# An Assessment of the Maltese Housing Market[1]

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Policy Note
September 2016

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# Abstract

Few macroeconomic variables generate as much interest and debate as house prices. Households, firms and policymakers alike watch house prices closely because of the far-reaching implications they have on macroeconomic performance and the stability of the financial system. In recent years, house prices in Malta have risen considerably, nearly doubling between 2000 and 2015, although with a significant degree of variability. This has led to growing concerns about the possible existence of a housing bubble. This note provides an assessment of the Maltese housing market, in particular by addressing four key points of interest.

First, we outline the main developments in the housing market in recent decades and discuss the various demand and supply factors, including Government policies, that have shaped the course of house prices. Next, using both statistical and econometric techniques, we examine whether there is any misalignment in house prices and find that as at the end of 2015, house prices were not overvalued. Third, we identify trends in housing rents using data which has been made available only recently. We show that the increase in rents over the past decade has matched the rise in house prices, which further reinforces the evidence that house prices are not overvalued, but rather in line with fundamentals. Finally, simulations are conducted using STREAM, the Bank's core macro-econometric model, to quantify the macroeconomic impact of a change in house prices and identify the main channels through which such a change is transmitted to the broader economy. The results suggest that a house price shock influences the wider economy via three main channels – private consumption, housing investment and credit – and that its macroeconomic impact is limited, but this comes with important caveats.

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# Executive Summary

Few macroeconomic variables generate as much interest and debate as house prices. Households, firms and policymakers alike watch house prices closely because of the far-reaching implications they have on wealth, and thus private consumption; housing investment; and collateral, which in turn influences non-performing loans as well as banks' and borrowers' ability and willingness to lend and borrow, respectively. Developments in house prices therefore influence macroeconomic performance and the stability of the financial system.

The relevance of house prices is particularly pronounced in Malta, where the home-ownership rate stands at 80% and 41% of total credit extended by banks takes the form of mortgages.[4,5] In recent years, house prices in Malta have risen considerably. Between 2000 and 2015, house prices nearly doubled, increasing by 4.8 per cent (2.6 per cent in real terms) per annum, on average, although with a significant degree of variability.[6] House prices increased rapidly over the 2000 to 2005 period, registered modest or negative growth between 2006 and 2013, and rose considerably again in 2014 and 2015 (see figure 1). The notable rise in house prices over time has led to growing concerns about the possible existence of a housing bubble, a situation where there is a misalignment between the market price of an asset and its underlying value as determined by economic fundamentals, making the property market prone to price corrections that generate adverse macroeconomic consequences. This note examines the Maltese housing market, and in particular seeks to address the following questions:

**What were the main changes in the property market over the last decades?**
Government policy in the 1980s targeted an increase in home ownership, with numerous units and plots distributed by the Housing Authority, relieving pressure off house prices. Starting in the early 1990s, capital markets were liberalized, interest rates on mortgage credit fell and the stock of outstanding debt for house purchase increased. Activity in the property market rose on the back of rising income, and over time some households claimed title to not only a primary residence, but also a secondary, vacation residence. Anticipation of EU accession and government policies in the early to mid-2000s further stimulated the market. House prices declined in 2008 and 2009, partly correcting previous excesses. Since 2013, a number of government measures were implemented to stimulate the market, such as the reduction of stamp duty for first time buyers, the investment registration scheme of 2014 and a reform to the Capital Gains Tax, as well as tax on rental income. More recently,

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[4]  The home-ownership rate is the ratio of owner-occupied dwellings to total residential dwellings. The figure reported is that for 2014.
[5]  The figure quoted for the ratio of mortgages to total credit is that for 2015.
[6]  According to the house price data published by the Central Bank of Malta, which extend back to 2000 and are based on advertised prices.

amendments to the law, with the aim of facilitating more effective sale of inherited property, have been approved.

Traditionally, the private rental market used to be very thin. Over the years, various laws were amended, in part to rectify the restrictions of several decades before, in an effort to stimulate the efficient functioning of this market. Social and demographic changes, as well as the increasing inflows of foreign workers, have further stimulated this market. As at 2014, 80% of households owned their property, while 20% rented their accommodation, most at below market rates.

**What is the extent of misalignment in house prices?**

Misalignment is defined as a situation in which house prices drift away from their fundamental value, measured relative to other macroeconomic variables. In this paper, the rate of growth in actual house prices relative to trend growth is assessed using a mix of statistical and econometric techniques. These approaches show that house prices relative to income peaked in 2005 and, following a correction phase, reached a trough in 2012. This gap has been gradually closed by the revival of the housing market since 2013 and, according to various econometric and statistical approaches, house prices were close to equilibrium levels by the end of 2015.

**What were the main trends in the rental market?**

Rents have attracted attention recently given a cumulative increase of about 23% since 2012. This increase is not specific to any location but is rather broad-based, although different regions command substantially different rents. House prices and rents have both risen by roughly the same amount since 2006, suggesting that the recent increases in the latter were not out of line with fundamentals.

**What is the macroeconomic impact of a change in house prices in Malta?**

Simulation results for both a permanent and a temporary house price shock, generated using STREAM, the Bank's core macro-econometric model, point towards two key messages. First, in Malta, a house price shock influences the broader economy through three main channels: private consumption, housing investment and credit. Second, the macroeconomic impact of a domestic house price shock is limited, with the peak impact of the more severe permanent shock on GDP only reaching 0.22 percent deviation from baseline levels, but this is subject to important caveats.

# What were the main changes in the property market over the last decades?

In the early 1980s, the Maltese economy was still feeling the effects of the second oil price shock, registering low or negative economic growth and high unemployment. Within the context of such an environment, government policy was targeted at increasing home ownership (Demarco, 1995). Indeed, between 1980 and 1987, 9751 units and plots were provided through the Housing Authority.[7] This relieved pressure off house prices, and during most of the 1980s house prices were largely stable (Figure 1).

**Figure 1: House price index based on median advertised prices (2000 = 100)**
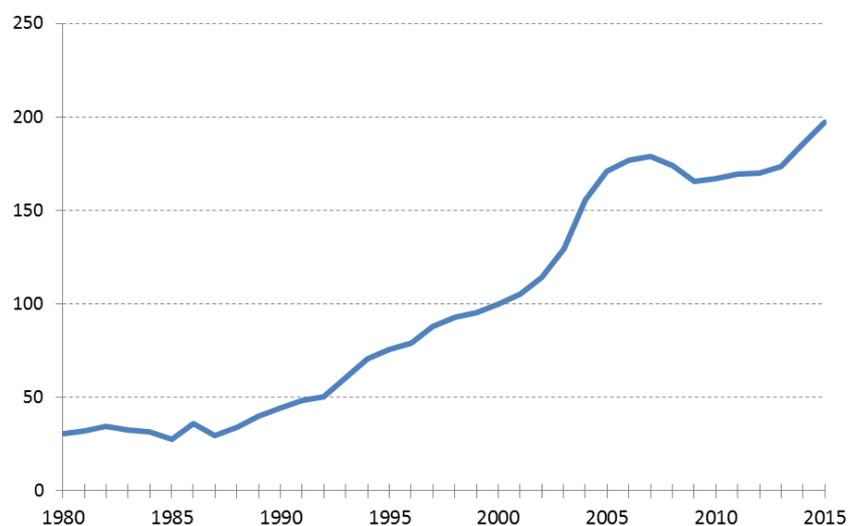


*Source: Grech (2015a) and authors' calculations*

In the late 1980s and early 1990s, government assistance fell by roughly half. Exchange controls at the time limited the number of investment options, which meant that a significant portion of savings were channelled to the housing market. These developments, coupled with high income growth, led to a surge in activity and house prices grew considerably. Following the liberalization of capital markets in the early 1990s, interest rates on housing credit fell, prompting a rise in mortgage lending and providing a further boost to the market. In fact the stock of mortgages grew from under 0.5% of GDP in 1985 to over 5.5% by 1999 (Figure 2).

The introduction of Capital Gains Tax in 1993 did little to dampen demand for property, as prices kept on rising well into the late 1990s. This could be explained by expectations of higher prices following the Development Planning Act of 1992, which may have been perceived as introducing more stringent controls on the extension of development zones, and hence a constraint on housing supply.

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[7]    Source: Planning Authority.

**Figure 2: Mortgage lending rate and the stock of housing credit**
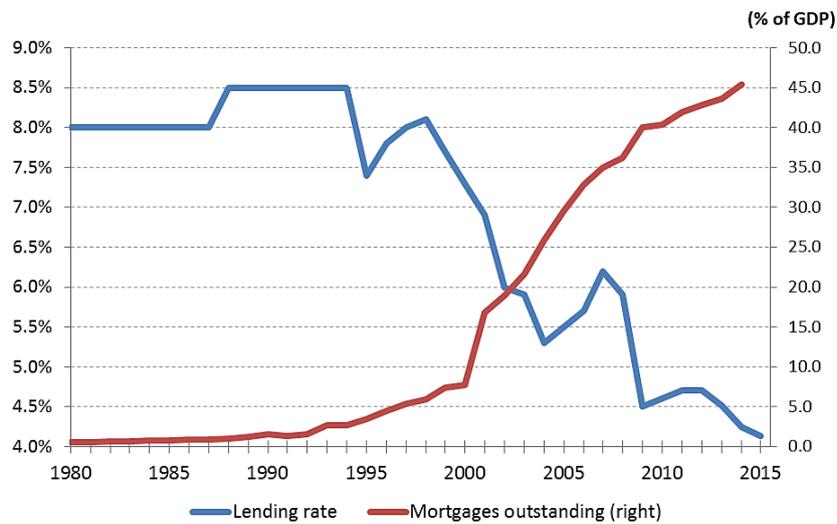


*Source: Grech (2015a)*
*Note: The series for the lending rate was extended beyond 2012 using more recent Central Bank of Malta data on (MIR) interest rates.*

EU accession in 2004 is likely to have had a positive influence on future economic prospects and hence to have driven up prices further (Micallef, 2016). At the same time, tax amnesties on undeclared assets were granted between 2001 and 2005. Under these schemes, undeclared assets were regularized and channelled *inter alia* to the property market. A rationalization exercise by MEPA in 2006, which included the relaxation of height limitations and development in certain zones, meant that further development could take place. However this did not reduce pressure on prices and the boom persisted. According to advertised prices, the market hit a peak in 2007, reflecting similar developments in many advanced economies.[8]

Figure 1 shows that following the correction after 2007, house prices hit a trough in 2009. During this period, dwelling investment fell significantly to 3.5% of GDP in 2010 – half that at the peak of the market. Investment continued to fall further to a low of around 2.6% of GDP by 2014, but has since picked up, mirroring the recent increases in activity and house prices. Factors behind this recovery include the recent changes to the capital gains tax and tax on rental income, as well as the reduction of stamp duty paid by first-time buyers. These policies are believed to have boosted demand for property, mainly apartments and maisonettes. The current low interest rate environment may have stimulated portfolio rebalancing, increasing demand for property as a higher yielding asset.

Data on the rental market remains scarce. Various rent laws and amendments, which date back to the 1930s, regulated rents and over the years discouraged landlords from renting out their property. By

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[8] The house price index based on contracted prices, compiled by the NSO, times this peak in 2008. Although timing differences are expected due to the different source data used, both indicators tell a similar story.

1990, around 14% of dwellings in villages were vacant, partly reflecting an aversion by landlords to offer dwellings for rent to Maltese citizens (Demarco, 1995).[9] To address this, in 1995 the Requisitions Act of 1949 was reversed, with the aim of boosting the rental market. The reforms of 2009 were also passed through with these objectives in mind. Although there is little data on the rental market, changes in household formation could have increased activity in this market over the past years.[10] Furthermore, the recent large inflow of foreign workers - who tend to be more mobile - as well as new trends in tourism accommodation, could also have boosted the demand for rental property.

Given the developments highlighted earlier, home ownership grew from 60% in 1995 to around 75% in 2005 (NSO, 2007b; Camilleri, 2011). Eurostat estimates for 2014 put home ownership at 80%, while the proportion of tenants renting property at market prices was very low, with the majority renting at below-market prices (see Figure 3). It is expected that the large influx of foreign workers over the past few years, as well as the societal changes discussed above, should have led to an increase in the percentage of the population renting at market prices in 2015, and continue to raise it further in 2016 and beyond.

**Figure 3: Household tenure distribution in 2014**



Rent at subsidized price 18%
Rent at market price 2%
Owner 80%
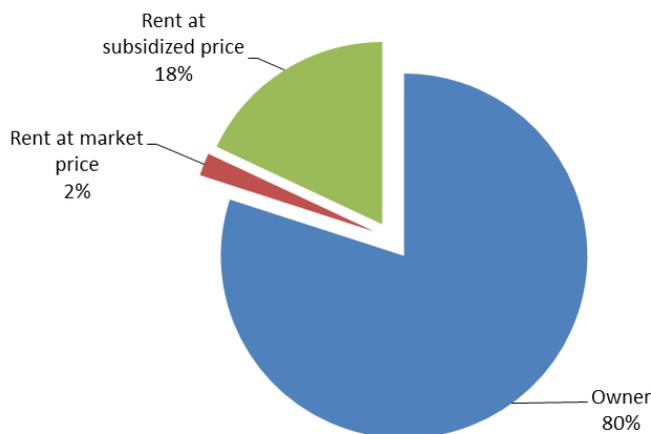
*Source: Eurostat (SILC)*

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[9] Other reasons include inherited property not being sold over the years and the existence of dilapidated property which may have been considered costly to repair.

[10] The average household size fell from 3.1 in 1995 (NSO, 2007a) to 2.7 in 2011 (NSO, 2014) since growth in the number of households outpaced population growth.

# What is the extent of misalignment in house prices?

Misalignment is defined as a situation in which house prices drift away from their fundamental value, measured relative to other macroeconomic variables. This section analyses the developments of house prices relative to long-term macroeconomic trends since the mid-1980s. The definition of the long-term trend can vary, from a simple time trend to more complex statistical and econometric filters, all of which are explored in this note. A key metric is the *house price-to-income ratio*, which tracks the affordability of property over time. For this analysis, the house price index in Grech (2015a) was used, which builds on the Central Bank of Malta's index based on advertised prices, together with compensation per employee as a proxy for income, also taken from the same source.[11] Measures of over/undervaluation relative to income were derived based on different statistical definitions of the trend.[12] While each statistical filter has its own advantages and limitations, the mix used in this note encompasses the assumption of constant behaviour since the 1980s on one end and that of potentially significant structural change on the other.[13] Therefore the results offer a plausible range for the extent of over/undervaluation relative to long-term trends in the house price-to-income ratio.

The resulting gap estimates presented below are based on the developments in house prices relative to those in income. However, there may be other factors which can determine whether such prices are above or below trend. Other key variables which may have an impact on house prices include the user cost, proxied by the cost of borrowing, and the stock of mortgages granted by banks. To address this, an econometric model was specified as in McCarthy and Peach (2004) in which in the long run, equilibrium house prices are a function of income, interest rates and the stock of credit.[14] In this setting, 'trend' or equilibrium house prices are given by the model, and any developments not

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[11]  The house price index based on asking prices dates back to the 1980s, a crucial feature for this analysis. Variables are in annual frequency, were extended with more recent data and deflated using the Retail Price Index. The index based on contracted prices, compiled by the NSO, starts from 2005 and is also used in a section below.

[12]  The definitions are: (i) linear time trend, (ii) time-varying trend from the Hodrick-Prescott filter, and (iii) time-varying trend estimated from the Kalman filter. The Hodrick-Prescott (HP) filter is a smoothing procedure typically used for business cycle analysis. Since financial cycles tend to be 3-4 times longer than business cycles (Borio, 2012; Drehmann *et al.* 2012), the smoothening parameter was adjusted using the Ravn and Uhlig (2002) power rule assuming financial cycles last 4 times longer, yielding $\lambda = 1,600$ (a lower ratio of 3 produces very similar results). The Kalman filter is a popular algorithm used *inter alia* to extract unobserved variables. In this setting, the house price-to-income ratio, which is observed, is specified as the sum of unobserved long-run trend and cyclical components. The latter components are inferred from the data conditional on following some statistical process. The trend is specified as a random walk subject to random shocks, and the cycle, or the deviation from the trend, as a cyclical AR(2) process with random shocks.

[13]  The linear time trend is easily understood, but is very restrictive and can be misleading during periods of structural change. The HP filter allows the trend to change smoothly over time, so it can capture structural changes implied by the data. However, it can be very sensitive to the value of the last observation in the series. The Kalman filter is the most flexible since it allows the user to modify the degree of variation of the trend relative to the cycle, but requires some modelling assumptions and beliefs from the analyst. The results should be interpreted with caution as statistical filters may be subject to start and end-point biases (Mohr, 2005). To limit this bias, the series for the price-to-income ratio was extended till 2020 using an AR(2) model with a linear time trend before the techniques were applied.

[14]  The model is an inverted demand equation and assumes that housing supply is fixed in the short run. Therefore, the results rest on the justifiable belief that observed prices were mainly driven by demand variables. Data on the housing stock is scarce and is plagued by measurement issues largely relating to 'vacant' property. Consequently, there is considerable uncertainty about actual supply.

explained by fundamental factors represent an extent of misalignment in actual house prices from equilibrium.

Figure 4 shows the estimates across both statistical and econometric methods. The statistical measures of misalignment are shown in the form of a range. All three statistical filters suggest a similar story. House prices were undervalued relative to income between the mid-1980s and the early 2000s, with the degree of misalignment narrowing gradually. This was followed by a period of overvaluation which peaked in 2005. This misalignment was gradually corrected and equilibrium was restored in 2009. Since then, house prices have been undervalued, although the trough was reached in 2012 and as at 2015 house prices stood close to their equilibrium value.[15] The econometric model suggests that house prices were broadly in equilibrium during much of the 1990s, but thereafter the extent of misalignment is very similar to that identified by the statistical filters. A key result that emerges from this empirical analysis is that as at 2015 house prices were not overvalued, but rather slightly undervalued by around 2.5%.[16]

**Figure 4: Estimates of house price misalignment**
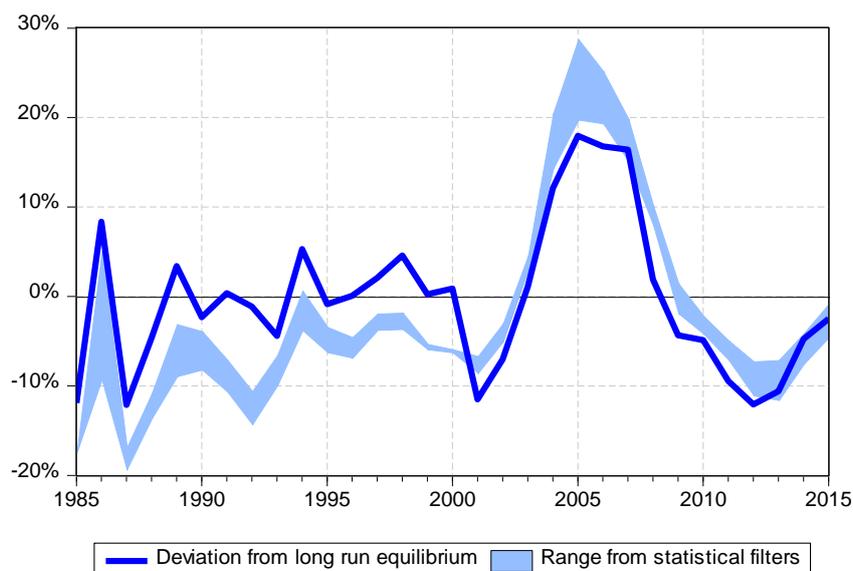


Source: authors' estimates

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[15] Note that these indicators may be subject to historical revisions when estimated over different samples.
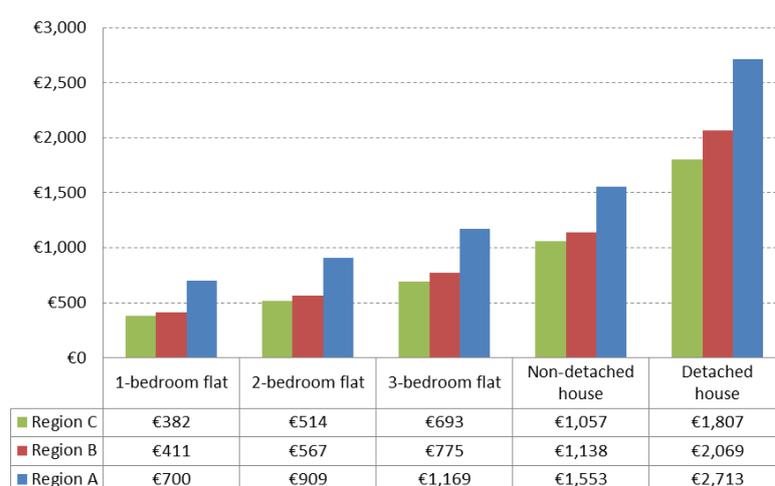[16] In a recent working paper, Micallef (2016) presents very similar results using a different modelling framework.

## What were the main trends in the rental market?

This section analyses private sector rent data, made available recently, for various property types for three key regions in Malta. This data is based on a survey of real estate agents for property located in a residential area of good quality and which has been built or was subject to major modernisation during the past 10 years. Consequently, the discussion that follows is believed to be merely indicative of the overall trends in the rental market.[17] Figure 5 below shows that average monthly rents in region A (Sliema, St Julians, Gzira and Valletta) are generally higher than those in other regions for all property types. The difference in rents between regions B (Mellieha, St Paul's Bay, Qawra and Bugibba) and C (Vittoriosa, Senglea, Cospicua and Marsaskala) is far less pronounced. For example, in 2015 the rent for a 1-bedroom flat in region B was only about €30 more expensive per month than in region C. On the other hand, the outlay for renting a 1-bedroom flat in region A covers that for a 3-bedroom flat in region C.

These data confirm the recent pick-up in the housing market, as rents have increased significantly over the period 2012-2015. Figure 6 shows that this increase has been broad-based, except for non-detached houses in region C. Flats, in particular, have been in high demand, with rents increasing by more than 30% over a 4-year period in nominal terms. Rents for 1-bedroom flats have risen mostly in region A, whereas in regions B and C, 3-bedroom flats experienced the highest cumulative growth in rents of about 50%. The largest increase was recorded in rents for detached houses in region A, which almost doubled from €1,517 to €2,713 a month over the same 4-year period.

**Figure 5: Monthly rent by property types and regions in 2015**



| | 1-bedroom flat | 2-bedroom flat | 3-bedroom flat | Non-detached house | Detached house |
|---|---|---|---|---|---|
| Region C | €382 | €514 | €693 | €1,057 | €1,807 |
| Region B | €411 | €567 | €775 | €1,138 | €2,069 |
| Region A | €700 | €909 | €1,169 | €1,553 | €2,713 |

*Source: NSO*

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[17] The primary purpose behind the collection of these data is to compare the relative cost of living in different cities of civil servants working for European Union institutions, and then adjust their salaries accordingly. For this reason, it is likely that these properties generally command rents that are higher than the national average (or median), which is why we suggest that the figures and trends are only indicative of the developments in the overall market. For further details, see Eurostat (2016).

These increases have recently stirred debate on the affordability of renting property in Malta. In this note, the increase in rents is rationalised with respect to the flipside of the property market - the outright purchase of property. Theoretically it is expected that house prices and rents move together in the long run, such that one would be indifferent between owning and renting a house.[18] To test this, rents and house prices in Malta were compared over a 10-year period spanning between 2006 and 2015, to analyse the extent of co-movement of these two prices. Figure 7 shows the movement of median rents across all regions and property types and median house prices as given by the NSO house price index.

**Figure 6: Cumulative growth in rents over the period 2012-2015**
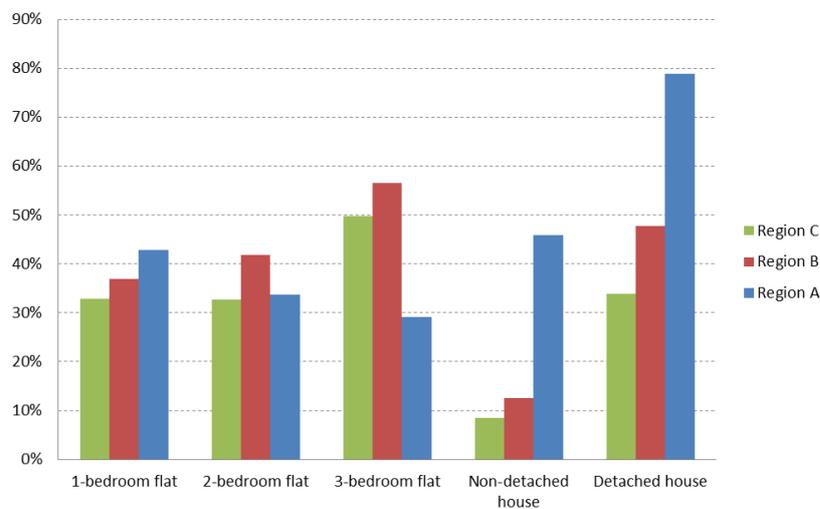


*Source: NSO*

**Figure 7: House prices and rents (2006 = 100)**



*Source: NSO and author's calculations*

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[18] Fox and Tulip (2014) show that in equilibrium the relationship between house prices ($P$) and rents ($R$) is given by: $P = R/\theta$, whereby $\theta$ is the user cost of housing and may include a measure of interest (the mortgage lending rate plus the owner's opportunity cost of equity), running costs (such as repairs and insurance), buying or selling costs (such as stamp duty and agent commission), physical depreciation and the expected real appreciation of the property net of any quality adjustments.

House prices and rents have grown broadly in line over the past 10 years, and increased by around 40% in nominal terms, equivalent to 20% in real terms, over this ten-year period.[19,20] Following strong increases in both house prices and rents between 2006 and 2008, the housing market entered a period of sluggishness up until 2012. Subsequently, a pick-up in both house prices and rents ensued as from 2013, although growth in rents has been more pronounced. The stronger pick-up in rents could be attributed to changes in household size and formation and the high inflow of foreign workers, both of which would have raised the demand for rents. Indeed the proportion of households with up to 2 persons increased from 44% in 2005 to 52% by 2014, and the number of single-parent households rose from 3,610 in 2005 to more than 6,000 by 2014.[21] Meanwhile, the number of foreign workers more than doubled from around 9,000 in 2010 to over 21,000 in 2014 (Grech, 2015b). Moreover, the stronger increase in rents relative to house prices is, in part, likely to be an automatic market response, re-equilibrating house prices and rents.

## What is the macroeconomic impact of a change in house prices in Malta?

The scope of this section is to measure the macroeconomic impact of a house price shock in Malta and outline the key channels through which such a shock propagates to the broader economy. Towards this end, simulations are carried out in STREAM (Structural and TRaditional Econometric model for Malta), the Central Bank of Malta's core macro-econometric model. A macro-econometric model provides the ideal methodological framework since it captures the interdependent nature of modern economies, where many variables and different sectors are interlinked. STREAM is a traditional structural model but unlike many models within its class, contains fully-fledged fiscal and financial blocks.[22]

Three separate simulations are carried out. The first shock is defined as a *permanent* exogenous increase in house prices by ten percent, which shifts the level of house prices over the entire three year simulation horizon. The second shock is defined as a *temporary* exogenous increase in house prices by ten percent, which only shifts the level of house prices in the first quarter of the simulation horizon. The results that emerge from these two simulations are generally not directly comparable to those found in the literature, since many studies base their analysis on a vector autoregression (VAR) model and thus define the shock in a different manner. For this reason, a third simulation is conducted to allow for the comparability of the results with those from other studies in the literature, where the shock is defined as a *temporary* one standard deviation increase in house prices, which only shifts the

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[19]    The Retail Price Index was used as the deflator.
[20]    It is implicitly assumed that the user cost of housing has been fixed or has not changed by much during this period.
[21]    Source: Eurostat (SILC)
[22]    Further details are presented in Grech and Rapa (2016).

growth rate of house prices in the first quarter of the simulation horizon, and thus matches that found in other studies.[23,24]

**The Macroeconomic Impact of a Permanent House Price Shock in Malta**

The first simulation reveals that a permanent increase in house prices raises wealth, and thus private consumption, and boosts dwelling investment (see table 1). These developments translate into higher GDP, which, in turn, stimulates employment and wages. Government consumption expands as a result of an increase in public compensation of employees and public intermediate consumption. This leads to a further improvement in GDP, which is partially offset by a rise in imports. The growth in GDP exerts upward pressure on prices. This gives rise to a loss in competitiveness and consequently exports decline gradually. On balance, however, GDP increases. Elevated economic activity, in turn, stimulates investment further, with the other categories of investment – namely non-housing investment and government investment – also being affected. Higher GDP brings about lower unemployment.

On the fiscal front, government revenue rises due to higher macroeconomic bases. Government expenditure also increases since the growth in public compensation of employees, public intermediate consumption and public investment outweigh the drop in interest payments paid by the Government. The net effect translates into a rise in the government balance ratio – implying an improvement in the deficit ratio – which causes the government debt ratio to fall.

Turning to financial developments, a positive shock to house prices reduces non-performing loans. This, in turn, decreases the probability of default, which prompts banks to lower retail lending rates. This drop in lending rates, coupled with a decline in the probability of default and higher house prices, results in an expansion of credit. Consequently, this boosts banks' profits, despite the fall in lending rates. Higher profitability gives rise to an increase in equity, but this is outweighed by the rise in risk weighted assets brought about by the decrease in the probability of default, and thus the capital adequacy ratio deteriorates, albeit marginally.

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[23]  Since the model is linear, a *decrease* – rather than an increase – in house prices by the same magnitude would yield identical results, with the opposite sign.

[24]  Throughout this section, the house price data used is that published by the Central Bank of Malta, based on advertised prices.

**Table 1: The Macroeconomic Impact of a Permanent House price Shock in Malta (First Simulation)**

*Percentage changes from baseline levels unless otherwise specified*

| | Year 1 | Year 2 | Year 3 |
|---|---|---|---|
| **Economic Activity** | | | |
| Real GDP | 0.08 | 0.22 | 0.21 |
| Private consumption | 0.67 | 1.17 | 1.11 |
| Government consumption | 0.02 | 0.13 | 0.06 |
| Gross fixed capital formation | 0.20 | 0.69 | 0.92 |
| Exports | 0.00 | -0.04 | -0.09 |
| Imports | 0.39 | 0.54 | 0.47 |
| | | | |
| **Gross Fixed Capital Formation** | | | |
| Private sector non-housing | 0.02 | 0.26 | 0.40 |
| General government | 0.24 | 0.71 | 0.92 |
| Housing | 1.73 | 5.48 | 5.44 |
| | | | |
| **Prices** | | | |
| GDP deflator | 0.01 | 0.05 | 0.13 |
| | | | |
| **Labour Market** | | | |
| Unemployment rate* | 0.00 | -0.02 | -0.02 |
| Total employment | 0.01 | 0.10 | 0.19 |
| Total compensation to employees | 0.02 | 0.25 | 0.31 |
| | | | |
| **Fiscal Developments** | | | |
| Total receipts | 0.27 | 0.58 | 0.61 |
| Total expenditures | 0.03 | 0.14 | 0.21 |
| Balance** | 0.10 | 0.19 | 0.17 |
| Gross Debt** | -0.16 | -0.49 | -0.69 |
| | | | |
| **Financial Developments** | | | |
| House prices | 10.00 | 10.00 | 10.00 |
| Non-performing loans ratio* | -0.46 | -0.80 | -0.85 |
| Average retail lending rate* | 0.00 | -0.04 | -0.02 |
| Loans to the private sector | 1.10 | 2.42 | 3.43 |
| Banks' profits | 0.72 | 1.33 | 3.36 |
| Capital adequacy ratio* | -0.11 | -0.23 | -0.39 |

\* Absolute changes from baseline in p.p.
\*\* Absolute changes from baseline as % of GDP
Source: authors' calculations

## The Macroeconomic Impact of a Temporary House Price Shock in Malta

The results of the second simulation suggest that a temporary increase in house prices propagates to the broader economy via the same channels described earlier (see table A.1 in the annex). However, since the shock is temporary in nature, the magnitudes are lower. Moreover, its effect broadly dies out by the end of the simulation horizon, with the exception of some financial sector variables – namely credit and banks' profits – because of lagged responses.

The third simulation, carried out for comparability, shows that a temporary one standard deviation increase in house prices has a peak impact on real GDP growth of around 0.15 percentage points, reached after five quarters, and that the effect of the shock dies out after around two years (see figure 8). These results are broadly consistent with the findings of other studies in the literature that report

impulse responses similar to that presented below and also suggest that a house price shock has a limited effect on GDP growth.[25]

**Figure 8: The Impact of a Temporary House Price Shock in Malta on Real GDP (Third Simulation)**

Real GDP (percentage point changes from baseline year-on-year growth rates)
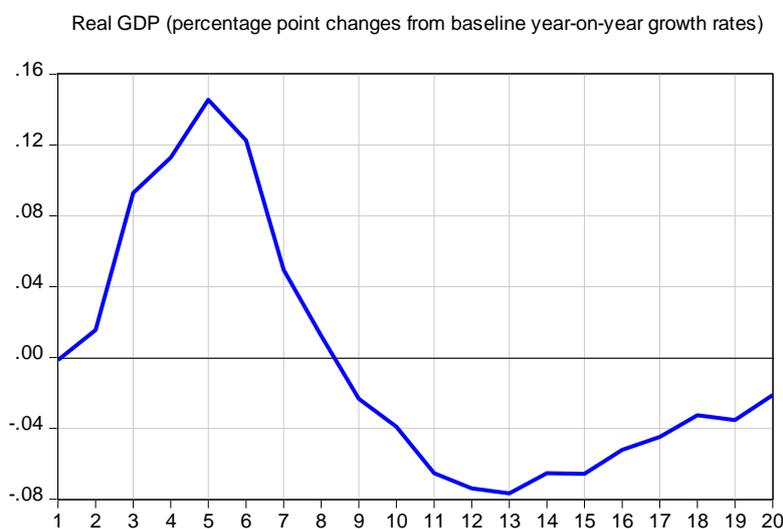


Source: authors' calculations

**Key Messages**

Two key messages can be drawn from these results. First, in Malta, a house price shock influences the wider economy through three main channels: private consumption, housing investment and credit. Second, the macroeconomic impact of a domestic house price shock is limited. Under the first simulation, the more severe of the three, house prices were shocked permanently by ten percent over the entire three year horizon. To put the magnitude of the shock in context, table 2 below shows the actual three-year moving average year-on-year growth in house prices in Malta.

**Table 2 – Actual Three-Year Moving Average Year-on-Year Growth in House Prices in Malta**

|      | %    |
|------|------|
| 2003 | 9.0  |
| 2004 | 14.1 |
| 2005 | 14.5 |
| 2006 | 11.2 |
| 2007 | 4.8  |
| 2008 | 0.6  |
| 2009 | -2.2 |
| 2010 | -2.2 |
| 2011 | -0.9 |
| 2012 | 1.0  |
| 2013 | 1.3  |
| 2014 | 3.2  |
| 2015 | 5.1  |

Source: Central Bank of Malta and authors' calculations

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[25]  See ECB (2015) and Goodhart and Hoffman (2008).

While a permanent (three year) ten percent *positive* shock is plausible – given that actual data suggest that there have been periods when the three-year moving average house price growth exceeded ten percent (2004, 2005 and 2006) – a permanent (three year) ten percent *negative* shock seems highly unlikely since the worst actual three-year moving average decline in house prices was only 2.2 percent (2009 and 2010). Moreover, even if a permanent (three year) ten percent negative shock were to materialise, the simulation results reveal that the macroeconomic impact is likely to be contained, with the peak impact on GDP only reaching 0.22 percent.

These key messages are subject to two important caveats. First, often economic shocks do not happen in isolation. A house price shock might be caused by other shocks (e.g. an international financial crisis) and might itself trigger further shocks (e.g. a drop in investor confidence), which would amplify the macroeconomic impact. That said, STREAM is equipped to measure the impact of such scenarios. Second, the model used is linear and hence does not capture non-linearities, that is, it does not cater for the possibility that the economic relationships being modelled might be dependent on the state of the economy. For instance, the economy might respond differently to a house price shock that occurs during a period of economic and financial stress than it would to a shock that arises in 'normal' times.

# Policy Implications

A number of policy implications emerge from this analysis. First, the compilation of more timely and representative data, on both house prices and rents, would allow for a quicker and more comprehensive assessment of housing market developments. This, in turn, would make it possible to identify misalignments and allow policy makers to take corrective action in a timely manner. A hedonic house price index, which disentangles house price changes which are due to differences in the quality of the units being sold from house prices movements brought about by changes in demand and supply, as well as more representative data on rents, would contribute in this regard.

The second policy implication relates to policies that increase market efficiency in bridging demand and supply. For instance, easing restrictions on the sale of property boosts the supply of housing and reduces the stock of otherwise vacant property which dilapidates over the years. This, in turn, eases pressure off prices, contributing to a lower likelihood of unsustainable price increases. The recent amendment to the Civil Code on the quicker sale of inherited property is an example. The regeneration of certain areas in Malta could also boost demand for property there and thus encourage the renovation of vacant properties which are in need of major repair.

Finally, although the macroeconomic impact of a domestic house price shock is contained and, consequently, threats to macroeconomic and financial stability emanating from exposure to the housing market appear to be limited, a house price shock might not occur in isolation. This highlights the importance of assessing whether the financial system, and the economy more broadly, is resilient enough to withstand unlikely but plausible scenarios, where the economy is hit by a number of adverse shocks. Such stress testing exercises are conducted regularly by the Bank. Finally, policies aimed at limiting contagion effects will serve to prevent the amplification of shocks, thus containing the macroeconomic consequences of changes in house prices.

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# Annex

**Table A.1: The Macroeconomic Impact of a Temporary House Price Shock in Malta (Second Simulation)**

*Percentage changes from baseline levels unless otherwise specified*

|  | Year 1 | Year 2 | Year 3 |
|---|---|---|---|
| **Economic Activity** | | | |
| Real GDP | 0.05 | 0.02 | -0.01 |
| Private consumption | 0.29 | 0.03 | -0.06 |
| Government consumption | 0.01 | 0.02 | -0.03 |
| Gross fixed capital formation | 0.11 | 0.07 | 0.01 |
| Exports | 0.00 | -0.01 | -0.01 |
| Imports | 0.15 | 0.00 | -0.04 |
| | | | |
| **Gross Fixed Capital Formation** | | | |
| Private sector non-housing | 0.02 | 0.07 | 0.02 |
| General government | 0.11 | 0.06 | 0.00 |
| Housing | 0.96 | -0.01 | -0.04 |
| | | | |
| **Prices** | | | |
| GDP deflator | 0.00 | 0.02 | 0.03 |
| | | | |
| **Labour Market** | | | |
| Unemployment rate* | 0.00 | -0.01 | 0.00 |
| Total employment | 0.01 | 0.04 | 0.02 |
| Total compensation to employees | 0.01 | 0.08 | 0.00 |
| | | | |
| **Fiscal Developments** | | | |
| Total receipts | 0.12 | 0.05 | -0.01 |
| Total expenditures | 0.02 | 0.03 | 0.01 |
| Balance** | 0.04 | 0.01 | -0.01 |
| Gross Debt** | -0.08 | -0.08 | -0.06 |
| | | | |
| **Financial Developments** | | | |
| House prices | 2.52 | 0.00 | 0.00 |
| Non-performing loans ratio* | -0.22 | -0.03 | 0.00 |
| Average retail lending rate* | 0.00 | -0.01 | 0.01 |
| Loans to the private sector | 0.20 | 0.30 | 0.21 |
| Banks' profits | 0.30 | 0.19 | 0.51 |
| Capital adequacy ratio* | -0.03 | -0.04 | -0.03 |

\* Absolute changes from baseline in p.p.

\** Absolute changes from baseline as % of GDP

Source: authors' calculations