New supply and housing price behaviour: A short revision of the empirical evidence

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Abstract: House-building has been very intense in some European countries throughout the last 15 years but not in others. It has generated an expansion in the residential stock that has been explained as the result of some demand forces playing at the same time and boosting residential market mechanisms during this period. Although demand pressures have been similar across Europe, the new supply construction has reacted with distinct strength depending on the economies. This paper reviews the literature seeking for reasons to analyze the different reactions and the implication on house prices growth of development sector. It mainly classifies the literature between both the group that suggests stable supply elasticities in the short-long term and those sustaining that elasticities change dramatically, reflecting the developers reaction to market innovations. The differences in new housing supply responses across European countries remain a wide area for housing researchers to explain how housing prices react by region.

Key words: new housing supply, supply elasticity, housing prices

1. Introduction

During a decade before the credit crunch, housing prices in many developed countries did growth intensively. The expansion they have gone through has been one of the greatest in Europe (Ball, 2004) and accelerated since the late 1990s until it reached level which multiplies several times those existing when the Single Market was created. The responsibility of this behaviour has been analyzed mainly from the demand side, focusing on the socio-economic changes' impact on the residential market in many of the countries but it was in the United Kingdom when supply responses in the market started to be analyzed as responsible on house price appreciation. The situation in the United Kingdom reflected the image of a residential market influenced by similar demand impacts as in other European countries like Spain or Ireland, but with a very reduced new housing supply. The difference in the response to market signals did surprise both the British govern-

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ment and the analysts, who are observing the other cases in order to understand the keys to the supply's quick response.

This paper seeks to provide a literature review of how prices affect the supply of new houses and the responses degree measured by empirical new supply elasticities. The supply elasticity is a key to understand price growth due to larger value of the elasticity parameter, which means strong responses on new construction when price changes, and then the appearance of new supply flows helps to mitigate the house price growth.

2. The theoretical view about the role of the housing supply

The concept of housing supply refers to the units included in the stock fulfilling the conditions to be demanded in the market. The theory distinguishes between stock, which is the total of units existing in the market, and supply flow, which is the total of units available on the market capable to satisfy the demand. This distinction is relevant, as it suggests two different analytic frameworks, the first one referring to the analysis of the volume of housing services, while the second discriminates between the market of new and existing dwellings, being the latest the common focus used to analyze the supply and its impact on prices. The total supply is generally considered to be the stable proportion of the total stock.

The existing units represent a part of the supply not well known keeping a balance with the total stock and the vacancy level (Maisel, 1963). Because of their relevance and greater volatility, new units are the most often analyzed as the main supply component. In fact, it is believed that the total supply essentially depends on the evolution of new house building as well as on the residential investment rate. Both groups are considered to be constant proportion of the yearly total stock (new dwellings reach a maximum of 3–3.5% of the stock but there is few evidence about the weight of existing units with respect to the total supply).

The fluctuations on these supposed-to-be normal levels of both components trigger and the endogenous housing market adjust mechanism, by means of which the excess of existing supply reduces the construction rate and stabilizes prices while supply restrictions push them up again. The distinction between the two effects becomes relevant because the price reached by existing units in the market will initially respond to the supply-and-demand forces today, even if the structures were built in the past at past's costs. Instead, in the new housing market, dwellings reflect land costs and more recent factors; so that the newer the dwelling, the higher the costs. In absence of demand pressure, a market in which the supply is mainly integrated by new units (or rehabilitated/ renovated ones) will present higher price levels than in the opposite case.

The supply curves are rigid in the short run as the result of the special characteristics of housing and its production process (it is a fixed commodity with a difficult and expensive provision, which requires long maturation periods [Arnott, 1987]). Jointly with lack of information and financial requirements those features make this market uncertain and supply is expected to respond slowly to market signals. This means that the supply reacts just partially when changes in the demand occur generating an asymmetric response: a positive shock on any demand component causes an upward reaction of prices in the short run meanwhile the house building cannot increase suddenly. The supply increases systematically as the starts are completed. If during this period the demand decreases, the supply cannot perform a downward fit, since dwellings

cannot be 'destroyed' or 'removed' from the market, thus generating the existence of a vacant. During a contraction period, prices do not drop while the total of vacant units' increases, since the costs incurred and the chances of a future increase in housing prices persuade owners to maintain the units and not sell underpriced. This is why the response of new housing supply is elastic in the first case but inelastic in the second one (Glaeser et al., 2005).

The interaction of demand and supply, as well as their sensitivity, is therefore a key aspect to understanding price behaviour. According to the literature, although the equilibrium does not take place in the short run because of the rigidity of the supply curve, it is afforded in the long run. It happens when the curve has acquired more flexibility so that adjustment is performed 'taking time' (DiPasquale, 1999, although this comment used to appear in nearly all other research, e.g. Meen, 2002; Topel and Rosen, 1988). This reaction with time perspective implies that the supply curve may have a degree of elasticity that adjusts the market and guides price evolution. Since they depend on both the inputs and the dimension of the construction sector, supply curves with different elasticity levels may exist in the short run from the spatial perspective. In these cases, the impact caused by any changes in the demand on prices can vary depending on this sensitivity and location; i.e. a market with a less rigid supply curve will suffer a lower impact on prices when a demand shock takes place than in the case of a market showing greater supply rigidity (Figure 1). New supply elasticity is consequently a key factor that allows us to understand one part of the evolution of prices in residential markets.

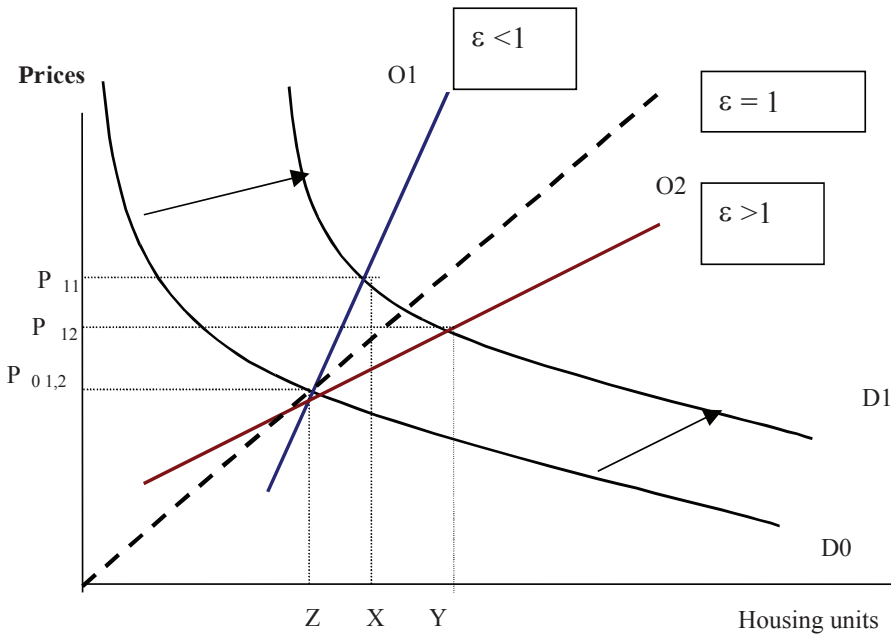

Figure 1. New supply function and price reaction

S o u r c e: (Taltavull, 2014).

Various studies have described experiences about the different supply elasticity values; and it is widely recognized that residential supply is flexible in the long run (De Leeuw and Ekanem, 1971; Olsen, 1987; Hanushek and Quigley, 1979; Meen, 2002; Blackley, 1999; Glaeser et al., 2005, amongst others), showing a slow return of prices towards the equilibrium. It is generally agreed that short-run supply elasticities are smaller than long-run ones because some time is required for building (Quigley, 1997; Topel and Rosen, 1988; for the US: Malpezzi and MacLennan, 2001; Dipasquale and Wheaton, 1994; Goodman, 2005; Malpezzi and Vandell, 2002, amongst others). Nonetheless, the international experience shows that, although the US research does contrast the presence of elastic values in the long-run new supply, this may not be generalized in other world regions experiences. The available studies about Europe give models results showing reduced supply elasticities and values near to zero. It is the case of the UK and Spain during the last decade (Barker Review, 2003; Pryce, 1999; Malpezzi and Maclennan, 2001; Bramley, 2003; Taltavull, 2014, see Table 1), which means a weak answer from the supply side to a demand impulse resulting in a strong rise on housing prices. The restrictions in the construction sector (because, for instance, an inadequate size on the industry, a restrictive permission system and/ or a lack of land) make it also impossible for new units to increase in the medium term, which generates still stronger growths on prices (Barker Review, 2003), giving low values for the elasticity.

Table 1. Supply elasticities in different countries

Type of housing unit	Country	Analysis area	Estimate period	Value	Author
stock	United Kingdom	aggregated	1955–1972	0.5–1	Whitehead, 1974
stock	United Kingdom	aggregated	1955–1976	0.3 (cp)–0.6 (l p)	Mayes, 1979
stock	United Kingdom	districts	1988	0.8	Bramley, 1996
stock	Scotland	city	1998, 1992	0.6 (boom)–1 (crisis)	Pryce, 1999
stock	United Kingdom	aggregated	1976–1999	0.5	Swank et al., 2002
stock	England	aggregated	1973–2002	0.3	
New dwellings	United Kingdom	aggregated		0.5	Mayo & Sheppard, 1991
New dwellings	Germany			2.1	Mayo & Sheppard, 1991
New dwellings	France			1.1	Mayo & Sheppard, 1991
New dwellings	Netherlands			0.3	Mayo & Sheppard, 1991
New dwellings	Denmark			0.7	Mayo & Sheppard, 1991
New dwellings	United States			1.4	Mayo & Sheppard, 1991
New dwellings	United Kingdom	levels		0.36–0.38	Bramley, 2003
		1st. diff		0.585	
New dwellings	Spain	levels		0.56	Taltavull, 2014

S o u r c e: (Bramley, 2003, p. 211; Taltavull, 2014).

2.1. A problem measuring the supply curve and elasticity of housing

As it is reflected in Table 1, most of supply elasticity estimations are different. Most of the differences come from the way as the supply function is defined. The theory has largely related the supply to determinants of the production function. This link has generated many of the difficulties in calculating and defining a market supply function (Hanusheck and Quigley, 1979), first, because production (starts) is not the only source of supply, second, the unexistence of data available to observe the whole supply as a flow, both the existing ones and the new one (Goodman et al., 2005), and third, the fact that the supply function is local and specific to different regions, in many cases metropolitan areas[1] (Glaeser et al., 2005; DiPasquale, 1999). This has made that research use, indistinctively, the housing stock as definition of the supply (DiPasquale and Wheaton, 1994; Whitehead, 2004; Mayer and Somerville, 2000; Meen, 2001) or using the new units that arrive at the market (most of the research share this focus, e.g. Mason, 1977; Malpezzi and Maclennan, 2001; Meen et al, 1998; but Bramley, 2003, used completed units though). This multiplicity of measures has produced that the elasticity obtained varies depending on which one has been chosen.

Recently, some research have added complexity contrasting how the supply elasticities are estimated as time is changing, reflecting swing-curves of supply which used to change their responses depending on the different moments of cycle, i.e. defining supply functions as curves which 'move' over time (Pryce, 1999; Bramley, 1993, 2003; Malpezzi and Vandel, 2002).

Other researches maintain that the difficulty to measure the supply comes from the price that is not standard, and quantity exists in the market because each unit varies in terms of quality and dimensions. The housing supply is also the result of a complex decision-making process in which both builders and homeowners intervene, and there is very small evidence about how each part reacts, since the observation unit hardly ever refers to the supply in statistics (Hanusheck and Quigley, 1979) and could exacerbate in presence of shocks (Glaeser et al., 2005; Taltavull, 2014).

DiPasquale (1999) summarized the problems related to the estimation of housing supply into two groups: The first one is the lack of suitable databases due to the information-related problems mentioned above, which is why analysts must face problems linked to quality in the available data and have decided to use basically aggregated information instead of microdata. This use makes lose perspective of the local market where the market balance takes place (Malpezzi and Vandel, 2002; Goodman et al., 2005). The second group of reasons is a deficit in the supply explanatory theory, as the foundations are not fully settled yet. There seems to be growing evidence that some of the generally recognized principles may not be so true. For instance, there are increasing evidence about how supply is not fixed since it is admitted that functions are elastic in the long run (Meen, 2001). That elasticities change in time (Pryce, 1999; Goodman, 2005) and also in space as a result of the action of territorial factors

[1] There are in fact works which estimated supply elasticity at an aggregate national level and by regions obtaining very different elasticity results. For example, Mayer and Somerville, 2000, obtained an elasticity for new dwellings that is overestimated with respect to the results of the calculation carried out in different local areas and underestimates the time required to respond to a price shock.

which affect markets locally, like the climate (Fergus, 1999), the situation (Goodman and Thibodeau, 1998) or the impact of economic shocks in the decision process (Taltavull, 2014).

Finally, there is also an agreement on the existence of different market conditions for this sector, on a quasi-monopoly or monopolistic competition basis (Green and Malpezzi, 2003), which determines the degree of the supply reaction. Supply curve becomes inelastic because of the inflexibility on the supply side sector. It comes from its inputs (land, materials, labour) or due to the effect of some market power (concentrated land ownership, reduced number of building firms, land uses under control, restrictive permit system…) as well as from the control that developers can apply on the production process with the purpose of adapting the supply to changes in the cycle (Coulson, 1999). All these, along with the asymmetry in the residential market adjustment system, generates disparate, tangled-in-time supply responses (Goodman, 2005; Pryce, 1999) with greater dynamism when positive shocks occur than negative ones (Glaeser et al., 2005; Taltavull 2014).

To this set of interactions, the impact that the housing policy has on the supply should be added (Murray, 1999; Malpezzi and Vandel, 2002). The evidence available shows the different effects that some of such type of measures applied have on the market. It is widely accepted that, no matter how apparently small the policy actions are and regardless of the measures applied and of their intensity, they cause an overall impact over the market. Their impact will depend on price and income elasticities on demand and supply, and they can provoke relevant changes in the configuration of the area where public dwellings are built (Malpezzi and Vandel, 2002; Whitehead, 2003).

3. Conclusions

Housing supply behaviour is hard to analyze. Recent literature has been showing how some principles can not always be true, especially about how the supply is fixed in the short run or elastic in long term.

The empirical existing evidence support, the elasticities vary in time and space, thus reflecting the different economic and local conditions present in the housing markets. The value of new housing responses to price changes could serve to evaluate the expected impact of any economic shock overall economy. It could also allow to classify housing markets as those with less out-market pressures (more efficient ones) and those where the new supply is determined by other omitted variables which could be, for instance, more intensive housing policy, land ownership control or restrictions in permission system.

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Wpływ podaży na kształtowanie się cen nowych mieszkań. Wyniki badań empirycznych

Abstrakt: Przez ostatnie piętnaście lat budownictwo mieszkaniowe w niektórych krajach europejskich rozwijało się bardzo intensywne, podczas gdy w innych nie. Przyczyniło się to do wzrostu zasobu mieszkaniowego, co wyjaśniono jako skutek popytu, odgrywającego w tym okresie znaczącą rolę w mechanizmach rynku mieszkaniowego oraz jednocześnie je pobudzającego. Chociaż siła popytu jest podobna w całej Europie, nowa struktura podaży zareagowała ze zdecydowanym natężeniem w zależności od ekonomii da-

nego kraju. Niniejsza praca dokonuje przeglądu literatury, poszukując motywów różnych reakcji na wzrost cen domów w sektorze developerskim oraz konsekwencji tegoż wzrostu. Literaturę można podzielić na dwie grupy: tych autorów, którzy sugerują stabilną elastyczność podaży w krótkim / długim okresie czasu, oraz tych, którzy utrzymują, że elastyczność zmienia się dramatycznie, odzwierciedlając reakcję deweloperów na innowacje rynkowe. Różnice w reakcjach na podaż nowych mieszkań w krajach europejskich pozostają szerokim obszarem dla badaczy rynku mieszkaniowego chcących wyjaśnić, jak ceny mieszkań zmieniają się w zależności od regionu.

Słowa kluczowe: podaż nowych mieszkań, elastyczność podaży, ceny mieszkań