



# MALTA

## SELECTED ISSUES

February, 2017

This paper on Malta was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on February 2, 2017.

Copies of this report are available to the public from

International Monetary Fund • Publication Services  
PO Box 92780 • Washington, D.C. 20090  
Telephone: (202) 623-7430 • Fax: (202) 623-7201  
E-mail: [publications@imf.org](mailto:publications@imf.org) Web: <http://www.imf.org>  
Price: \$18.00 per printed copy

**International Monetary Fund**  
**Washington, D.C.**



# MALTA

## SELECTED ISSUES

February 2, 2017

Approved By  
European Department

Prepared by Christian Ebeke, Nina Budina, and Federico  
Grinberg

## CONTENTS

<b>THE NON-FINANCIAL CORPORATE SECTOR IN MALTA: BALANCE SHEET VULNERABILITIES AND IMPACT ON INNOVATION</b>	<b>3</b>
A. Exposure of Maltese Non-Financial Corporations to Shocks	3
B. Resilience of Maltese Non-Financial Corporations to Shocks	8
C. Firms' Leverage and Investment in Innovation	10
D. Conclusions	12
<b>FIGURES</b>	
1. Predicted Effect of Leverage	11
2. Predicted Effect of Sales Growth	12
<b>References</b>	<b>13</b>
<b>HOUSING SECTOR: POTENTIAL VULNERABILITIES</b>	<b>14</b>
A. Introduction	14
B. Dynamics of House Prices and Fundamentals	17
C. Households Indebtedness and Bank's Exposure to House Price Shocks	18
D. Conclusions	22
<b>FIGURES</b>	
1. Property Market Demand	15
2. Property Market Supply	16
3. Banks' Exposure to the Property Market	19
4. Households' Exposure to the Property Market	20
<b>TABLE</b>	
1. Households' Balance Sheet Indicators by Income Bracket	21

<b>References</b>	<b>23</b>
<b>A FINANCIAL CONDITIONS INDEX FOR MALTA</b>	<b>24</b>
A. Introduction	24
B. Constructing a Financial Conditions Index for Malta	25
C. Result	25
D. Forecasting Properties of FCI	27
E. Conclusions	28
<b>References</b>	<b>29</b>

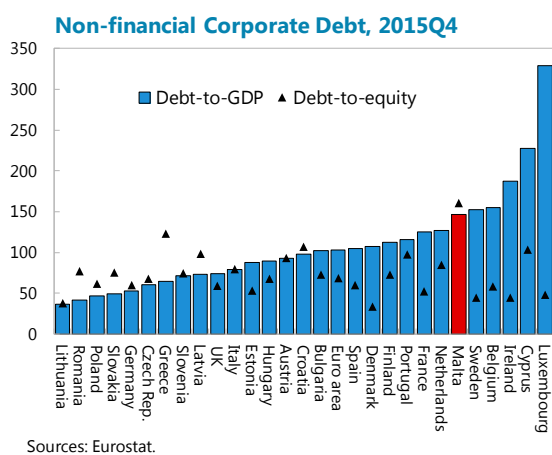
# THE NON-FINANCIAL CORPORATE SECTOR IN MALTA: BALANCE SHEET VULNERABILITIES AND IMPACT ON INNOVATION<sup>1</sup>

Non-financial corporations' debt is relatively high in Malta and poses a number of challenges. This paper uses firm-level data to examine the vulnerability of Maltese firms, measured by their exposure and resilience to shocks. In addition, the paper investigates the effect of firms' balance sheets on investment in innovation. The results indicate that, while the financial health of medium and large firms has improved in recent years, vulnerabilities remain in the construction sector and for small and medium enterprises (SMEs). Furthermore, the analysis finds that firms with weaker balance sheets tend to invest less in innovation, even during "good times". Policy implications are three-fold: (i) accelerating the restructuring of corporate balance sheets of highly leveraged, but viable firms, (ii) improving the insolvency framework to allow a fast exit of non-viable companies, and (iii) expanding corporate funding options for SMEs including via non-bank financing alternatives.

## A. Exposure of Maltese Non-Financial Corporations to Shocks

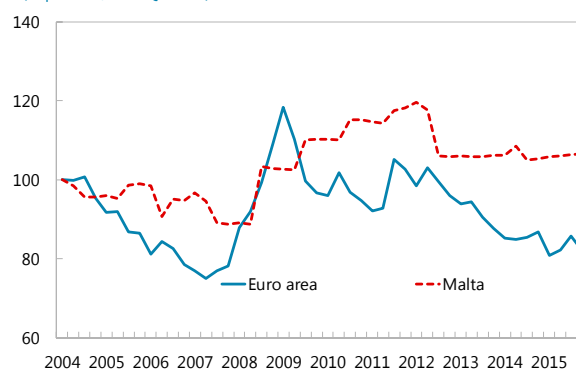
### 1. Non-financial corporate leverage is high in Malta compared with European peers.

The risk for overleveraged firms is that companies are restricted from further investment and instead concentrate on paying off loans. Reducing private debts becomes more difficult to sustain when the economy slows down. In two alternative measures, Malta debt appears high: Debt-to-Assets is close to 150 percent and debt-to-equity is about 160 percent at end 2015. Following a rapid increase in indebtedness, the deleveraging process started in 2012 with debt-to-assets declining by about 15 percentage points between 2012 and 2015. Still, NFC leverage remains higher than its pre-crisis average.



### Malta: Debt-to-Equity Ratio

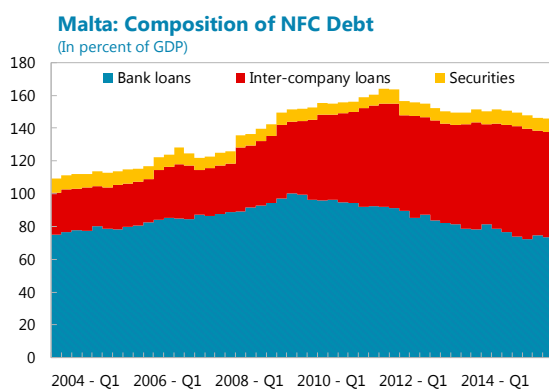
(in percent; 2004Q1=100)



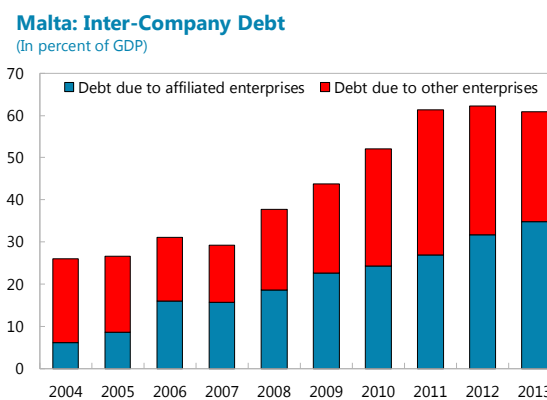
<sup>1</sup> Prepared by Christian Ebeke (EUR).

## 2. Inter-company loans represent a large share of debt, thereby providing a cushion.<sup>2</sup>

The high reliance on inter-company loans is a dampening factor given their relative stability and limited impact on the domestic banking system. Inter-company lending amounts to 46 percent of NFC total debt and has increased significantly since 2010 when the bank deleveraging process started. Intra-company debt has risen over the years and represents more than half the stock of total inter-company debt. However, it is worth mentioning that the reliance on inter-company loans is very likely to be a unique characteristic of larger corporations compared with smaller local firms with limited external finance options.



Source: Central Bank of Malta



Sources: CBM, IMF Balance of Payments Statistics (BPM5), and IMF staff calculations.

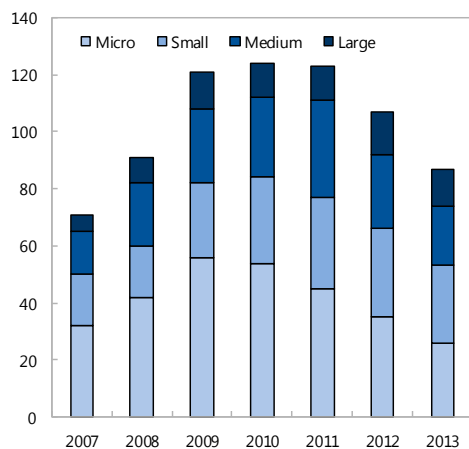
**3. In this paper, we rely on the Orbis BvD database, which provides a rich source of firm-level data over a reasonable time span.** The dataset covers firm-level data for Malta with more than 5,000 firms over the period 2007-2013.<sup>3</sup> Despite its appeal, there are a number of limitations, leading to some caution when interpreting the results. Not all the firms report data on all the variables leading to substantial data gaps. Attrition is also important as not the same pool of firms is observed every year. The sample is dominated by SMEs. For the purpose of the study, the financial sector, gambling activities, agriculture, electricity and water utilities are excluded from the sample due to the limited number of firms recorded in these sectors in the database. Overall, the number of firms for which we can compute relevant financial ratios of interest varies between years and peaks at 127 in the year 2012 in the case of the computation of the interest coverage ratio (EBITDA divided by interest expenses) and 828 firms in the case of leverage ratio (total debt divided by assets). Given the limited coverage of firms reporting the number of employees, the breakdown of firms by size is achieved through the sales volume following the standard breakdown of firms by size in the EU: Microenterprises are defined as enterprises whose annual turnover does not exceed EUR 2 million; Small enterprises whose

<sup>2</sup> Inter-company debt refers to debt between all companies. Intra-company debt refers to debt between companies of a same group.

<sup>3</sup> The time coverage of the dataset will not take into account possible improvements in some sectors (e.g. construction, real estate) over the most recent years.

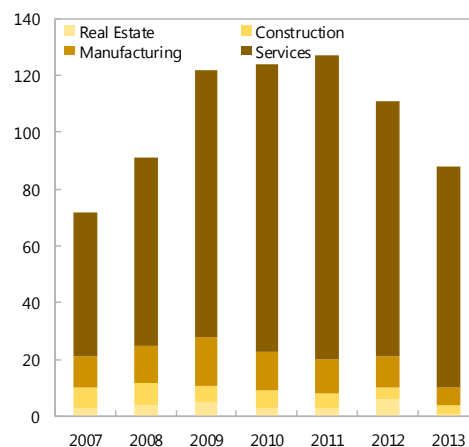
annual turnover does not exceed EUR 10 million; medium-sized enterprises have an annual turnover not exceeding EUR 50 million; large enterprises have an annual turnover exceeding EUR 50 million. Despite some of its limitations, the Orbis dataset mimics broader regularities observed in official register data from the NSO: dominant role of smaller firms, including within sectors.<sup>4</sup>

**Malta: Number of Firms in the Sample**  
(Number of firms with data on Interest Coverage Ratio)



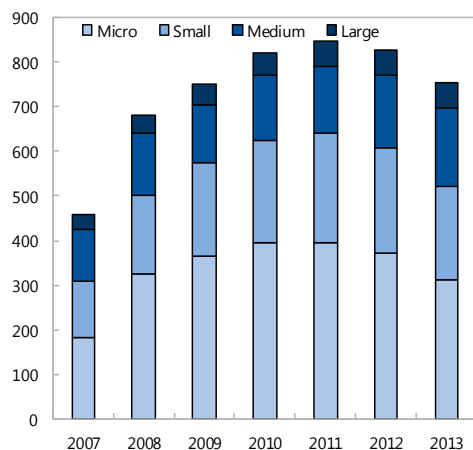
Sources: Orbis, BvD and IMF staff calculations.

**Malta: Sectoral Distribution of Firms in the Sample**  
(Number of firms with data on Interest Coverage Ratio)



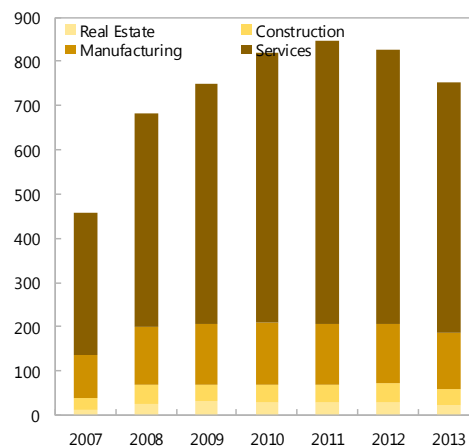
Sources: Orbis, BvD and IMF staff calculations.

**Malta: Number of Firms in the Sample**  
(Number of firms with data on Leverage Ratio)



Sources: Orbis, BvD and IMF staff calculations.

**Malta: Sectoral Distribution of Firms in the Sample**  
(Number of firms with data on Leverage Ratio)



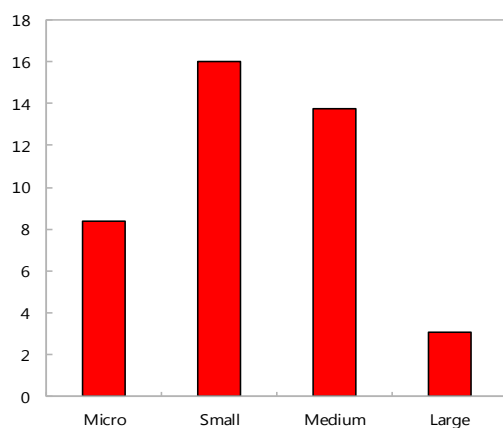
Sources: Orbis, BvD and IMF staff calculations.

<sup>4</sup> [https://nso.gov.mt/en/News\\_Releases/View\\_by\\_Unit/Unit\\_B4/Business\\_Registers/Pages/Business-Demographics.aspx](https://nso.gov.mt/en/News_Releases/View_by_Unit/Unit_B4/Business_Registers/Pages/Business-Demographics.aspx)

#### 4. Aggregate measures of leverage mask considerable sectoral and size heterogeneities.

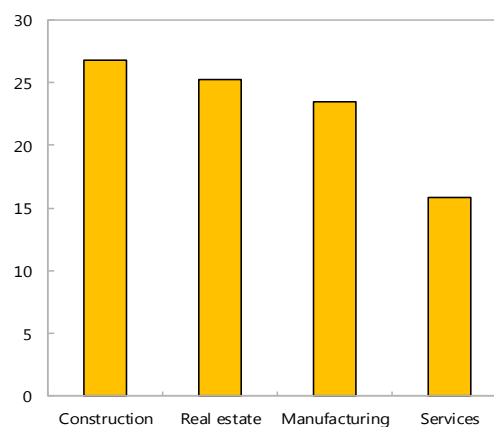
Firm-level data (Orbis, BvD) for Malta suggest that the average leverage ratio (measured by firm debt in percent of total assets) is higher for SMEs compared to large firms, in line with previous works (Grima and Vella, 2014; IMF, 2014). Consistent with IMF (2014), firm-level data indicate that the construction sector and real estate exhibit the highest leverage ratios, followed by the manufacturing and the service sector.

**Malta: Leverage Ratio**  
(Debt in percent of assets; median values over 2012-13)



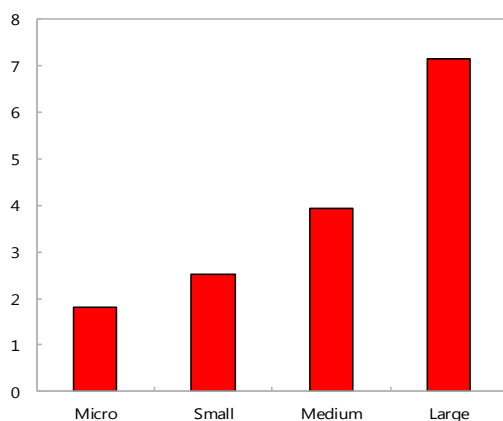
Sources: Orbis BvD and IMF staff calculations

**Malta: Leverage Ratio**  
(Debt in percent of assets; median values 2012-13)



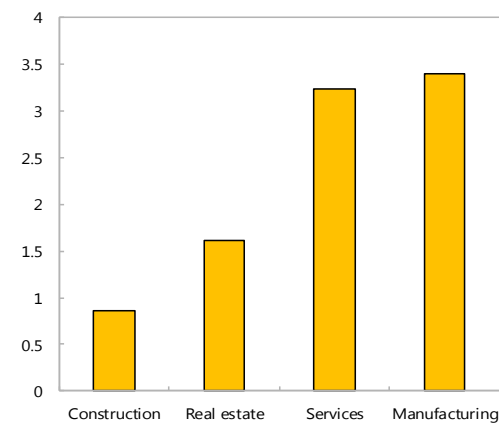
Sources: Orbis BvD and IMF staff calculations.

**Malta: Profitability Ratio**  
(ROA; median values over 2012-13)



Sources: Orbis BvD and IMF staff calculations

**Malta: Profitability Ratio**  
(ROA; median values 2012-13)

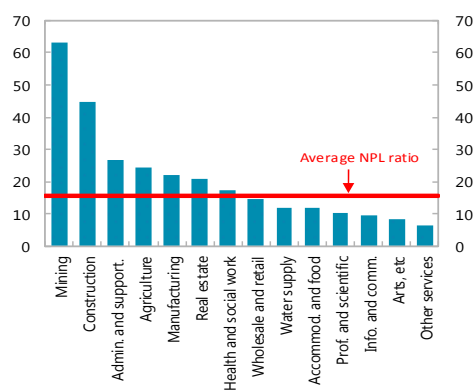


Sources: Orbis BvD and IMF staff calculations.

**5. Profitability is unevenly distributed across firm size and sectors.** Return on assets and return on equities are low for smaller and medium-sized firms in Malta as opposed to large firms. This in part may reflect the impact of elevated debt service payments on the profitability of highly leveraged SMEs. Construction, where SMEs are prevalent, has notably a lower return on assets, again consistent with excessive leverage.

**6. Weaker firm balance sheets are weighing on banks.** Sectors with elevated indebtedness are reporting higher NPLs ratios. Recent data show a concentration of NPL ratios well above the country's average in the mining and in the construction sectors. The manufacturing sector is also reporting significant NPLs along with the real estate sector. Most of the service sectors show opposite figures, consistent with their limited leverage and relatively higher profitability ratios.

**Malta: Non-performing Loan Ratio by Sector**  
(NPL ratio > 1 percent, end-March 2016)



Source: FINREP.

**7. One way to assess the exposure of NFCs to risks is through their Interest Coverage Ratio (ICR).**

The ICR is measured by the ratio between the firms' earnings before interest, taxes, depreciation and amortization (EBITDA), and the firms' interest expenses.<sup>5</sup> Firms whose EBITDA is less than interest payments due (i.e. ICRs of less than 1) are referred as being in "technical default". In such situations, many of these firms can survive for some time by selling assets to meet their debt obligations, but if their ICRs remain below 1 for a sustained period, they will eventually run out of assets and actual defaults will ensue. A firm with an ICR between 1 and 2 is generally regarded as being at "heightened risk".

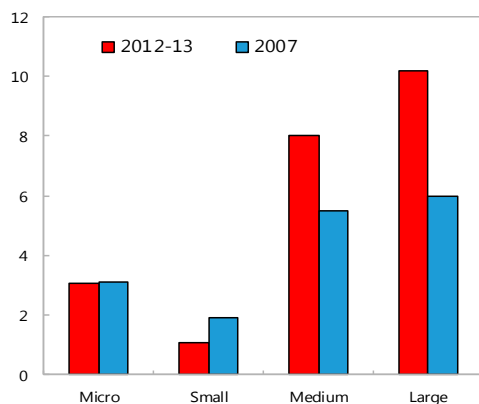
**8. There is a considerable heterogeneity in the distribution of the ICR across firms.**

Micro and small firms present relatively low ICR levels compared with medium-size and large corporations. In terms of sectors, the median firm in the construction sector is seen as already in "technical default" with an ICR dropping from about 2 in 2007 to below 1 in 2012-13. It is worth noting that the time coverage of the dataset does not take into account possible improvements in some sectors (e.g. construction, real estate) after the year 2013, boosted by rising property prices. The manufacturing sector also posts a median ICR which dropped to below 2, suggesting rising risks. The real estate and service sectors experienced a strengthening of ICR values. In the next section, we test for the resilience of the NFC sector to both income and interest shocks to better assess the sources of vulnerabilities.

<sup>5</sup> The Orbis dataset has a good coverage of firm debt level but limited information on interest expenses making the computation of the ICR challenging. To deal with large missing values on the ICR, we proceeded in two steps. First we estimated the interest expenses for the missing cells using the average effective rate (interest expenses over lagged debt) at the firm size-time level. Then we used it to approximate the missing interest expenses and then the ICR. A number of procedures were applied to deal with outliers in the dataset (e.g. ICR values were bounded at 0 and 50). Only observations on which the information on EBITDA, Debt, interest expenses, and cost of employees were kept to compute the ICR and produce the shock analyses. We end up with more than 700 observations for the ICRs over the period 2007-2013.

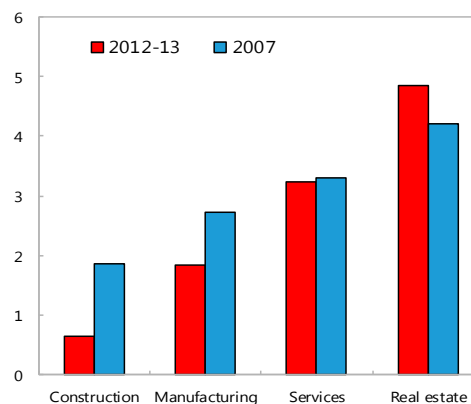


**Malta: Interest Cover Ratio**  
(EBITDA/Interest Expenses)



Sources: OrbisBvD and IMF staff calculations

**Malta: Interest Cover Ratio**  
(EBITDA/Interest expenses)



Sources: OrbisBvD and IMF staff calculations.

## B. Resilience of Maltese Non-Financial Corporations to Shocks

**9. This section tests for the resilience of NFCs in Malta to adverse shocks.** Three types of shocks are considered: (i) an interest rate shock; (ii) a profit shock; and (iii) an interest rate-profit combined shock. In this static exercise, we define all three shocks on the basis of end-2013 balance sheets.

- **Interest rate shock.** We use the calculated effective interest rate of each firm at end-2013 ( $i_{eff,t-1}$ ), and we apply a 400bp shock, which is broadly consistent with the ECB sensitivity analysis of house prices and interest rate shocks in Malta (see Central Bank of Malta, 2013). In addition, and in line with the importance of intra-company loans in Malta, we assume that only 40 percent of the 2013 debt stock ( $Debt_{t-1}$ ) will be rolled-over with a higher interest rate:

$$Interest\ expense_{i\_shock,t} = \frac{i_{eff,t} + 4}{100} \cdot 0.4 \cdot Debt_{t-1} + \frac{i_{eff,t}}{100} \cdot 0.6 \cdot Debt_{t-1}$$

The ICR in the interest rate shock scenario is then given by:<sup>6</sup>

$$ICR_{i\_shock,t} = \frac{EBITDA_t}{Interest\ expense_{i\_shock,t}}$$

- **Profit shock.** This scenario simulates an economic downturn, leading to lower profitability. Lower profits are derived by applying a negative shock to the firms' added value (15 percent, which is about five times the decline in NFC nominal value added observed in 2009), while holding the costs of employees constant at their baseline level. The rigidity in the costs

<sup>6</sup> We adjusted the computed ICR values to 0 if EBITDA is negative and to 50 if the observed ICR is above this value.

reflects firms' tendency to hoard labor in the short run at least until the magnitude and length of the shock become clearer. The ICR in this scenario is then given by:

$$\begin{aligned} EBITDA_{profit\_shock,t} &= \text{Added value}_t - \text{Costs of employees}_t \\ &= \text{Added value}_{t-1} * 0.85 - \text{Costs of employees}_{t-1} \end{aligned}$$

$$ICR_{profit\_shock,t} = \frac{EBITDA_{profit\_shock,t}}{Interest\ expense_t}$$

- **Combined interest rate and profit shock.** This shock combines the two shocks that are discussed above to affect the numerator and the denominator. The ICR in this shock is given by:

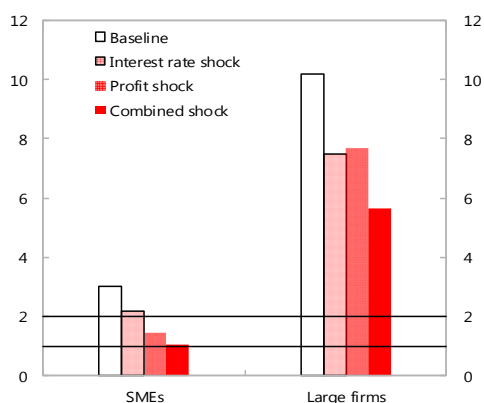
$$ICR_{combined\_shock,t} = \frac{EBITDA_{profit\_shock,t}}{Interest\ expense_{i\_shock,t}}$$

**10. The sensitivity analysis suggests that Maltese corporations, particularly SMEs, are vulnerable to adverse macroeconomic changes.** In particular:

- A 400bp interest rate shock would push the median SMEs' ICR from 3 in the baseline to just above 2. For large firms, the shock lowers the median ICR but it remains well above the risk thresholds. This can suggest the limited vulnerability of large firms either due to their relatively low leverage and the liquidity of their assets. The most vulnerable group therefore appears to be SMEs, reflecting their high leverage and debt service payments. In terms of sectors, the interest rate shock would push the median ICR in the manufacturing sector to the "heightened risk" category (ICR between 1 and 2). The service sector seems to withstand such a shock, whereas the decline in the ICR is substantial for the real estate sector.
- A profit shock would push the ICR of the median SMEs down to below 2, suggesting the severity of the shock for the balance sheet of SMEs compared to the interest rate shock. For large corporations, the profit shock has a similar effect on the median ICR than the interest shock, suggesting the importance of income shocks on the Maltese economy. In terms of sectors, the income shock has a smaller effect on the real estate sector compared with the interest rate shock, suggesting elevated leverage in the sector. Interestingly, the shock pushes the median firm in the service sector very close to the "heightened risk" status with an ICR at just 2. This suggests the key role of income and profitability shocks on the service sector despite its moderate leverage.
- Finally, a combined shock of tighter financial conditions and lower growth would have a sizable impact on firms' balance sheets, and thus likely to push many firms into a vulnerable situation. In particular, in the combined shock scenario, the median ICR for SMEs decreases to levels close to "technical default" whereas large firms remain able to withstand the shocks. Importantly, all sectors (except the real estate) will fall into the "heightened risk" category in presence of a combined income and interest shocks, although the construction sector and to

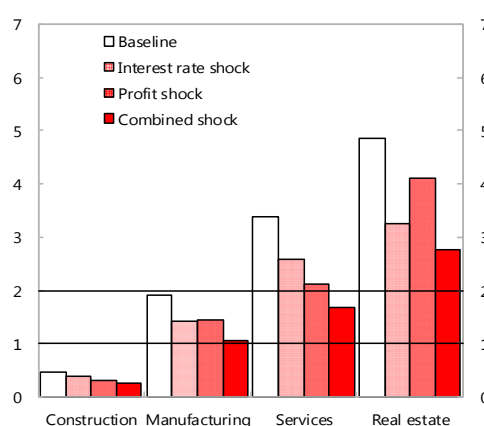
some extent the manufacturing will be in “technical default” under the combined shock scenario.

**Malta: Interest Cover Ratio by Firm Size**  
(EBITDA/Interest expenses; median values in 2013)



Sources: Orbis, BvD and IMF staff calculations.

**Malta: Interest Cover Ratio by Sector**  
(EBITDA/Interest expenses; median values in 2013)



Sources: Orbis BvD and IMF staff calculations.

## C. Firms' Leverage and Investment in Innovation

**11. We investigate the effect of leverage on firm decisions on investment in innovation.** The Orbis database provides rich data on the breakdown into tangible and intangible fixed assets. Due to limited data coverage on firm R&D spending levels, changes in intangible fixed assets provide a reasonable proxy for innovation, though intangible assets are still subject to measurement challenges.<sup>7</sup> We follow previous works on the determinants of firm investment using micro data (IMF, 2016) and fit the percent change in intangible fixed assets on firm leverage and other characteristics. Conditional on other factors that explain firm investment, a higher leverage is expected to be negatively associated with investment:

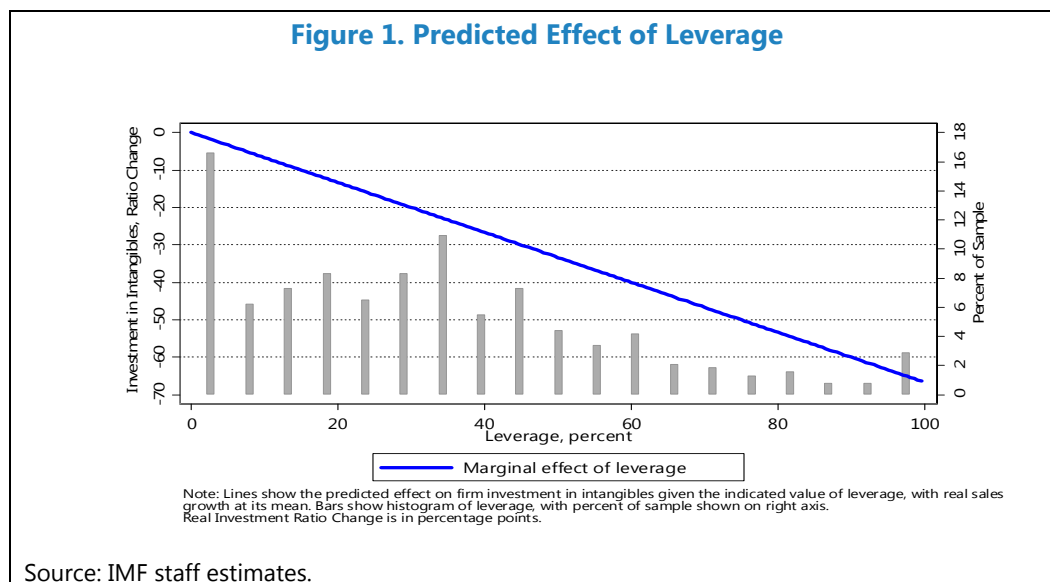
$$\left(\frac{I_{is,t}}{K_{is,t-1}}\right) = \beta_1 \left(\frac{DEBT}{ASSETS}\right)_{is,t-1} + \beta_2 (SALESGRO)_{is,t} + \mathbf{X}'_{is,t-1} \boldsymbol{\theta} + \alpha_i + \alpha_{s,t} + \epsilon_{is,t}$$

Here,  $I$  is the firm's net investment in intangible fixed assets,  $K$  its intangible fixed assets,  $DEBT$  its total debt,  $ASSETS$  its total assets,  $SALESGRO$  its real sales growth (a proxy for firm-specific demand shocks).<sup>8</sup> All ratios and growth rates are expressed in percent. The vector  $\mathbf{X}$  includes the natural log of total assets (following Kalemli-Ozcan and others, 2015).  $i$  indexes firms and  $t$  indexes years. Each firm belongs to a particular sector  $s$ .  $\alpha_i$  denotes the set of firm-specific effects which capture time-invariant unobservable factors at the firm level, while  $\alpha_{s,t}$  denotes the set of sector-year-specific fixed effects that capture common shocks to firms belonging to the same

<sup>7</sup> Among other, intangible assets include patent, trademarks, business methodologies.

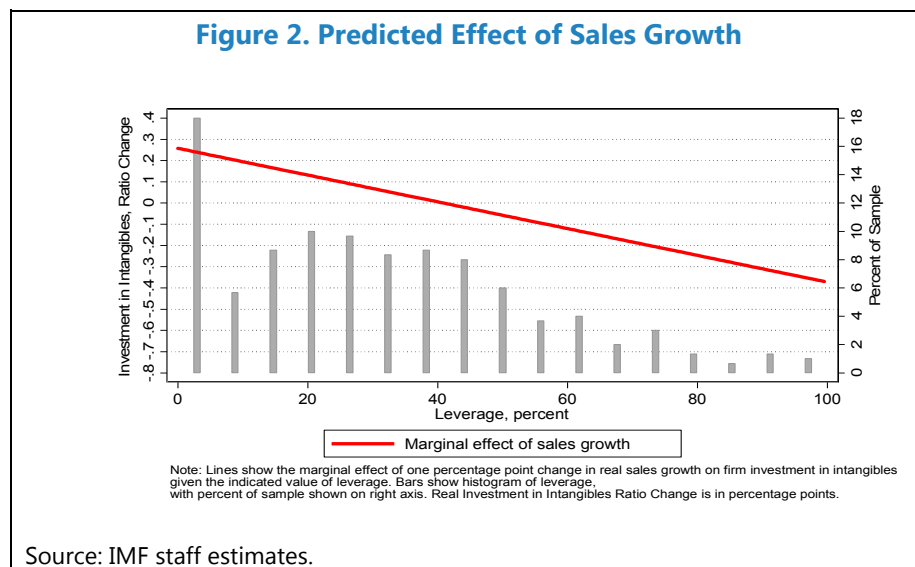
<sup>8</sup> The sample spans the years 2007-2013 and covers 192 firms (and about thousand observations) for which we have information on investment in intangible assets and other variables. Investment in intangible fixed assets is measured by the annual increase in the stock of intangible fixed assets over lagged stock of intangible fixed assets. We removed outliers in line with Cleary (1999). The cutoff values are 200 and -200 for investment/net fixed asset, 100 and -100 for real sales growth, and 100 and 0 for leverage.

sector in a given year. The latter set of fixed effects helps control for aggregate sectoral demand or policy-induced shocks, as well cross-sectional dependence between firms.



**12. The results show that weaker firm balance sheets are associated with lower investment in innovation.** The effect of elevated firm leverage on investment in innovation is negative and statistically significant. On average, net investment in intangible fixed assets is 6 percentage points lower for a 10 percentage points *exogenous* rise in leverage. The findings that pre-existing leverage has a negative effect on investment is consistent with the previous empirical literature (such as IMF, 2016; Kalemi-Ozcan and others, 2015, and Lang and others, 1996), although the estimated effect here on intangible fixed assets is much larger in absolute terms. The results are robust to controlling for the maturity structure of firm debt (measured here by the share of long-term debt in total debt). Similar qualitative results are found when we replace the leverage ratio by the indicator of firm financial stress (the ICR). The results show (despite a much smaller regression sample) that a higher ICR (lower stress) is associated with a higher investment in intangibles.

**13. Higher leverage and lower debt servicing capacity are associated with a lower investment response to demand (real sales growth).** The chart below shows how the marginal effect of sales growth depends on the firm's leverage: high leverage weakens the firm's investment response to demand growth. Going from the 25<sup>th</sup> percentile to the 90<sup>th</sup> percentile of firm leverage (from about 13 percent to 66 percent leverage) is associated with a 3.5 percentage points lower investment response to a 10 percentage point rise in sales growth. We also find that lower financial stress (higher ICR) helps increase the reaction of investment to positive demand shocks. Both of these findings are consistent with the financial constraints hypothesis and previous work (IMF, 2016); more highly leveraged firms are less able to respond to demand shocks.



## D. Conclusions

**14. Maltese SMEs, particularly in construction and manufacturing, appear vulnerable to shocks.** In this paper, we showed that (i) smaller firms are in general heavily leveraged, less profitable and less resilient to shocks; (ii) vulnerabilities in the construction and manufacturing are elevated. The analysis also indicates that higher leverage weighs on firms' investment (in innovation) and makes investment less responsive to positive demand shocks. Policies to promote speedier restructuring of corporate balance sheets for distressed, but viable firms, while facilitating a fast exit for unviable cases would enhance the resilience of SMEs to shocks.

**15. Supporting firm growth, including through enhanced innovation activity, would also strengthen resilience to shocks.** The results indicate that innovation is significantly lower among SMEs, reflecting in part their weak financial health. Strengthening the balance sheets of weak, but viable, firms, while expanding SMEs' non-bank and equity financing options would help ease financing constraints for R&D activities. Additional ways to boost innovation could include enhanced collaboration with the academia, higher internationalization of SMEs, and greater direct public sector's support, particularly given that existing tax incentives are less effective for small firms that lack sufficient funds to invest in R&D.

## References

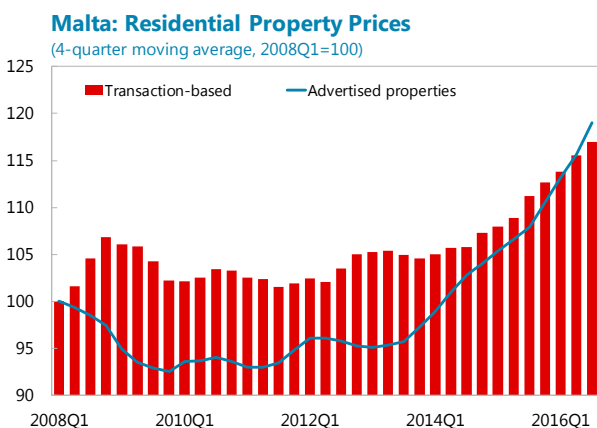
- Central Bank of Malta, 2013. ECB Estimation of Sensitivity to House-Price and Interest Rate Shocks. Report published in the Quarterly Review 2013:3.
- Cleary, S., 1999. The Relationship between Firm Investment and Financial Status. *Journal of Finance*, 54(2), pp. 673-692.
- Grima, M., Vella, K., 2014. Corporate Financing in Malta, Economic Policy Department, Ministry of Finance.
- IMF, 2014. Malta: 2014 Article IV Consultation-Staff Report, International Monetary Fund, Washington, D.C.
- IMF, 2016. Investment, Firm Size, and the Corporate Debt Burden: Firm-Level Analysis of the Euro Area, in *Euro Area Policies Selected Issues*, IMF Country Report No. 16/220.
- Kalemli-Özcan, Ş., Laeven, L., and Moreno, D., 2015. Debt Overhang in Europe: Evidence from Firm-Bank-Sovereign Linkages. Manuscript.
- Lang, L., Ofek, E., and Stulz, R., 1996. Leverage, Investment, and Firm Growth. *Journal of Financial Economics*, 40(1), pp. 3-29.

## HOUSING SECTOR: POTENTIAL VULNERABILITIES<sup>1</sup>

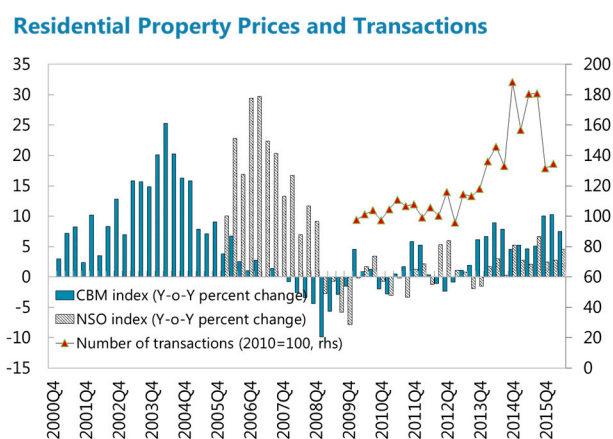
This note assesses vulnerabilities and risks associated with the property market in Malta. The data do not appear to point to a house price misalignment at present, yet a combination of demand and supply factors are likely to exert sustained pressures on house prices going forward. Moreover, elevated households' indebtedness, combined with high and increasing bank exposure to property market, pose vulnerabilities to a potential negative house price shock. This calls for: (i) deploying targeted macro prudential tools as precautionary measures and maintaining prudent lending standards; (ii) closing data gaps to calibrate such tools and ensure continued in-depth monitoring of risks, (iii) carefully reviewing fiscal incentives related to property market; and (iv) alleviating financing constraints in construction sector to enhance supply response to price signals.

### A. Introduction

**1. Residential property prices have showed a positive momentum recently.** Following a correction in the early stages of the crisis, and some stagnation afterwards, property prices have picked up in 2014-16, surpassing their pre-crisis levels. The transaction-based price index increased by a cumulative 20 percent since 2011, while the Central Bank's advertised property price index, a leading indicator for future price movements, registered an even sharper increase of about 30 percent in this period. The housing market recovery was accompanied by a 7 percent hike in rental prices in 2014-16 and a significant increase in the volume of transactions.



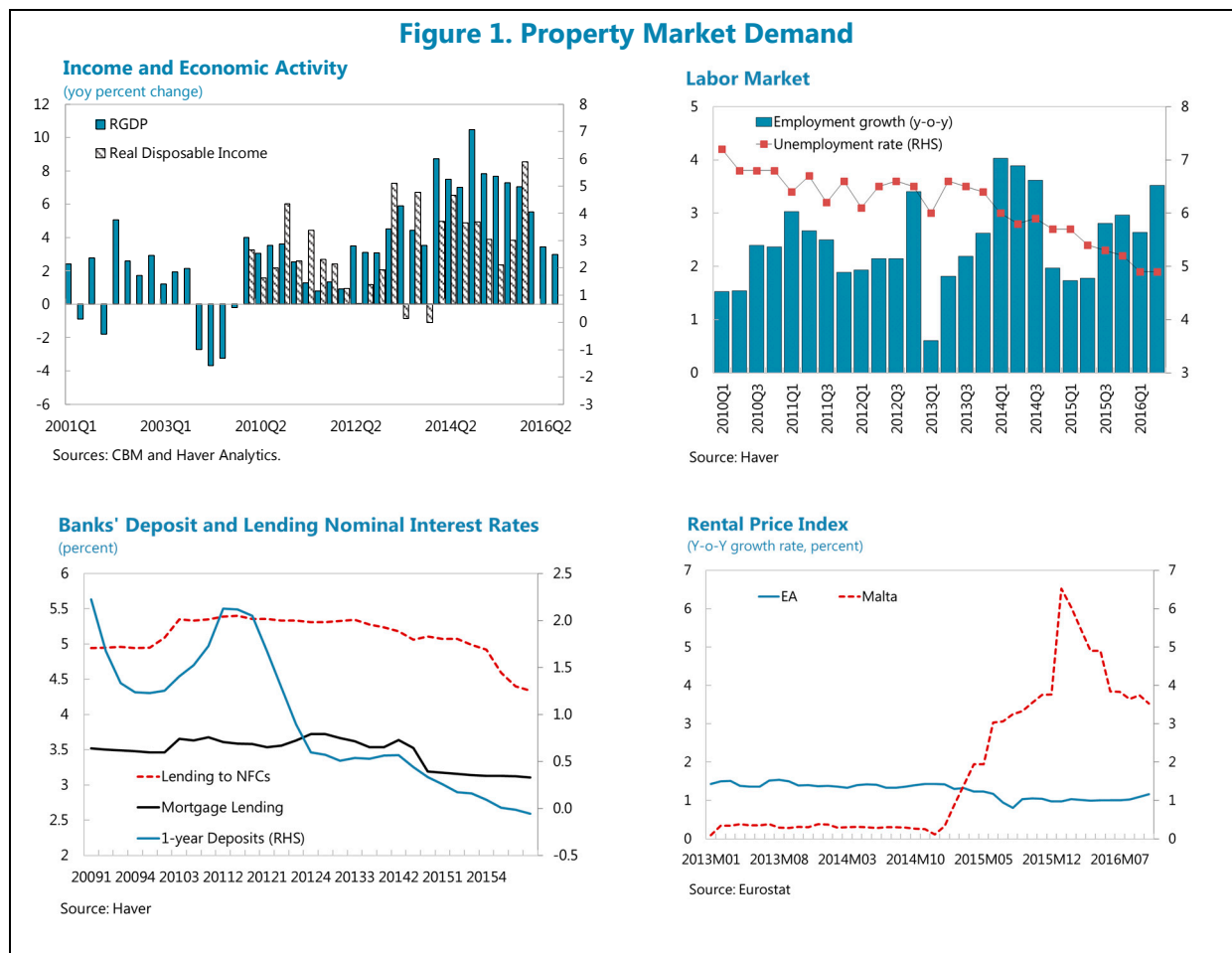
Sources: Central Bank of Malta, Eurostat, and IMF staff's calculations.



Sources: CBM, NSO

<sup>1</sup> Prepared by Nina Budina and Federico Grinberg (EUR).

**2. Several push factors have stimulated the demand for houses.** Strong employment growth, higher real disposable income, and subdued inflation, have increased households purchasing power and stimulated the housing market. Demand for properties was also supported by the low interest rate environment, the robust mortgage lending growth and the large influx of foreign workers.<sup>2</sup> Fiscal measures such as the Individual Investor Program (IIP), the scheme for first time home buyers, and lower withholding tax on rental income may have added further to demand pressures.<sup>3, 4</sup>



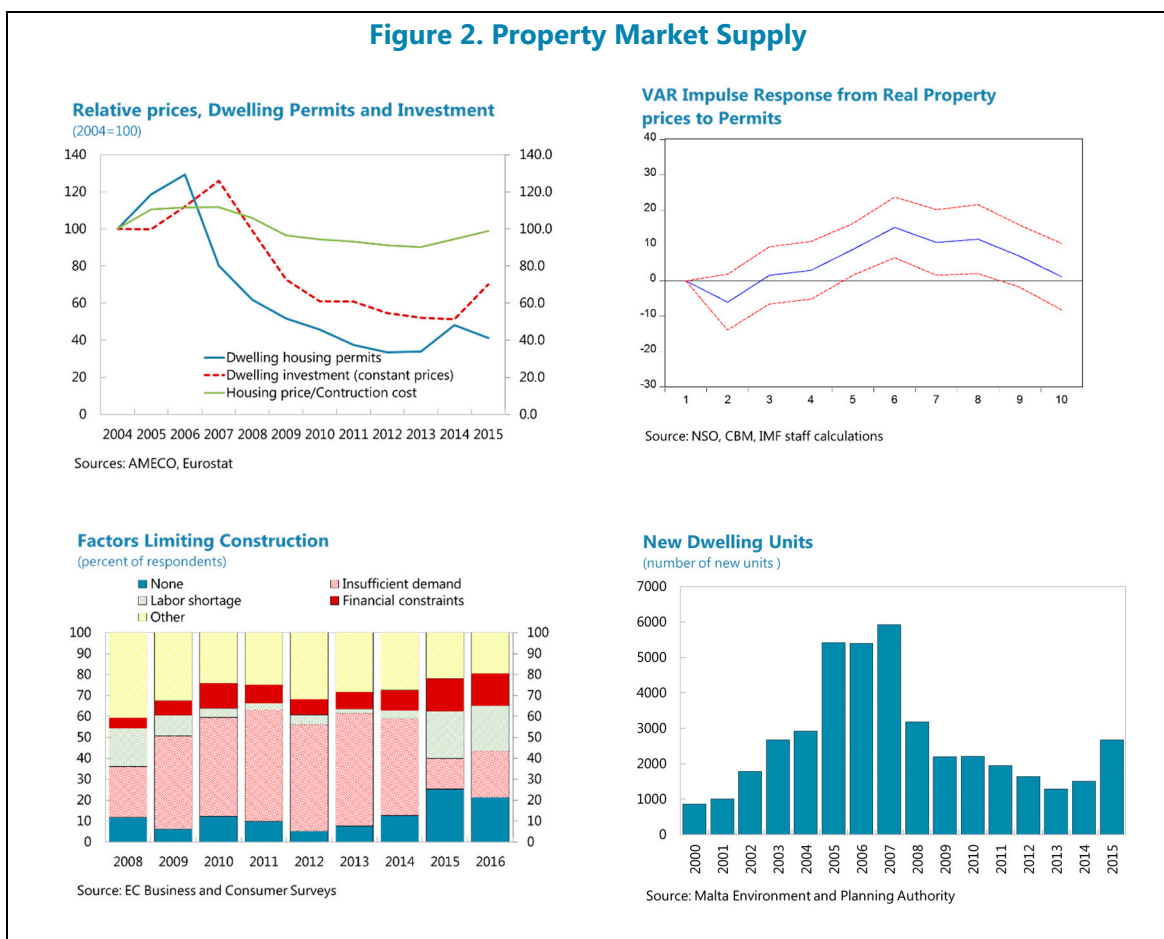
<sup>2</sup> The large foreign workers' inflows put pressure on the property market mostly by reducing the available stock of units for purchase. The share of purchased properties by foreigners appears to be relatively low (between 2 and 4 percent). This data, however, corresponds only to transactions made with domestic banking loans and thus it could underestimate the impact of foreigners' purchases.

<sup>3</sup> The IIP grants Maltese citizenship to individuals that make a contribution of €650,000. Moreover, it is required to purchase a property exceeding €350,000, or to lease a property for more than €16,000 a year.

<sup>4</sup> This exempts first-time buyers of the stamp duty on the first €150,000 of their new property.



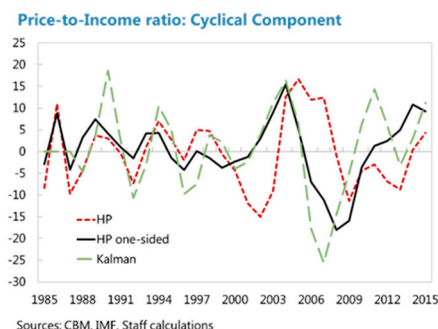
**3. Sluggish supply response further adds to price pressures.** Weak firm balance sheets and sizeable legacy NPLs of the construction sector (about 45 percent of the construction sector's loans in 2016Q1) continued to weigh on construction activity, hindering the capacity of the sector to respond to price signals. Indeed, in spite of rising house prices in excess of construction costs over the last few years, dwelling investment and construction of new units remained relatively weak. Moreover, dwelling permits, which reflect ongoing construction plans, were modest compared to the pre-crisis period. An impulse response from a VAR model, which largely relies on the post-crisis sample, corroborates the lengthy response of construction permits to housing price increases.<sup>5</sup> As financing conditions remain tight, some construction builders are bypassing the traditional bank financing practices and are using households deposits to finance new construction.



<sup>5</sup> A VAR model estimated on the quarterly differences of real property prices and construction permits suggests that it takes about 1½ year for permits to respond to house price increase. This simple analysis implies that finished constructions would provide additional housing supply after that time span. Nevertheless, anecdotal evidence suggests that at least in part, this might be explained by the accumulated stock of permits prior to the global financial crisis.

#### 4. Against this background, this study assesses vulnerabilities and risks for households and banks that emanate from the property market dynamics.

The approach involves using a range of tools developed by the IMF Research Department to assess (i) the degree of house price misalignment relative to fundamentals; (ii) vulnerabilities stemming from household indebtedness, including its distribution; and (iii) mortgage market vulnerabilities.<sup>6</sup> The note also considers some policy measures to stem potential price misalignments in the future and to reduce vulnerabilities of the economy to potential negative house price shocks.

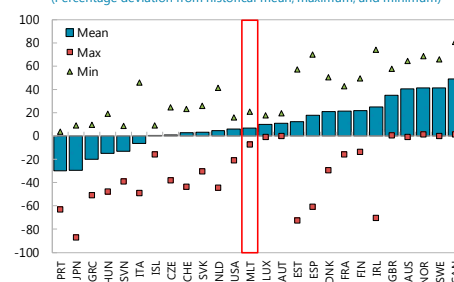


## B. Dynamics of House Prices and Fundamentals

#### 5. We use both parametric and non-parametric methods to evaluate Malta's housing prices.

A combination of a time-series decomposition, model-based approach, and simple benchmarking of Malta to peers has been used to assess house prices. In particular, we use a non-parametric analysis such as simple de-trending methods to assess the cyclical component of the price-to-income ratio (PIR) and price-to-rent ratio (PRR), and complement it with a regression model with an error-correction component where quarterly house price growth is regressed on fundamentals proxies (Igan and Loungani, 2012).

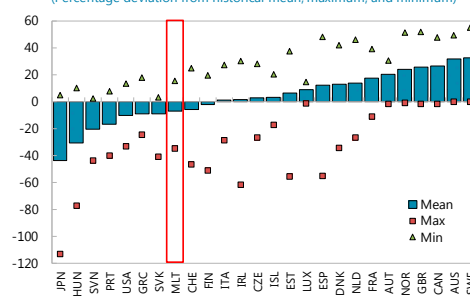
**Price-to-Rent Ratio, 2015Q4**  
(Percentage deviation from historical mean, maximum, and minimum)



#### 6. From a long run perspective, the property market is in a positive cyclical stance, although both PRR and PIR do not show significant deviation from their long-run averages.

Results from the one-sided HP filter and Kalman decompositions show a strong cyclical upturn in the price-to-income ratio while the standard HP filter shows a more moderate cyclical stance.<sup>7</sup> Nevertheless, both PIR and PRR do not show significant deviations from their long-run averages: the PRR exceeded its long-term average in 2015q4 by 6.6 percent, yet it remained below its maximum level while the PIR stood at 7.3 percent below its long-run average. In both ratios, Malta does not stand out compared to its European peers.<sup>8</sup>

**Price-to-Income Ratio, 2015Q4**  
(Percentage deviation from historical mean, maximum, and minimum)



<sup>6</sup> See IMF, 2011 and IMF, 2012 for a fuller discussion on the methodology for assessing vulnerabilities to house prices.

<sup>7</sup> Similar conclusions apply for the cyclical analysis of the PRR.

<sup>8</sup> The apparent divergence between the cyclical analysis and the comparison with historical averages is due to the fact that the historical average is affected by the 2007 peak. By estimating a stochastic trend with HP and Kalman filters, and using it to obtain the cyclical component of the ratio, that effect is partly removed.

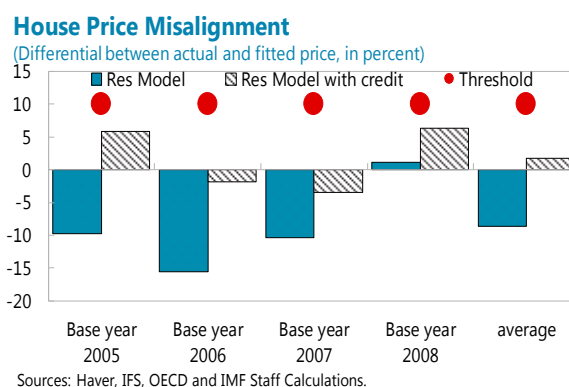
### 7. The error correction model does not appear to point to a house price misalignment.

The explanatory variables include demand-side factors such as changes in income per capita, short and long-term interest rates, credit growth, growth in equity prices, and growth in the fraction of working age population. The long-term equilibrium relationship is measured by using house prices to income ratio, which captures affordability.<sup>9</sup> The supply side, proxied by construction costs, is assumed to be

relatively inelastic in the short run but has an impact on house prices in the long run. The percentage price level gap, unexplained by the fundamentals has been negative or very small positive, but well below the 10 percent threshold, when using the pre-crisis years as a base for the construction of the fitted house price level. This suggests that there is no evidence of house price misalignment.

Nevertheless, the house price gap is closing

faster, when using the crisis year, 2008q4, as a base for estimating the fitted house price level.<sup>10</sup>



## C. Households Indebtedness and Bank's Exposure to House Price Shocks

### Banks

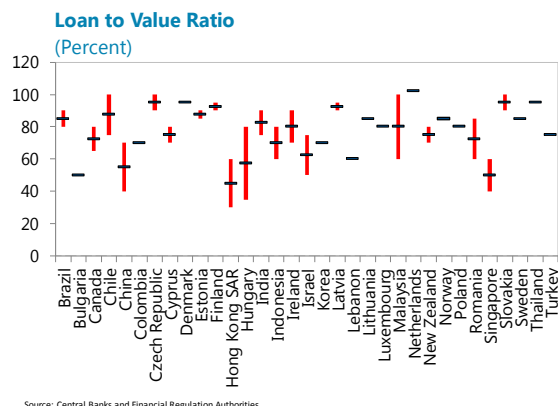
**8. Domestic banks' exposure to mortgages and house price swings is high and gradually increasing.** Despite the overall subdued credit growth to private sector (3.7 percent in 2016), mortgages increased strongly at 7½ percent y/y, more than compensating the decline in credit to NFCs (-4.1 percent). The protracted divergence between NFC and mortgage loans increased the share of the latter in total lending to the private sector to nearly half in 2016 from one-third at end-2010. The exposure to the property market is amplified by the outstanding credit to the construction and real estate activities, in which a significant part of it remains impaired. This high concentration of banks' loan portfolio makes the banking system more exposed to house price swings.

<sup>9</sup> Income is proxied by GDP per capita.

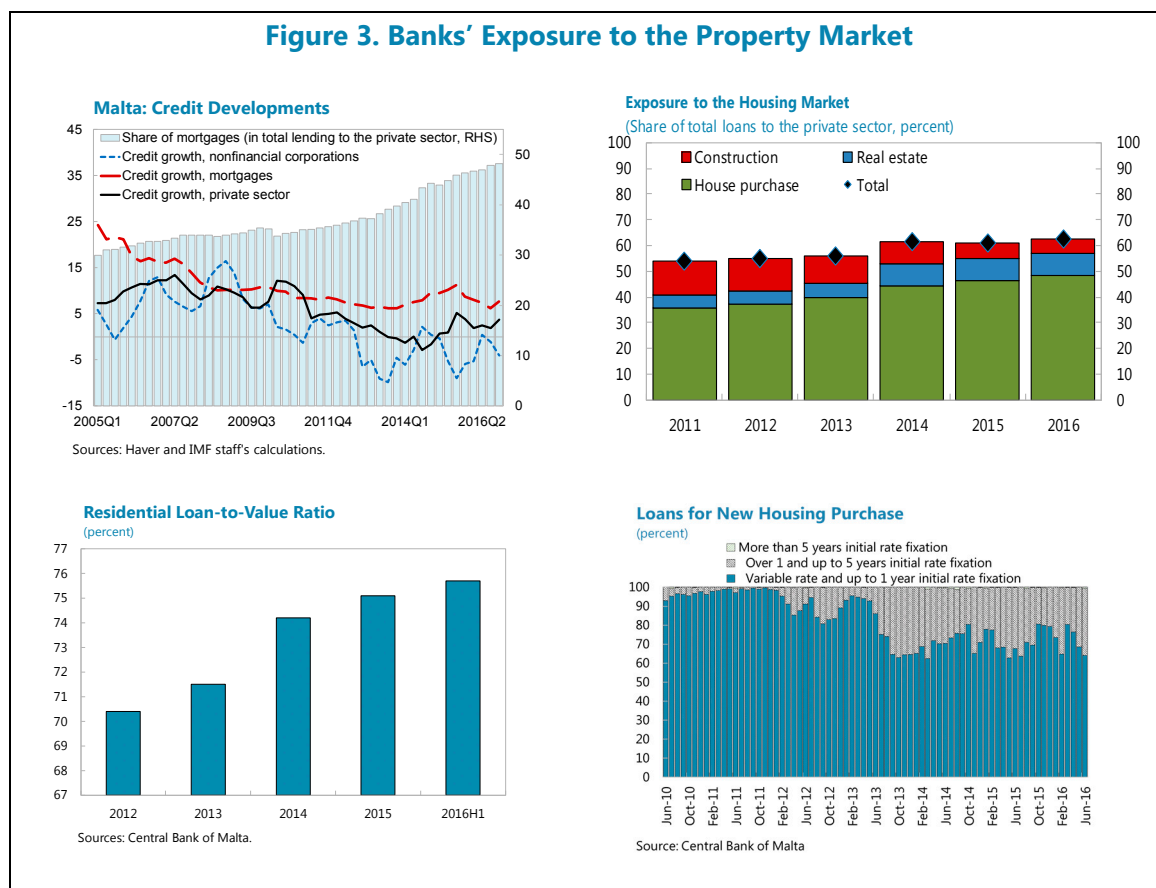
<sup>10</sup> Note that including the credit growth as an independent variable shows a small positive gap when using 2005 year as a base. Nevertheless, when average over the 4 years, the price gap is still very small (around 2 percent), still below the threshold of 10 percent, implying no evidence for house price misalignment.

## 9. Mortgages' characteristics could be a source of vulnerabilities.

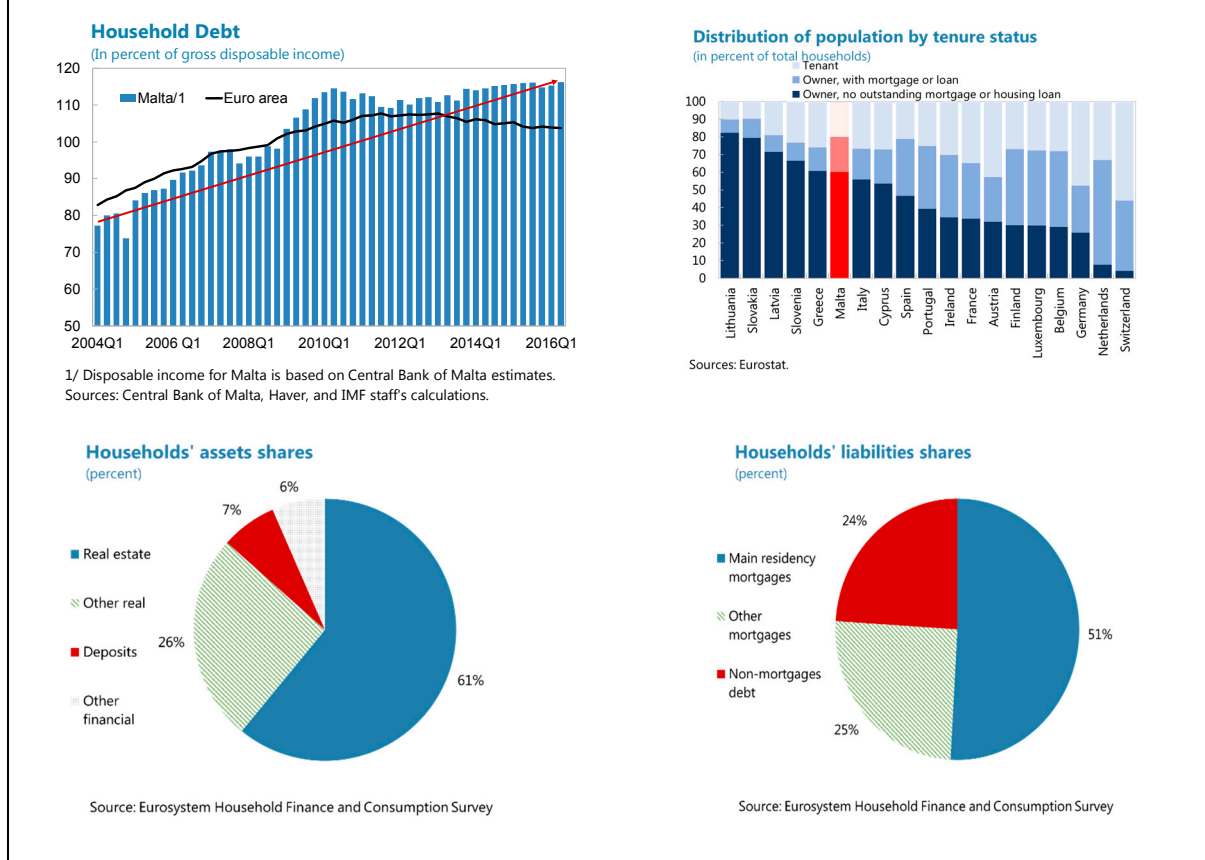
- The average loan-to-value ratio for residential properties increased by about 5 percentage points to 75 percent in the last four years. While the LTV ratio does not appear high compared to peers, continued deleveraging of the NFC sector runs the risk that banks could further ease mortgage lending standards to expand their loan portfolio. Moreover, lack of disaggregated data prevents a more granular assessment of whether there are pockets of highly vulnerable mortgage borrowers (i.e., households with high LTVs).<sup>11</sup>



**Figure 3. Banks' Exposure to the Property Market**



<sup>11</sup> The authorities are in the process of gathering bank-by-bank data on LTVs, LTIs and lending by segment (principal residence, secondary residence, buy to let) for the last five years.

**Figure 4. Households' Exposure to the Property Market**

- The share of mortgages with variable interest rates is high with more than 60 percent of new mortgages extended at variable interest rates. This implies that changes in the banks' funding costs could be passed on to households. Nevertheless, the practice of Maltese banks of extending loan maturities instead of increasing monthly payments in response to interest rate increases has been an important mitigating factor in the past.<sup>12</sup>

## Households

**10. Households' debt is high and rising though, on aggregate, they have significant financial wealth.** Malta's household indebtedness—as measured by household debt-to-gross disposable income ratio—is high compared to European peers, including to some economies from Southern Europe that suffered a severe consequences of private debt overhang. Moreover, the increase in households' debt as a share of disposable income was among the strongest in

<sup>12</sup> While the repayments' present value would increase, households' liquidity and interest rate burden could potentially remain unaffected.

Malta, compared to peers. Nevertheless, sizeable household financial wealth (200 percent of GDP in 2015) and historically very low NPLs on mortgage debt are important mitigating factors.

**11. Mortgages are disproportionately concentrated in a small fraction of households.**

While mortgages on main residency represent more than half of total households' liabilities, only 20 percent of total households have an outstanding loan or mortgages on their primary residency. Moreover, financial leverage—household liabilities to financial assets—is relatively high for mortgage owners with lower income. This implies that a small group of owners is heavily exposed to swings in house prices and in borrowing costs.<sup>13</sup>

**Table 1. Households' Balance Sheet Indicators by Income Bracket**

Income brackets (euro)	LTI (%)	DSTI (%)	LTV (%)	Loans share
less than 12700	528.9	27	60.6	5.3
12701-21200	539.7	27.3	74.5	17.9
21201-28700	469.6	25	79	19.3
28701-60000	443.5	25.1	76.3	38.2
60000 and over	326.5	21.5	73.6	19.3

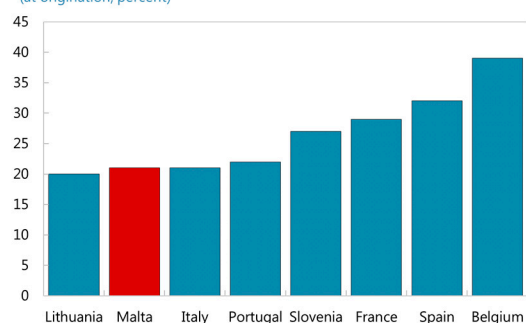
Source: Central Bank of Malta

**12. Most households' assets are heavily concentrated in illiquid real assets.** In the event of a reversal in property prices dynamics, all households would experience indirect effects of changes in the property market conditions on the economy (through employment creation and activity). Owners without mortgages would also be affected by a negative wealth shock while the net worth of owners that have outstanding loans could turn negative and have their properties "under water" as their mortgages could have a higher value than their properties.

**13. Households' balance sheets are not overly stretched, but could be sensitive to changes in the macroeconomic conditions.**

Maltese households have an average debt service-to-income ratio (DTSI)<sup>14</sup> that is moderate when compared to peers. Moreover, survey data does not show significant vulnerabilities on average indicators for different households' income brackets. This strength, however, largely reflects the accommodative monetary policy cycle. The high share of variable rate mortgages may expose households to potential deteriorations in DTSI in the event of increases in interest rates and reversal of income dynamics.

**Households' Debt Service-to-Income**  
(at origination, percent)



Source: ECB

**14. A reversal in property market could adversely affect economic activity through households.** In view of the high and increasing exposure of core domestic banks to the housing market, a sharp turnaround in housing prices could significantly weaken banks' financial health—

<sup>13</sup> As expected, younger cohorts tend to concentrate the highest debt burden, which declines over the working life of the borrower.

<sup>14</sup> Measured at origination.

particularly if it would be accompanied by broader economic slowdown and an increase in unemployment—and may result in a negative spiral of low lending and investment. The elevated households' debt as a share of disposable income (116 percent), together with the prevalence of variable-rate mortgages also point to potential vulnerabilities.

## D. Conclusions

**15. This note assesses vulnerabilities for households and banks from recent property price increases.** The data does not appear to point to house price misalignment, but a combination of demand and supply factors are likely to exert sustained pressures on house prices. Moreover, while households' balance sheets are not overly stretched at the current juncture, rising household indebtedness together with the prevalence of variable rate mortgages pose risks. A potential sharp house price drop could also impact banks' capacity to lend, given the increasing concentration of mortgages in banks portfolios. However, high household financial wealth, relatively high share of home owners without mortgages, and low mortgage default rates are mitigating factors.

**16. Policies to address these vulnerabilities could help sustain Malta's resilience to shocks.** Specifically:

- *Considering to implement precautionary macro-prudential tools and maintain prudent lending standards.* A careful consideration should be given to deployment of targeted (precautionary) measures such as limits on loan-to-value and debt-to-income ratios to enhance the resilience of household and bank balance sheets to a possible future sharp housing price drop.
- *Closing data gaps to ensure that macro-prudential tools are well calibrated, and that risks are identified and addressed in a timely manner.*
- *Considering a careful review of the fiscal incentives related to property market.* Better targeting the support for first time home buyers, and reducing tax incentives for buy-to-let investors would help mitigate house price pressures.
- *Addressing supply-side constraints.* Alleviating financing constraints in the construction sector to increase responsiveness of supply to price signals would require speedier restructuring of corporate balance sheets to unleash new lending for construction activities.

## References

Central Bank of Malta, 2013. ECB Estimation of Sensitivity to House-Price and Interest Rate Shocks. Report published in the Quarterly Review 2013:3.

Central Bank of Malta, 2016. Box 5: Residential Property Prices, Quarterly Review 2016:2.

Central Bank of Malta, 2016. Property price misalignment with fundamentals in Malta. Report published in the Quarterly Review 2013:3.

Cerutti, D., and G. Dell'Ariccia, 2012, "Housing Finance and Real-Estate Booms: A Cross-Country Perspective.", IMF Staff Discussion Note SDN/15/12.

Crowe, C., G. Dell'Ariccia, D. Igan, and P. Rabanal, 2011, "Policies for Macro-Financial Stability: Options to Deal with Real Estate Booms", IMF Staff Discussion Note SDN/02/11.



# A FINANCIAL CONDITIONS INDEX FOR MALTA<sup>1</sup>

*This paper develops a Financial Conditions Index (FCI) for Malta using a Principal Components Analysis (PCA). The constructed FCI shows an improvement in financial conditions in the post-crisis period on the back of more favorable domestic and external conditions. In addition, the FCI, which was found to have a high correlation with future economic activity and a significant impact on the dynamics of household credit, suggests that the current favorable financial conditions are likely to support economic growth in the near term.*

## A. Introduction

**1. A Financial Conditions Index (FCI) is a useful financial surveillance and forecasting tool.** It is often used as a financial surveillance tool as it conveniently summarizes the bulk of the informational content of an array of financial and economic indicators.<sup>2</sup> As financial conditions are known to have an important influence on business cycles because they reflect markets' expectations regarding future economic developments, an FCI can be used to improve the predictive power of econometric models for GDP growth and other economic indicators.<sup>3</sup>

**2. In the absence of theoretical guidance, both judgment and parametric estimation are used to construct an FCI.** Judgment is widely used to select the components of an FCI and assign their relative weights when the FCI is predominately used as a monitoring tool. A regression-based FCI and a principal component analysis (PCA) are the two parametric approaches that are commonly used in the literature. In the first approach, the weights of each financial indicator are assigned according to the estimated impact on real GDP growth in a vector autoregressive (VAR) or structural macroeconomic models. In the second approach, the FCI is based on a common factor, which is extracted from a group of financial indicators and captures the greatest common variation among them.

**3. In this paper we use a PCA method to evaluate the financial conditions in Malta.** The advantage of this method is its practicality as it allows one to quickly collapse a large set of financial variables into a single indicator.<sup>4</sup> However, as a purely statistical tool, a PCA has a major disadvantage because it assumes that the indicators with the greatest variability have the biggest economic significance. Therefore, and like any other approaches, the construction of the index requires judgement regarding the suitability of the indicators that are included.

---

<sup>1</sup> Prepared by Federico Grinberg.

<sup>2</sup> See Manning and others (2015) as some examples of IMF surveillance done using FCI analysis.

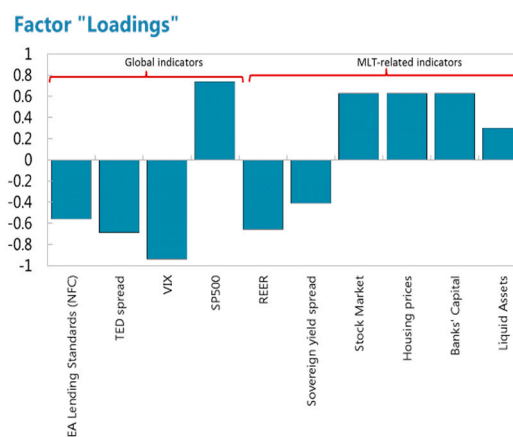
<sup>3</sup> English et al. (2005), Swiston (2008), and Hatzius et al. (2010) show that FCIs are highly correlated with GDP and have a strong predictive power for future economic activity.

<sup>4</sup> See Angelelopoulou and others (2013).

## B. Constructing a Financial Conditions Index for Malta

**4. A PCA-based FCI for Malta is constructed based on asset prices, interest rates, exchange rates, and global risk indicators.** We began with a fairly large data set that included various measures of consumer and asset prices, interest rates, exchange rates, risk and banking sector indicators, balance sheet indicators, and external sector indicators. We reduced the original set of quarterly indicators using the following criteria: (1) the time span should cover at least the last 10 years to capture the last two episodes of financial stress; (2) the sign corresponding to an indicator entering the first principle component has to be economically meaningful; (3) the relative weight of a standardized component in the FCI has to be greater than 10 percent.

**5. The final set of FCI components includes external and domestic variables.** Malta is a small open economy, and thus changes in the international environment can significantly affect financial conditions that the economy faces. Therefore, the FCI includes external indicators such as the Euro Area (EA) lending standards for non-financial corporates, the Ted-spread<sup>5</sup> (which measures global credit risk), Chicago Board Options Exchange Volatility Index (VIX), and the Standard and Poor's 500. Domestic variables that reflect Malta's financial conditions are the real effective exchange (GDP deflator based), the 10-year sovereign yield spread with Germany, stock market prices, and housing prices (Central Bank of Malta's index of advertised prices), and domestic banks' capital and liquid assets ratios.<sup>6</sup> All variables are demeaned, so the resulting FCI is centered around zero. All chosen indicators have a meaningful loading (of at least 40 percent).



## C. Results

**6. The results show that financial conditions have been favorable, particularly since end-2012.** Financial conditions were quite supportive before the crisis. They started to deteriorate in 2007, mainly due to negative contribution from domestic variables (especially the stock market prices). As the international crisis unfolded in 2008, both external and domestic variables had a

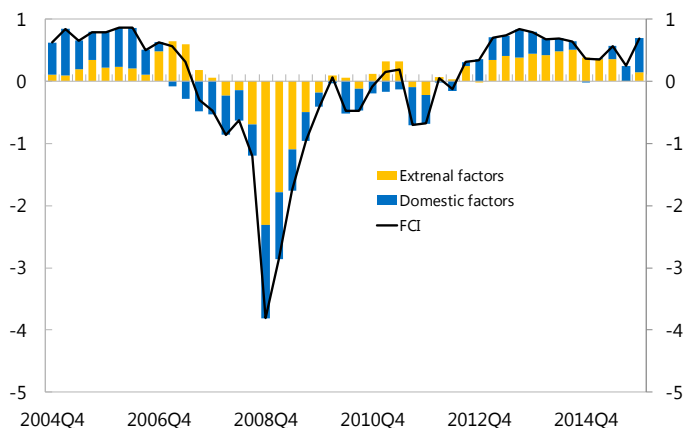
<sup>5</sup> The Ted-spread is constructed as the difference between the London interbank interest rate (Libor) and the US 3-month T-bill yield.

<sup>6</sup> A wider range of domestic variables were examined; however, they were eventually dropped due to weak co-movement with the common factor or had the opposite sign that one would expect.

negative contribution to the FCI, but the contractionary impact turned positive in 2013 as both global and domestic conditions improved.<sup>7</sup> Domestic factors were supported by the buoyancy in Malta’s stock market, the strong housing market momentum, the continued compression of the sovereign spread, and the REER dynamics. The improved external conditions also supported the financial conditions since 2012, though the increased financial volatility and the slower growth in US stock market prices posed some headwinds at end-2015.

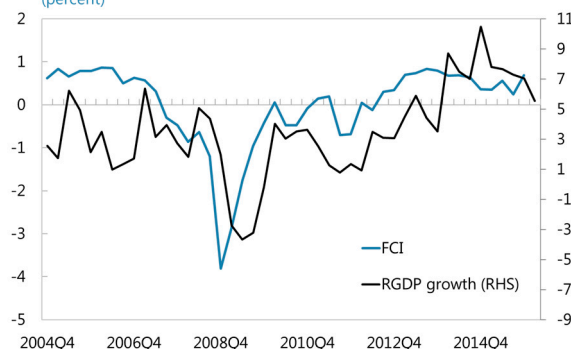
**7. The FCI is strongly correlated with GDP growth.** Both visual inspection and simple correlations show that the FCI is highly correlated with future GDP growth (up to 5-6 quarters) over the entire sample. The high correlation between the FCI and GDP growth in 2006-14, is in part explained by large share of tradable sectors in the economy, which are susceptible to changes in external financial conditions and the exchange rate. The sizable financial sector and relatively high stock of private sector’s financial assets and liabilities also increase the sensitivity of the economy to changes in domestic and external financial conditions.

Contributions to FCI



Sources: IMF Staff Calculations

GDP Growth and FCI (percent)



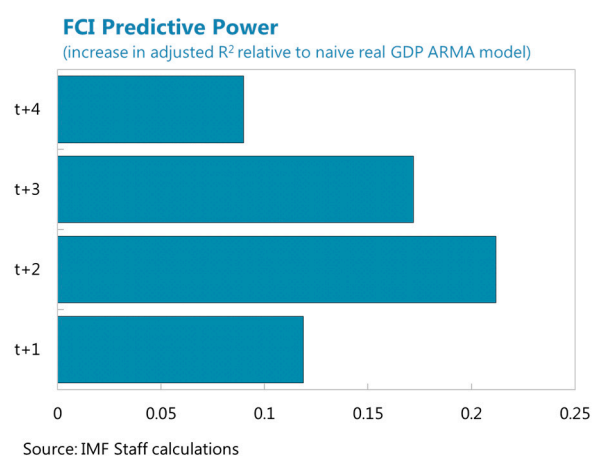
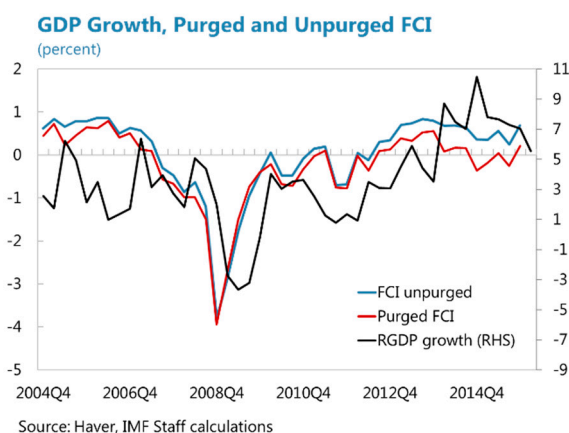
Source: Haver, IMF Staff calculations

FCI Correlation with Real GDP Growth (y-o-y)			
<i>t</i> +1	<i>t</i> +2	<i>t</i> +3	<i>t</i> +4
0.485	0.616	0.586	0.494
Sample: 2004Q4 2015Q4			

<sup>7</sup> The Central Bank of Malta’s FCI also suggests that conditions have improved since 2013, though it shows that financial conditions remained less favorable compared to the pre-crisis period.

## D. Forecasting Properties of the FCI

**8. The high correlation of the FCI with real activity may suggest that it could serve as a useful tool to assess future real GDP developments.** To address concerns about causality from economic activity to financial conditions, we regress the FCI on GDP growth to remove contemporaneous effects. The resulting residuals are used as a “purged” FCI. The trajectory of the purged FCI is broadly similar to that of the unpurged indicator. The estimations of the forecasting properties of the “purged” FCI show that it has meaningful predictive power. Econometric tests show that there is causality (in the sense of Granger (1988)) at 2 and 4 lags from the FCI to GDP growth, but not the other way around. Last, the forecasting power of a simple ARMA model of GDP growth is increased significantly by augmenting it with the FCI at different lags.



**9. Changes in financial conditions have a positive impact on credit.** Estimates from a three-variable VAR with purged FCI, de-trended real credit to households, and real GDP growth show a positive and significant effect of the FCI on real credit and growth.<sup>8</sup> In particular, the results suggest that an improvement in overall financial conditions have a direct effect on GDP growth within four quarters while contributing to the expansion of credit to households within two quarters.<sup>9</sup> These results suggest that part of the positive effect of financial conditions on economic activity is taking place through the credit channel.

Pairwise Granger Causality Tests		
Null Hypothesis:	P-value	
	2	4
Lags		
FCI does not Granger Cause RGDP	0.003	0.028
RGDP does not Granger Cause FCI	0.819	0.463

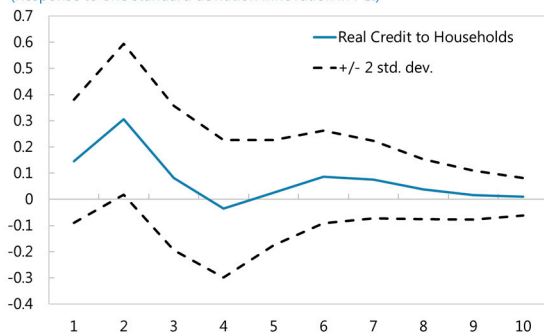
Sample: 2004Q1 2016Q1

<sup>8</sup> At a 5 percent significance level.

<sup>9</sup> Results on overall credit to the private sector are inconclusive, potentially reflecting the recent non-financial corporates deleveraging.

### Impulse Response Function

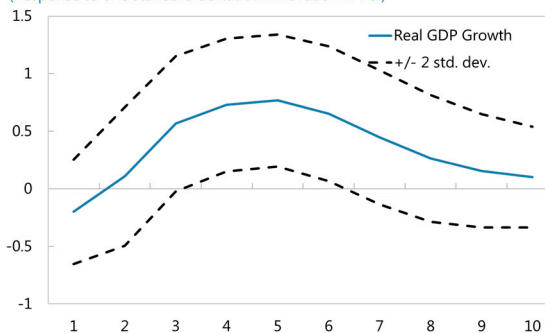
(Response to one standard deviation innovation in FCI)



Source: IMF Staff Calculations

### Impulse Response Function

(Response to one standard deviation innovation in FCI)



Source: IMF Staff Calculations

## E. Conclusions

**17. This paper develops an FCI for Malta.** The analysis extracts the FCI using PCA approach, which identifies an unobserved common factor from a group of external and domestic financial indicators. The FCI indicates that the financial conditions have improved significantly since 2013 on the back of more favorable external and domestic conditions, though domestic factors have become more dominant recently. Moreover, the FCI, which was found to have a high correlation with future economic activity and a significant impact on the dynamics of household credit, suggests that the current favorable financial conditions are likely to support economic growth in the near term.

## References

Angelopoulou, E., Balfoussia, H., and Gibson, H. (2013), "Building a Financial Conditions Index for the Euro Area and Selected Euro Area Countries: What Does It Tell Us About the Crisis?" European Central Bank Working Paper No. 1541.

English, W., Tsatsaronis, K., and Zoli, E. (2005), "Assessing the Predictive Power of Measures of Financial Conditions for Macroeconomic Variables," BIS Papers No. 22.

Granger, C. (1988) "Some recent development in a concept of causality." *Journal of econometrics* 39.1 (1988): 199-211.

Hatzius, J., Hooper, P., Mishkin, F., Schoenholtz, K., and Watson, M. (2010), "Financial Conditions Indexes: A Fresh Look after the Financial Crisis," National Bureau of Economic Research Working Paper No. 16150.

Manning, J. and Shamloo, M. (2015), "A Financial Conditions Index for Greece", IMF Working Paper No. 15/220.

Swiston, A. (2008), "A U.S. Financial Conditions Index: Putting Credit Where Credit is Due," IMF Working Paper No. 08/161.