place, as well as the problems associated when trying to compare the stringency of one type of regulation with another. Empirically, Malpezzi (1996) finds, in a study of 56 metropolitan areas in the US, increasing the level of regulation from its average by one standard deviation is associated with 22 per cent higher house prices and 11 per cent lower levels of construction.

Malpezzi and Mayo (1997) analyse the market in Malaysia and note that relative to the US, the public sector has a considerable presence in the housing market. During the 1980s the public sector was responsible for 20-35 per cent of all new units constructed. They highlight five key interventions which have influenced the housing price level either directly, by increasing construction standards and costs, or indirectly, by increasing developers' risk. Some of these interventions include the increasing role of the public sector in housing production, land use and infrastructures standards, and lengthy housing construction approval procedures.

The Special Low Cost Housing Program (SLCHP) for example was undertaken in 1986 in response to the cyclical downturn in Malaysia's economy and in the construction industry in particular. It had two objectives: to increase the supply of low- and moderate-income housing, and to stimulate the economy through linkage effects. The main supply-side incentives in the programme were reduced infrastructure standards and speedier approval for land conversions and other regulatory matters.

The most serious problem with implementing the SLCHP included lack of demand due to inappropriate pricing, poor choice of location and designs by developers, and administrative constraints. The desire to reduce costs by choosing location with cheap land prices frequently led to producing houses far from existing employment and services, and which, as a result, sold slowly. The analysis also notes the lengthy process that developers must follow to secure approval of housing projects.

Conclusion

This examination of the existing international and domestic housing policies highlights a myriad of governmental approaches used to tackle the issue of housing supply and potential lack thereof. It is true that in some circumstances the lag in new residential construction is linked to non-policy constraints such as geographical conditions. However, in many circumstances, as the literature identifies, government policy plays a strong role in housing supply responsiveness.

This paper highlights some of the main aspects of government policy that act to influence housing supply. In particular, three policies emerge that appear to play an important role in acting as a constraint on housing supply. International evidence shows that strict planning regulations can have a greater impact on housing development than infrastructural costs. Andrews et al. (2011), for example, identify lower supply elasticities in countries with strict land-use and planning regulations. This is considered to be especially the case in countries where it takes a relatively long period of time to acquire a building permit.

Substantial infrastructural costs also play an important role in either intensifying or alleviating supply issues. As the recent report from SCSI (2015) established, development contributions are still a major obstacle to development in Ireland despite reductions across the four main local authorities. Evidence from the UK indicates that government grants used to subsidise stalled developments may provide some assistance in alleviating supply-side pressures. However, these schemes can be challenging to implement effectively and the success of such schemes is notoriously difficult to quantify.

Finally, the study also finds that inappropriate taxation can result in serious consequences when it comes to residential construction. Several reports in the mid-2000s investigated the taxation policy mix in Ireland in the lead up to the housing construction boom. Indecon (2005) in particular recommended that the introduction of any new incentives should be informed by a formal assessment of the likely cost-benefit appraisal. Evidence from countries such as Denmark show that the introduction of a land tax that increases in line with house/land prices is shown to act as an incentive to sell/use underdeveloped or vacant land in periods of increased demand.

There remains much scope, from an Irish point of view in particular, for government policy reform to encourage new housing developments that will meet demand. A recent study from Duffy et al. (2014), based on likely future demographic trends, concludes that 25,000 housing units per annum are required

over the next 15 years to meet the underlying demand in the Irish market. As it stands, Ireland is in a similar situation to the UK with completions well under half of what is required annually. Therefore, bridging the gap between the actual and desired housing stock, in an efficient and timely manner, requires a careful and prudent policy mix.

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