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THE EVOLUTION OF THE HOUSING STOCK IN MALTA

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BOX 3: THE EVOLUTION OF THE HOUSING STOCK IN MALTA[1]

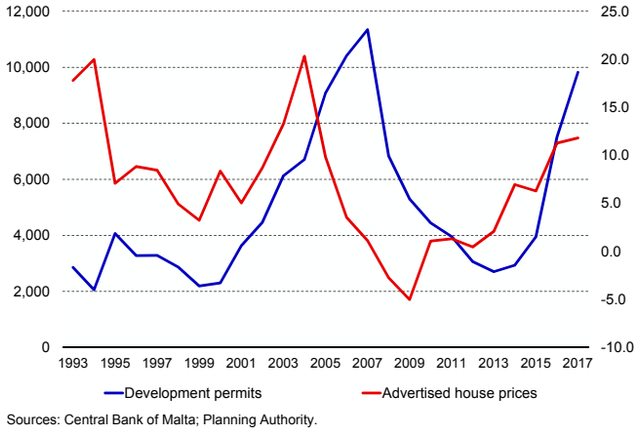
An analysis of the housing market focuses on both demand and supply-side factors. On the supply side, measures usually refer to development permits, housing investment and the housing stock. Fluctuations in housing investment influence the cyclical developments of the economy while, at the same time, developments in the housing market may affect the stability of the financial system. Planning policies supporting sustainable housing supply contribute to long-run growth. When shaping such strategies, policymakers require a detailed and up-to-date picture of the situation. Official data on the housing stock in Malta are only available as part of the population census, thus only offering snapshots, typically over ten-year intervals. The most recent census was conducted in 2011, and in that year the total number of housing units stood at 223,850.[2]

Since the publication of the census, the property market has witnessed a strong increase in demand that exerted upward pressure on house prices. However, the extent to which supply has responded to this activity is less known. This article attempts to shed light on the evolution of the housing stock over time by using more timely information on development permits. A caveat is in order. The estimates of the housing stock, which comprise both occupied and vacant units, are based on a number of assumptions and are therefore surrounded by a degree of uncertainty. In the absence of official data, these estimates are only intended to provide an indication of movements in the housing stock.

Constructing the housing stock series

The stock of housing reflects accumulation of net housing investment. The latter is in part determined by the number of development permits issued by the Planning Authority. Chart 1 shows the number of permits for dwellings issued in Malta since 1993, and property price growth based on advertised prices. The chart illustrates strong pro-cyclicality, with the number of approved applications rising in buoyant housing market conditions. Construction tends to react to an increase in demand with

Chart 1
DEVELOPMENT PERMITS FOR DWELLINGS AND ADVERTISED PROPERTY PRICE GROWTH
(number of units and annual percentage growth)



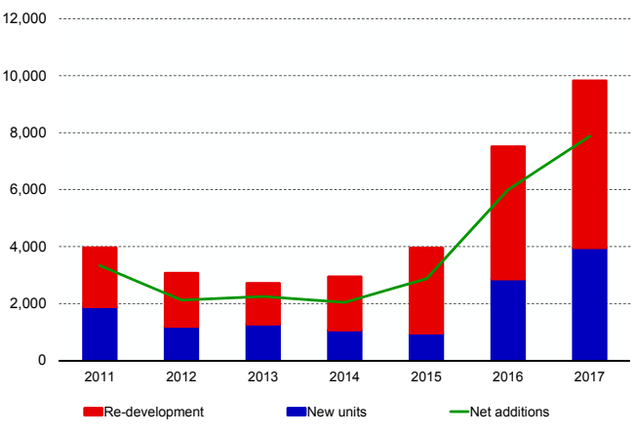
Sources: Central Bank of Malta; Planning Authority.

[1] Prepared by William Gatt, Principal Research Economist within the Research Department of the Central Bank of Malta, and Ph.D. Candidate at the University of Nottingham. He would like to thank Mr Alexander Demarco, Dr Aaron G. Grech, Mr Brian Micallef and Mr Noel Rapa for helpful comments. The views expressed in this article are the author's own and do not reflect the views of the Central Bank of Malta. Any errors are the responsibility of the author.

[2] See "*Census of Population and Housing 2011*", National Statistics Office, 2014, Table 85.

a lag. Applications for the development of apartments account for most of these development permits. Since 2003, around 82.5% of these permits were for the construction of apartments, with another 10% for maisonettes and the rest for other types of properties.

Chart 2
PERMITS BY TYPE OF DEVELOPMENT
(number of units)



Sources: Author's calculations; Planning Authority.

The strong pick-up in permit approvals since 2013 has important implications for the dynamics of the housing stock. Data obtained from the Planning Authority show that these permits can be broken down into applications for conversions and re-development of existing units, and the development of new units. In the case of conversions and re-development, what matters for the housing stock is the net gain in units. An example illustrates this point. Re-development might entail the addition of three units in an area previously occupied by one. In this case, the permit will be for the development of four units, but the net increase in the housing stock is effectively by three. Chart 2 shows the total number of permits since 2011, decomposed into conversions and re-developments and new units, as well as the net increase in units. The latter is lower than the total number of permits due to the replacement of existing units.

As hinted above, the stock of housing at a point in time can be presented mathematically by:

$$Housing\ Stock_t = Housing\ Stock_{t-1} + Additions_t - Replacements_t$$

that is, the supply of housing at a point in time is the net addition of dwellings over a period to the existing stock in the previous period. The analysis uses the 1985 census as the starting point for the housing stock estimate. Since then, there are three other census data points, namely in 1995, 2005 and 2011. Data on net additions are not available for most of the sample period and so proxies have to be used. Development permits were first issued in 1993, a year after the Development Planning Act (1992) established the Planning Authority. Hence, information on development activity in terms of yearly permits is not available prior to this date.

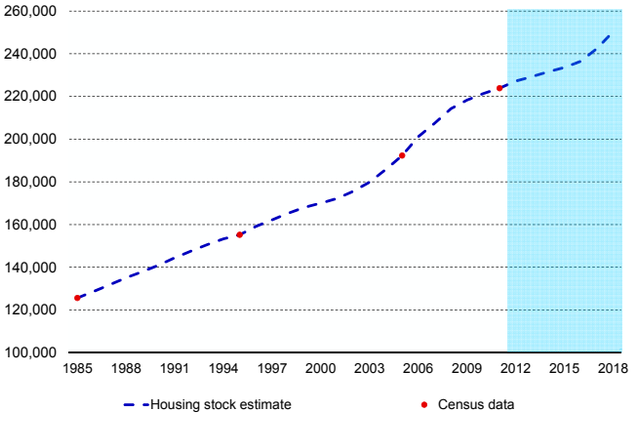
To overcome this limitation, an econometric model was used to capture the link between development permits and dwelling investment. The model was estimated over the period 1993-2017 and the estimated coefficients were used to build a synthetic series of development permits for the period 1985-1992, utilising the information on dwelling investment.

This approach provided a time series for development permits which, when combined with census data, yields an estimate of the housing stock. The number of permits approved does not equate one-to-one to the number of net new units added to the stock of housing. Therefore, when using permits as a proxy, one must try to limit the possibility that units are double-counted. The computation of the housing stock uses the following equation for supply accumulation:

$$Housing\ Stock_t = (1-\delta)Housing\ Stock_{t-1} + \gamma_t Permits_{t-1}$$

where δ and γ are the depreciation and utilization rates, respectively. These two parameters collectively capture the fact that permits do not translate to one-to-one additions to the housing stock, as discussed above.[3] The depreciation rate is fixed to a small number throughout the period, but the utilization rate is varied over time such that it guarantees that the estimated housing stock coincides with actual census data whenever this is available. It is assumed that approved development takes an average of one year to be completed, which is why permits are lagged by one period in the above equation. While the utilization rate (γ) is varied objectively to splice the housing stock series between any two census points, it is not clear how it should be calibrated beyond 2011, since there is no other end point which acts as a target. Instead of maintaining the last value used for after 2011, data on net additions as shown in Chart 2 were used to extend the housing stock up to 2018.[4] The estimated housing stock series is shown in Chart 3, in which the shading from 2011 onwards highlights accumulation through the use of net additions, rather than utilized permits.

Chart 3
THE HOUSING STOCK
(number of units)



Sources: NSO; author's calculations.

The measure of housing supply proposed shown in Chart 3 refers to the total housing stock. This measure also includes vacant properties, which, according to the 2011 census, consists of

[3] The depreciation rate can be thought of as accounting for the natural destruction of housing units due to low maintenance or due to the dwellings becoming uninhabited.

[4] Data on net additions to stock are only available from 2000 onwards. One could replace the approximation based on permits (and the corresponding depreciation and utilization rates) with the accumulation of net additional stock (also lagged by one year) to the stock in the previous period from 2001 onwards. However, this method results in the estimated housing stock undershooting the 2005 census data by 1,809 units and overshooting that of 2011 by 8,308 units. Overshooting could be the result of approved projects not being finished after a year, or not at all. It may also be due to the constant one year 'time to build' assumption that is used, but changing the lag on net additions between zero and up to four years produces similar results. Using net additions only from 2006 on, that is, building on the actual 2005 census point, also leads to a large overestimation of 10,117 units in 2011. The 'time to build' may therefore vary for different units, but it is hard to objectively calibrate a time-varying lag on net additions to reflect this. Undershooting the official count might also be due to the timing assumption but could also indicate the unsanctioned development of dwellings which are subsequently captured in a census.

Table 1
STOCK OF VACANT PROPERTY

Number of units

	Seasonal or secondary use[1]	*% of total*	Completely vacant	*% of total*	Total
1985	-		-		24,065
1995	12,967	36.3	22,756	63.7	35,723
2005	10,028	18.9	43,108	81.1	53,136
2011	29,848	42.0	41,232	58.0	71,080

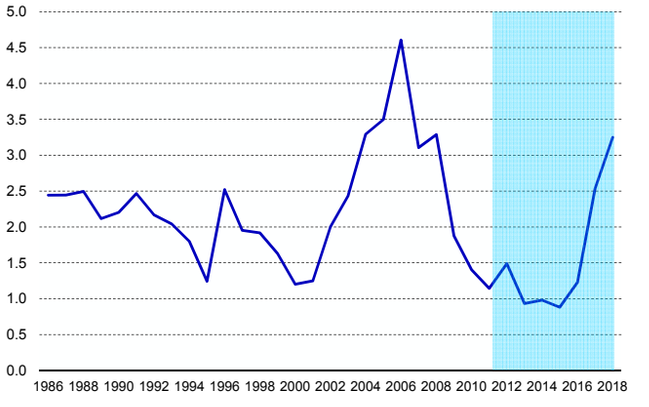
[1] Classified as 'Summer Residence' and 'Holiday dwelling' in the 1995 and 2005 censuses, respectively. Figures may therefore not be strictly comparable with those for 2011. The number of 'Holiday dwellings' in the 2011 Census stood at 12,450.

Source: NSO.

71,000 units, of which 42% consisted of seasonal or secondary residences (see Table 1). The rest mainly includes properties that are in a dilapidated or inhabitable state or where ownership is contested. Data limitations hamper the calculation of a measure of the housing stock that excludes vacant properties. Definitions have also changed over the years. For instance, in the 1995 and 2005 censuses, vacant property was reported as either a summer or holiday residence or as completely vacant, whereas in the 2011 census holiday dwellings were a subset of property classified as being for seasonal or secondary use.[5] Little is known on the status of these units today, yet a booming property market with rising rents and a number of incentives introduced by government to rehabilitate buildings in urban core areas have introduced strong incentives on owners to put such properties on the market.

Our estimates suggest that the supply of housing grew at an average rate of about 2% each year between 1985 and 2000, but experienced stronger growth at about 2.9% between 2001 and 2007. Thereafter, the supply of housing decelerated sharply following the sharp reduction in development permits and dwelling investment after the financial crisis of 2008/09. In recent years net additions more than doubled (see Chart 2), implying a strong subsequent pick-up in the housing stock. As shown in Chart 4, supply reacted

Chart 4
THE DYNAMICS OF THE HOUSING STOCK
(annual growth in percentage points)



Source: Author's calculations.

[5] Holiday dwellings in the 2011 census are defined as temporary accommodation used at least for a month in a year for recreational purposes. Therefore the same dwelling may have been used by more than one respondent, introducing an element of double-counting. On the other hand, dwellings which were rented out to other persons were not counted as holiday dwellings in the 2005 census.

with a lag to the rise in the demand, since growth in the housing stock accelerated only after 2015. Although growth in 2018 was high, it was still below the highest growth rate experienced in the pre-crisis period. The estimated housing stock stood at around 250,000 units in 2018, doubling in size since 1985.

The housing stock estimates derived in this article have recently been used by Gatt, Micallef and Rapa (2018), who build a macro-econometric model of the Maltese housing market.[6] They find that dwelling investment tended to move positively with house prices in the long run, implying that supply responded to increased activity, although this elasticity is less than unity. House prices were found to be negatively related to housing supply per capita, with an estimated elasticity of -1.3 over the period 1980-2017. In other words, a 1% increase in the housing stock per capita lowers real house prices by 1.30% in the long run, holding the other variables in the model constant. However, the coefficient that captures the supply elasticity has not been stable over time. Using rolling regression estimates, the authors show that the coefficient on per capita housing stock in the house price equation turned positive in the early phase of the housing boom of the mid-2000s. This counter-intuitive result can be explained by the possibility of speculation and anticipation of strong demand. The coefficient returned negative following the correction in the late 2000s, although, in recent years, the rolling coefficient has not been statistically significant at conventional levels.[7] This finding is especially important for financial stability purposes, which indicates that the current period is different from the pre-crisis housing boom.

The same authors also find that including housing supply in the analysis of house price valuation matters for quantifying the extent to which house prices are misaligned with fundamentals. They use the model to measure house price disequilibrium and compare it to two other estimates, based on different methodologies.[8] While the underlying trends in misalignment across the three estimates move in tandem, on average house prices were less undervalued during 2010-2016 when taking into account supply.

Conclusion

To conclude, the estimated measure of housing stock documented in this Box introduces an indicator to gauge developments in the supply side of the property market. This measure can be used to complement already available demand indicators, such as the increases in household income, interest rates and credit, and has been found to improve the fit of an econometric model for house prices, thus helping to complement the toolkit used to assess house price valuations and affordability.

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[6] See Gatt, W., Micallef, B. and Rapa, N. (2018), "A macro-econometric model of the housing market in Malta," in *Research Bulletin* 2018, Central Bank of Malta.

[7] The variable used in the model is housing stock per capita. The point estimate of the coefficient as at 2017 is still negative at -2, but is imprecisely estimated with a wide two-standard error band.

[8] See Gatt, W., and Grech, O. (2016), "An assessment of the housing market in Malta," Policy Note September 2016, Central Bank of Malta, and Micallef, B. (2018), "Constructing an index to examine house price misalignment with fundamentals in Malta," *International Journal of Housing Markets and Analysis, 11(*2), pp. 315-334.