

Malta: Selected Issues



MALTA

SELECTED ISSUES

January 2018

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CLOSING MALTA'S INFRASTRUCTURE GAP¹

Pressure on Malta's public infrastructure has mounted with rapid economic growth and rising immigration. Infrastructure gaps vis-à-vis other EU countries are most striking in road and energy networks, both in quality and quantity. This is reflected in an unparalleled gap in the approximated public capital stock. Long-term GDP benefits from increasing public investment are estimated to be substantial, ranging between 5¼ and 18¼ percent in net present value over 30 years. Malta's authorities have started to tackle these challenges by upgrading and diversifying the energy system and by launching a comprehensive transport strategy. These efforts go in the right direction and should be implemented in a budget-neutral manner to support a further decline in the public debt-to-GDP ratio.

A. Introduction

1. Malta's public infrastructure has come under strain. It has struggled to keep pace with the economy's rapid expansion and the associated influx of migrant workers. The relatively low public capital stock, estimated well below the EU average per capita, as well as subdued public investment rates may unduly constrain Malta's future growth potential. Infrastructure quantity and in quality show large gaps vis-à-vis the EU average on several fronts. Road congestion is the most notable example, as Maltese drivers waste far more hours on the road per year than in any other EU country. Thus, transportation costs, business productivity, and public health suffer (Attard et al., 2015).

2. The authorities are taking appropriate steps to address the infrastructure challenge. Energy infrastructure is being upgraded, and measures are underway to reduce fuel dependency, improve energy security, and increase diversification. An ambitious National Transport Strategy and Transport Master Plan, adopted in 2016, covers a wide range of road improvements. An estimated €700 million (around 6½ percent of projected 2017 GDP) investment over 7 years is foreseen for upgrading the road network.

3. The main findings of this paper are as follows:

- **Malta's infrastructure gap vis-à-vis the EU is large in some areas.** The estimated public capital stock is comparatively small and has been on a declining trend. The road network as well as power generation lag EU peers, both in term of physical structures and in perceived quality. The authorities have made steps in the right direction to address these gaps.
- **Increased public investment would generate significant long-term GDP gains.** Model simulations suggest that a temporary increase of one percentage point of GDP in public investment over 7 years in a budget-neutral manner would raise the net present value of GDP by around 5¼ percent of GDP over 30 years; a permanent increase of the same magnitude would boost that gain to 12 percent. Lifting public spending efficiency to the frontier would further drive up these GDP gains to around 8 percent and 18¼ percent, respectively.

¹ Prepared by Uwe Böwer. Support with model estimations by Ben Hunt and Keiko Honjo (both RES) is gratefully acknowledged. The paper benefited from useful comments and suggestions from participants of a workshop hosted by the Ministry of Finance.

- **Infrastructure financing should ideally be budget neutral.** Malta's fiscal position has improved considerably in recent years, yet further buildup of fiscal buffers is needed against possible adverse macroeconomic conditions. Therefore, reallocating public spending from current to capital expenditure, as well as making public investment more efficient would help boosting infrastructure. Improved use of EU funds, public-private partnerships linked with the new Malta Development Bank, as well as savings from spending reviews would facilitate a budget-neutral investment push.

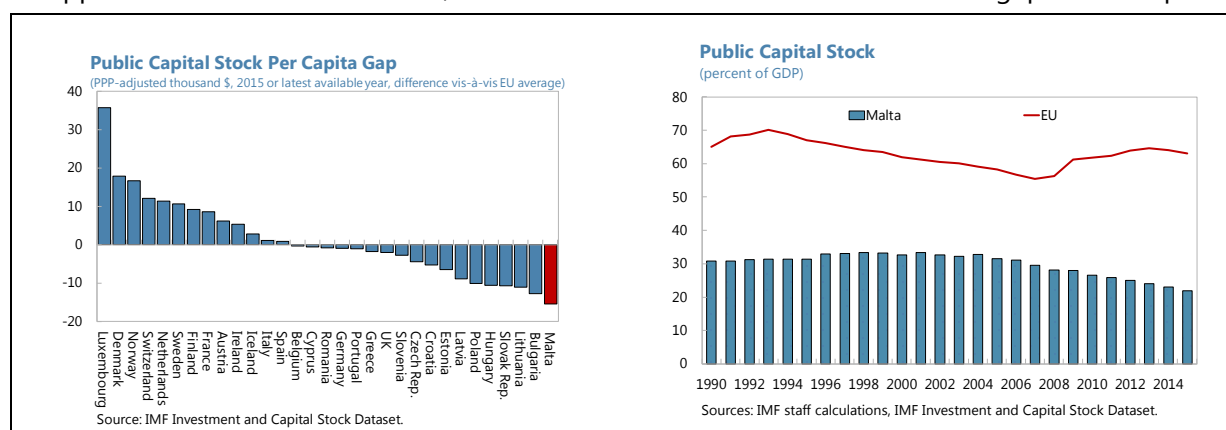
B. Public Infrastructure in Malta—the State of Play

4. Measuring public infrastructure across countries is not straightforward. The wide scope of infrastructure, difficulties in fair valuation, idiosyncratic geographical conditions, and subjective perceptions all make it challenging to compare infrastructure from one country to another. This section presents a variety of infrastructure measures, recognizing the shortcomings of each individual approach. Hence, instead of relying on one single measure, the analysis seeks to draw on the emerging big picture.

Value measures

5. Infrastructure is closely linked to the public capital stock but accurate valuation can be challenging. The lion's share of public capital typically consists of infrastructure, with the public sector acting as its main provider. While public capital can also contain machinery, inventories, etc., their share is relatively small. The same usually holds true for the share of privately provided infrastructure (IMF 2014; Bova et al. 2013). Approximating infrastructure by public capital, however, entails the risk of valuation errors due to uncertainty regarding quality levels and depreciation rates. Cognizant of these caveats, the IMF developed a [public capital database](#) adopting a cross-country consistent methodology for 170 countries, which relies on the perpetual inventory method and makes time-varying assumptions on depreciation rates and initial capital stocks.

6. Malta's public capital stock gap is the widest among EU countries. With around \$6,000 per capita and around 20 percent of GDP, Malta's public capital stock per capita is estimated as the smallest among EU countries, implying the widest negative gap. Unlike the EU average, which has halted its downward trend after the global financial crisis, Malta's public capital stock has been on a decline since the mid-2000s. Correspondingly, and despite temporary increases, public investment rates in Malta are among the lowest in the EU. Hence, if estimated public capital, with its acknowledged caveats, is used as an approximation for infrastructure, Malta has an obvious need to overcome its gaps with EU peers.



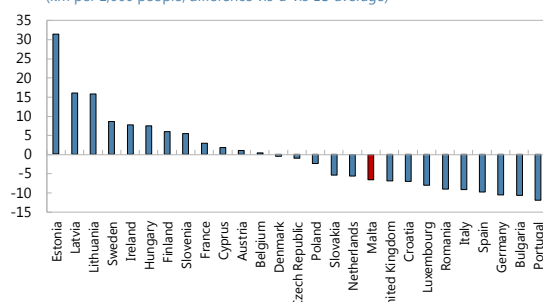
Physical measures

7. Measuring infrastructure in physical units offers a more objective view. Physical infrastructure can be compared across countries without making assumptions on valuation. It also offers a more nuanced view into different types of infrastructure. However, physical measures are silent about the quality of infrastructure, and it can be challenging to adjust the measures for country-specific differences like geographical conditions and population density. In the following, physical infrastructure gaps are expressed as the difference vis-à-vis the average of peer EU countries.

8. Malta's physical infrastructure gaps paint a mixed picture. Transport infrastructure shows a negative gap in terms of roads while the gap in air transport is positive. Malta's road network length per inhabitant is below the EU average. However, geographical features like Malta's small land surface and high population density need to be taken into account (see Box 1). In contrast, the number of air passengers per capita is well above-average in Malta, reflecting Malta's high share of tourists per inhabitant. Also, Malta's digital infrastructure is in fairly good shape, as both broadband and cellular phone subscriptions score above average. Electricity generation in Malta, however, is lagging most EU countries.²

Road Density Gap, 2015

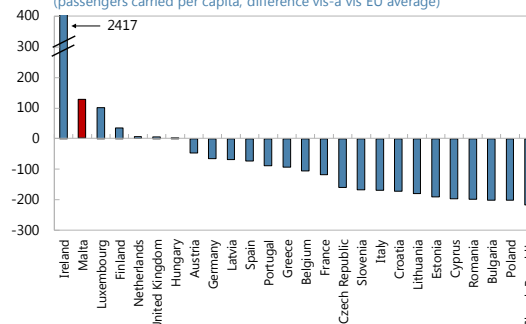
(km per 1,000 people, difference vis-à-vis EU average)



Source: European Commission, DESTATIS, Transport Malta; and IMF staff calculations.

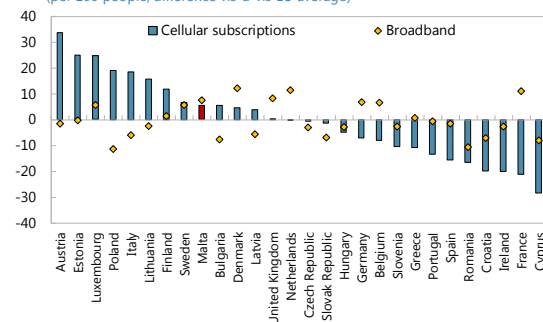
Air Transport Gap, 2016

(passengers carried per capita, difference vis-à-vis EU average)



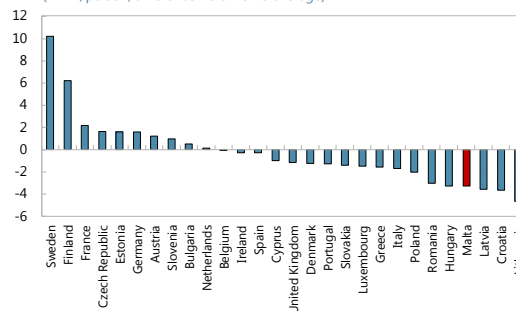
Source: WDI; and IMF staff calculations.

Broadband and Cellular Phone Subscription Gaps, 2015
(per 100 people, difference vis-à-vis EU average)



Source: WDI; and IMF staff calculations.

Electricity Generation Gap, 2015
(MWh/person, difference vis-à-vis EU average)



Source: Eurostat; and IMF staff calculations.

² Malta's electricity gap may be linked to the lower energy intensity of its largely service-based economy. The recent launch of an electricity connector with Sicily and the related boost in electricity imports, may also play a role.

Box 1. Addressing Malta's Road Transport and Energy Challenges

The condition of Malta's road network calls for a comprehensive revamp. Although the road network in Malta is one of the densest in the EU when measured per square kilometer of land surface, it is below EU average when measured per capita, taking Malta's high population density into account. The quality perception of road infrastructure is poor, lagging the EU average. Estimations by the European Commission's Joint Research Centre based on GPS data (EC 2016) indicate that congestion on Malta's roads remains a serious problem, reflecting in part Malta's high rates of car ownership.

Road congestion poses a significant economic burden. According to a study of the University of Malta, commissioned by the European Commission's representation in Malta, the external cost of road congestion is estimated at €118 million in 2012 (Attard et al., 2015). Adding the costs of accidents, air pollution, climate change and noise, the overall external cost of transport adds up to €274 million in the same year, equal to almost 4 percent of 2012 GDP. In a "no policy change" scenario, the congestion cost is estimated to rise to €154 million by 2030, and the overall external cost of transport will rise to €322 by the same year.

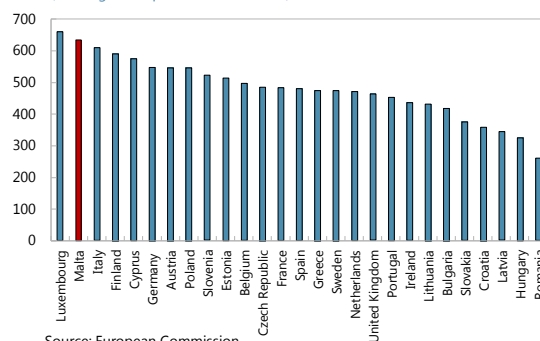
Malta is responding with a comprehensive National Transport Strategy and targeted road improvements. Recognizing the strategic importance of Malta's transport sector for the economy's competitiveness, the authorities launched a long-term, target-bound framework to advance an integrated transport system. The economic goals of the framework focus on reducing congestion, improving efficiency, strengthening connectivity, reducing operational costs, and enhancing ease of access for tourists. The targets linked to these goals pertain to the completion of the Trans European Transport Network (TEN-T) Core and Comprehensive Networks as well as the achievement of bus speed averages during morning peak hours. Moreover, the authorities are planning to substantially upgrade Malta's road network, including the repair, asphaltting, widening, and new construction of roads, as well as building new junctions. The re-surfacing of roads alone comprises an estimated investment of around €700 million. Measures aimed at reducing congestion also include incentives to use common transport, such as limited free bus usage for minors and tax credits for firms providing employee transport.

Malta's energy sector has suffered from fossil fuel dependency and unreliable electricity supply. Malta used to rely heavily on imported fossil fuels, with a share of fossil fuels in energy consumption of 85 percent, and an import dependency on fossil fuels of 98 percent in 2015. The quality of electricity supply is lagging the EU average, on the back of electricity interruptions and voltage fluctuations.

Infrastructure upgrades have made progress in tackling Malta's energy challenges. The authorities have taken steps towards more diversified energy sources. Thanks to a 95-kilometer interconnector cable between Malta and Sicily, operational since 2015, Malta is now connected to the European electricity grid. A new gas-fired power unit and the conversion of an existing plant from heavy fuel to natural gas, supported by an upgraded LNG terminal, contribute to further energy diversification. A gas pipeline to Sicily is in the planning stage. The government is also seeking to enhance Malta's share of renewable energy sources, notably in photovoltaic energy. A recent study of the Central Bank of Malta suggests that the interconnector, coupled with the move towards gas-fired electricity generation and the envisaged decommissioning of the outdated Marsa fuel power station, raise long-term output via a reduction in marginal costs (Rapa, 2017).

Car Ownership, 2015

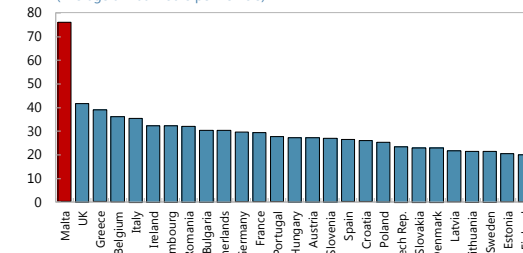
(Passenger cars per 1,000 inhabitants)



Source: European Commission.

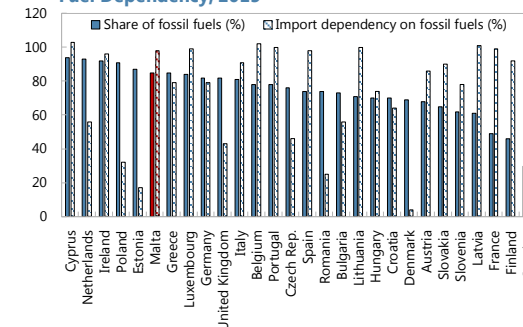
Road Congestion, 2015

(Average annual hours per vehicle)



Note: Malta's geography and urbanization affect cross country comparability.
Source: European Commission.

Fuel Dependency, 2015

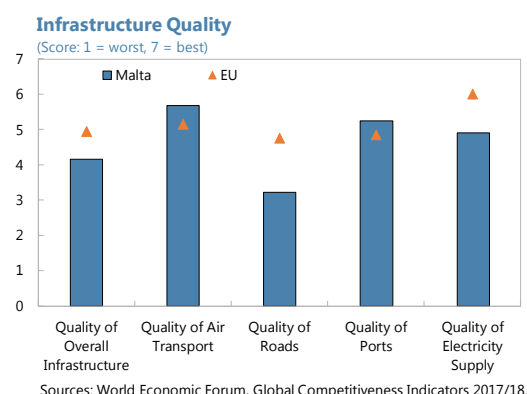


Source: European Commission.

Qualitative measures

9. Survey-based indicators add the quality dimension. While valuation-based or physical infrastructure measures cannot gauge the condition of existing infrastructure, quality indicators complete the picture based on, admittedly subjective, perception of survey respondents. The World Economic Forum's Global Competitiveness Indicators cover a range of qualitative infrastructure elements for an almost global sample and are an established source of cross-country comparison.

10. Quality perception confirms the overall picture of Malta's infrastructure gaps. Like the physical indicators, the quality indicators point to weaknesses in road infrastructure and in electricity supply in Malta compared to the EU average, although the data might not fully capture recent and ongoing investments, including the commencing road overhaul, the construction of a new generating plant and liquefied natural gas (LNG) infrastructure, as well as the interconnector between Malta and Sicily. In contrast, air transport and port quality are perceived as above-standard, fitting into the picture of Malta as a tourism and logistics hub.



C. The Macro Effects of Boosting Public Infrastructure

11. A model-based exercise sheds light on the macro impact of boosting public investment. The EUROMOD version of the IMF's Flexible System of Global Models (FSGM) is calibrated to Malta's macro conditions and used to simulate public investment shocks. FSGM is a semi-structural model combining both micro-founded and reduced-form formulations of various economic sectors (Andrle et al. 2015). Real GDP is determined in the model as the sum of demand components in the short run, and the level of potential output in the long run. Public investment affects aggregate demand directly and cumulates into a public capital stock which represents public infrastructure.³ A permanent increase in the public capital stock results in a permanent increase in economy-wide productivity. The model is described in more detail in Annex I.

12. The Malta-specific model calibration is used to simulate the following assumptions:

- **Temporary public investment shock.** Public investment is assumed to increase by 1 percent of GDP over a period of 7 years, raising the ratio of public investment to GDP from 3 to 4 percent. This scenario corresponds broadly to the authorities' public infrastructure investment plan to overhaul the road network with an amount of €700 million.⁴

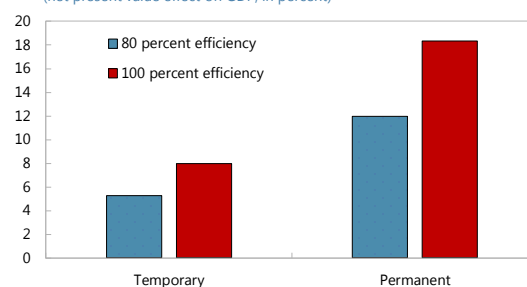
³ The model applies a depreciation rate of 4 percent for public capital. Maintenance costs are not explicitly modeled.

⁴ While the simulation assumes an equal annual distribution of the additional investment amount, the authorities' practical implementation of their road overhaul plan may imply an up-front administrative investment followed by a more gradual build-up of use of funds.

- **Permanent public investment shock.** For comparison of results, the same shock is assumed on a permanent basis, i.e. public investment is raised by 1 percent of GDP indefinitely.
- **Financing.** It is assumed that the investment shock is financed by a budget-neutral reallocation from government transfers to government investment.⁵
- **Efficiency.** In line with staff estimations (see Section D), Malta's public investment efficiency is assumed at 80 percent. Alternatively, public investment efficiency is increased to 100 percent to demonstrate the additional macro benefit of moving to the efficiency frontier.

13. Results point to significant GDP benefits of increased public investment. In line with the model design, short-term GDP effects materialize via the fiscal impulse, while long-term GDP is affected through increased productivity thanks to an expanded public infrastructure stock. Overall, the net present value of additional GDP following the temporary investment shock amounts to 5¼ percent of GDP within 30 years in case of 80 percent efficiency. If full efficiency is assumed, the total GDP effect rises to around 8 percent. In case of a permanent increase of public investment, the net present value of added GDP is estimated at around 12 percent of GDP with 80 percent efficiency, and at around 18¼ percent with full efficiency. More detailed model results are reported in Annex II.

GDP Impact of Public Investment Boost
(net present value effect on GDP, in percent)



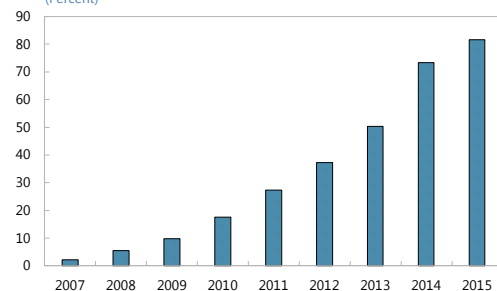
Source: IMF staff.

Note: The temporary shock denotes a public investment increase by 1 percent of GDP over 7 years. It remains at the elevated level in the permanent shock scenario. The NPV is discounted over 30 years at a 3 percent interest rate. Efficiency refers to public investment efficiency.

D. Fiscal Policy Implications

14. The benefit of additional infrastructure needs to be balanced with the fiscal cost. Careful cost-benefit analysis is needed when selecting public investment projects and calibrating costs and financing. To ensure stable public finances over the medium term, increased public investment spending should ideally be budget neutral.⁶ Reallocation of budget resources could be facilitated by the savings generated by Malta's recent comprehensive spending reviews, and potentially further spending reviews in other fields of government. Public investment projects which are co-financed by EU funds could benefit from an increased and more balanced absorption rate. Private-public partnerships could be used wherever appropriate, aided by new financing instruments of the soon-to-be-operational Malta Development Bank, in line with EU regulations and ensuring prudent risk assessment and robust governance structures.

EU Funds Absorption Rates
(Percent)



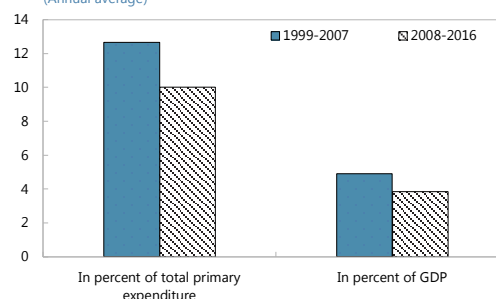
Note: Data cover the 2007-13 programming period and the 2-year payments deadline (until end-2015). Source: European Commission.

⁵ A modeling exercise with assumed external financing, e.g. through additional EU funds, pointed to very similar effects for real GDP.

⁶ To the extent that higher infrastructure investments spur economic growth, corresponding increases in tax revenues will also contribute to financing public investment.

15. Reallocation from current to capital expenditure could free up funds for infrastructure investments. The share of capital expenditure, including capital transfers, fell from an annual average of 12.7 percent of total primary expenditure between 1999 and 2007 to 10 percent in 2008-2016. In percent of GDP, capital expenditure decreased from 4.9 to 3.9 percent over the same periods. Going forward, there might be room to increase the share of capital expenditure without affecting total expenditure.

Capital Expenditure
(Annual average)



Note: Capital expenditure includes GFCF and capital transfers.
Sources: Eurostat; and IMF staff calculations.

16. Raising capital spending should focus on the areas most lagging behind. Disaggregating into economic and functional categories provides a more detailed picture of Malta's public spending. In comparison with EU averages, Malta records relatively high capital spending on environmental, health-related and cultural projects, but capital spending on areas important to infrastructure remain comparatively modest, including general public services, public order, and housing. In economic affairs, Malta's capital spending ranges slightly below the EU average. Overall, infrastructure development in Malta would notably benefit from a rebalancing of public spending from current to capital spending in those areas that support infrastructure and that are currently underrepresented.

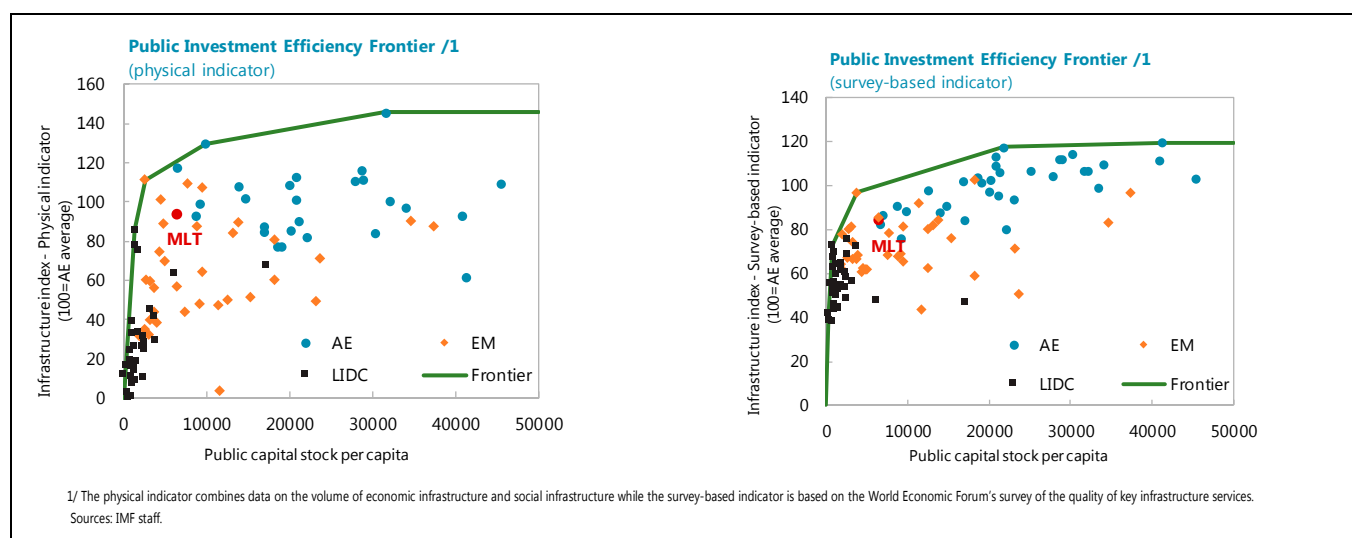
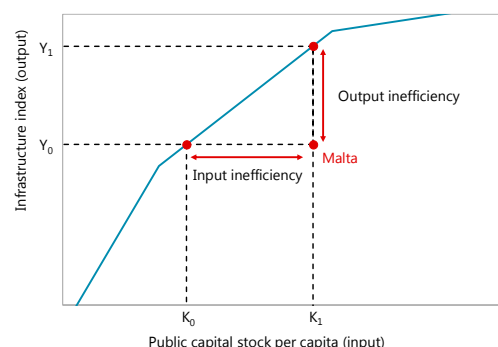
Public Spending in Malta vs. EU, 2015 (Percent of GDP, economic and functional classification)									
	Total expenditure	Current spending	Compensation of employees	Goods and services	Subsidies	Interest payments	Current transfers	Social benefits	Capital spending
Total expenditure	41.2	35.5	12.1	6.5	1.2	2.5	2.2	11.1	5.7
General public services	6.8	6.4	1.4	1.2	0.0	2.5	1.3	0.0	0.4
Defence	0.8	0.5	0.4	0.1	0.0	0.0	0.0	0.0	0.3
Public order and safety	1.2	1.2	1.1	0.1	0.0	0.0	0.0	0.0	0.0
Economic affairs	5.1	3.1	1.1	1.0	1.1	0.0	0.0	0.0	2.0
Environment protection	2.0	0.9	0.2	0.7	0.0	0.0	0.0	0.0	1.1
Housing and community amenities	0.4	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1
Health	5.8	5.2	3.1	1.7	0.0	0.0	0.0	0.3	0.6
Recreation, culture and religion	1.2	0.7	0.3	0.3	0.1	0.0	0.1	0.0	0.5
Education	5.5	4.9	3.3	0.5	0.0	0.0	0.8	0.4	0.6
Social protection	12.4	12.4	1.0	0.8	0.0	0.0	0.0	10.5	0.0

Note: Blue cells indicate expenditure items which are more than 30 percent below the EU average; red cells denote those more than 30 percent above. Capital spending includes gross capital formation and capital transfers. Sources: Eurostat; and IMF staff calculations.

17. Public investment efficiency indicators show the potential for greater investment effects. Recent IMF staff analysis constructs indicators which embody the relationship between the public capital stock and indicators of physical infrastructure as well as infrastructure quality (IMF 2015). The efficiency frontier is determined by those countries with the highest levels of infrastructure coverage and quality (output) for given levels of public capital stock and income per capita (inputs). All other countries are placed below the efficiency frontier.

18. Malta's efficiency gaps amount to around 20 percent. The physical infrastructure indicator gauges public investment efficiency at 76 percent which is broadly average for peer advanced economies (AE). The qualitative, survey-based indicator points to an efficiency score of 84 percent, placing Malta among the lower-ranking advanced economies. Hence, by moving towards the efficiency frontier, Malta could get significantly more physical infrastructure and better infrastructure quality out of its public infrastructure investment.

Public Investment Efficiency Frontier



E. Conclusions

19. Malta's public infrastructure gaps are substantial, notably in roads and energy. Compared to other EU countries, Malta's road network is smaller on a per-capita basis and suffers from poor quality. High car ownership and sky-rocketing congestion rates aggravate the challenges. Energy generation capacity equally lags EU peers, dependency on fuel imports for power generation has been large, and the reliability of electricity supply is seen as weak. This is mirrored in the EU's smallest estimated public capital stock per capita.

20. Model estimations confirm the enormous growth potential of enhanced infrastructure.

Increasing public investment spending by 1 percent of GDP over 7 years raises long-term GDP by around 5¼ percent in net-present-value terms under current public investment efficiency, and to 8 percent when efficiency moves to the frontier. Permanent increases in public investment boost these effects to 12 and 18¼ percent, respectively.

21. The authorities' infrastructure plans go in the right direction and should be implemented in a budget-neutral manner. A far-reaching transport strategy has been launched and road overhauls are underway. Energy infrastructure upgrades are paving the way for more diversification and security of supply. These measures appear appropriate in light of the identified infrastructure gaps. As shown by the

model simulations, a permanent rather than temporary rebalancing from current to capital expenditure would magnify the GDP gains and should hence be considered in earnest. However, to keep public finances on a stable footing, increased infrastructure expenditure needs to be assessed carefully project-by-project, and financed responsibly. Savings from recent and potentially expanded spending reviews and increased use of public-private partnership and EU funds, in line with EU regulations, can contribute to a fiscally sustainable infrastructure push. Finally, public investment efficiency could be increased by carefully reviewing administrative procedures and addressing potential bottlenecks, for instance by removing overlapping responsibilities and moving towards a holistic public investment management approach across government departments.

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Annex I. The EUROMOD Model

EUROMOD is part of the Flexible System of Global Models (FSGM), an annual, multi-region, general equilibrium model of the global economy. A detailed description of FSGM's theoretical structure and its simulation properties are presented in Andrieu and others (2015). Each country/regional block within the model, e.g. EUROMOD for Europe, is structurally identical, but with potentially different key steady-state ratios and behavioral parameters. FSGM is a semi-structural model combining both micro-founded and reduced-form formulations of various economic sectors. Real GDP in the model is determined by the sum of its demand components in the short run, and the level of potential output in the long run.

The Real Side

Aggregate demand follows the standard national expenditure accounts identity, where real GDP is the sum of household consumption, private business investment, government absorption and exports of goods and services, less imports of goods and services. The consumption block is micro-founded and uses the Blanchard-Weil-Yaari overlapping generations (OLG) model of households. Using OLG households that have a finite expected lifetime rather than infinitely-lived households results in important non-Ricardian properties whereby the path for government debt, and thus fiscal policy actions, have significant implications for private consumption dynamics. The model also contains liquidity constrained (LIQ) households that do not have access to financial markets, do not save, and thus consume all their income each period. Adding LIQ households amplifies the non-Ricardian properties of the basic OLG household framework.

In the OLG framework, households treat government bonds as wealth since there is a chance that the associated tax liabilities will fall due beyond their expected lifetimes. The OLG formulation thus results in the endogenous determination of national savings given the level of government debt. Consequently, the world real interest rate is endogenous and adjusts to equilibrate the global supply of and demand for savings. The use of an OLG framework necessitates the tracking of all the stocks and flows associated with wealth, and thus the model has full stock-flow consistency. Private business investment is also micro founded and uses an updated version of the Tobin's Q model, with quadratic real adjustment costs. Investment is negatively correlated with real interest rates. Investment cumulates to the private business capital stock, which is chosen by firms to maximize their profits. The capital-to-GDP ratio is inversely related to the cost of capital, which is a function of depreciation, the real interest rate, the corporate tax rate, and relative prices.

Government absorption consists of spending on consumption and investment goods. Government consumption spending only affects the level of aggregate demand. It is an exogenous choice determined by the fiscal authority. The level of government investment is also chosen exogenously, but in addition to affecting aggregate demand directly it also cumulates into a public capital stock, which can be thought of as public infrastructure (roads, buildings, etc.). A permanent increase in the public capital stock permanently raises the economy-wide level of productivity.

The real competitiveness index (RCI) is the long-run determinant of the level of net exports that adjust to achieve the current account balance required to support the desired net foreign asset position that reflects households' desired wealth holdings. Exports and imports, individually, are modeled using reduced-form equations. Exports increase with foreign activity, and are also an increasing function of the

depreciation in the RCI. Imports increase with domestic activity, and are an increasing function of the appreciation of the real effective exchange rate (REER).

The current account and implied net-foreign-asset positions are directly linked to the saving decision of households. The model can be used to study both creditor and debtor nations as positive or negative net foreign asset positions can be a feature of the well-defined steady-state in the OLG framework.

Aggregate supply is captured by potential output, which is based on Cobb-Douglas production technology with trend total factor productivity, the steady-state labor force, the non-accelerating inflation rate of unemployment (NAIRU), and the actual capital stock. The unemployment rate varies relative to the NAIRU according to an Okun's law relationship with the output gap.

Prices

The core price in all regions is the consumer price index excluding food and energy, CPIX, which is determined by an inflation Phillips curve. CPIX inflation is sticky and reflects the expected paths of import prices and the economic cycle, as captured by the output gap. In addition, although the direct effects of movements in food and energy prices are excluded, there is a possibility that persistent changes in oil prices can leak into core inflation. In addition, there is a Phillips curve for nominal wage growth. Wage inflation exhibits stickiness and allows the real wage to return to its equilibrium only gradually depending on the expected evolution of overall economic activity.

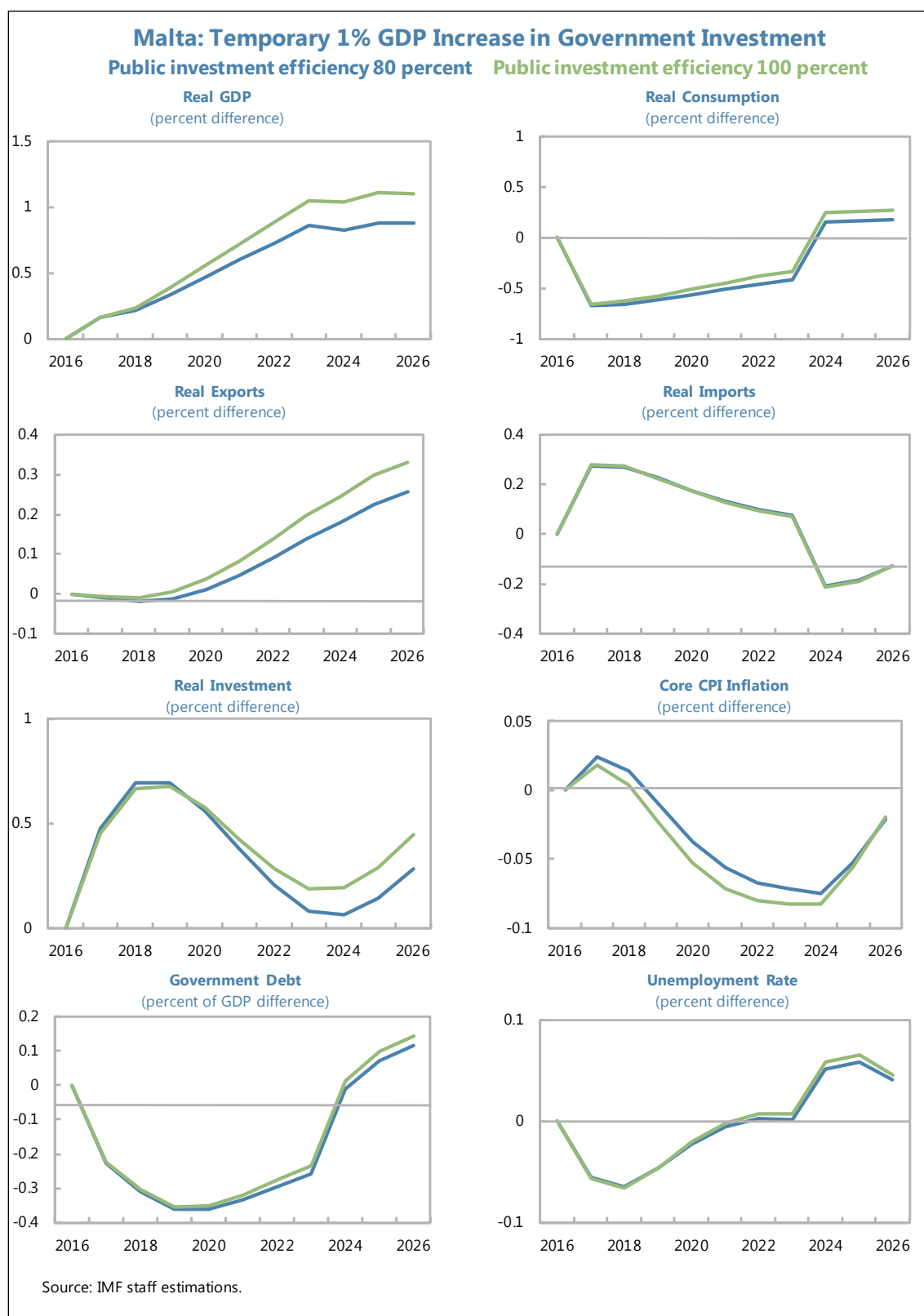
There is also a full set of prices that mimic the structure of demand: consumption; investment; government; exports; and imports. The GDP deflator itself is a weighted average of the consumption, investment, government, export, and import deflators. The model also incorporates three types of commodities – oil, food and metals and their associated prices. This allows for a distinction between core and headline inflation, and provides richer analysis of the macroeconomic differences between commodity-exporting and -importing regions arising from commodity-based terms-of-trade shocks.

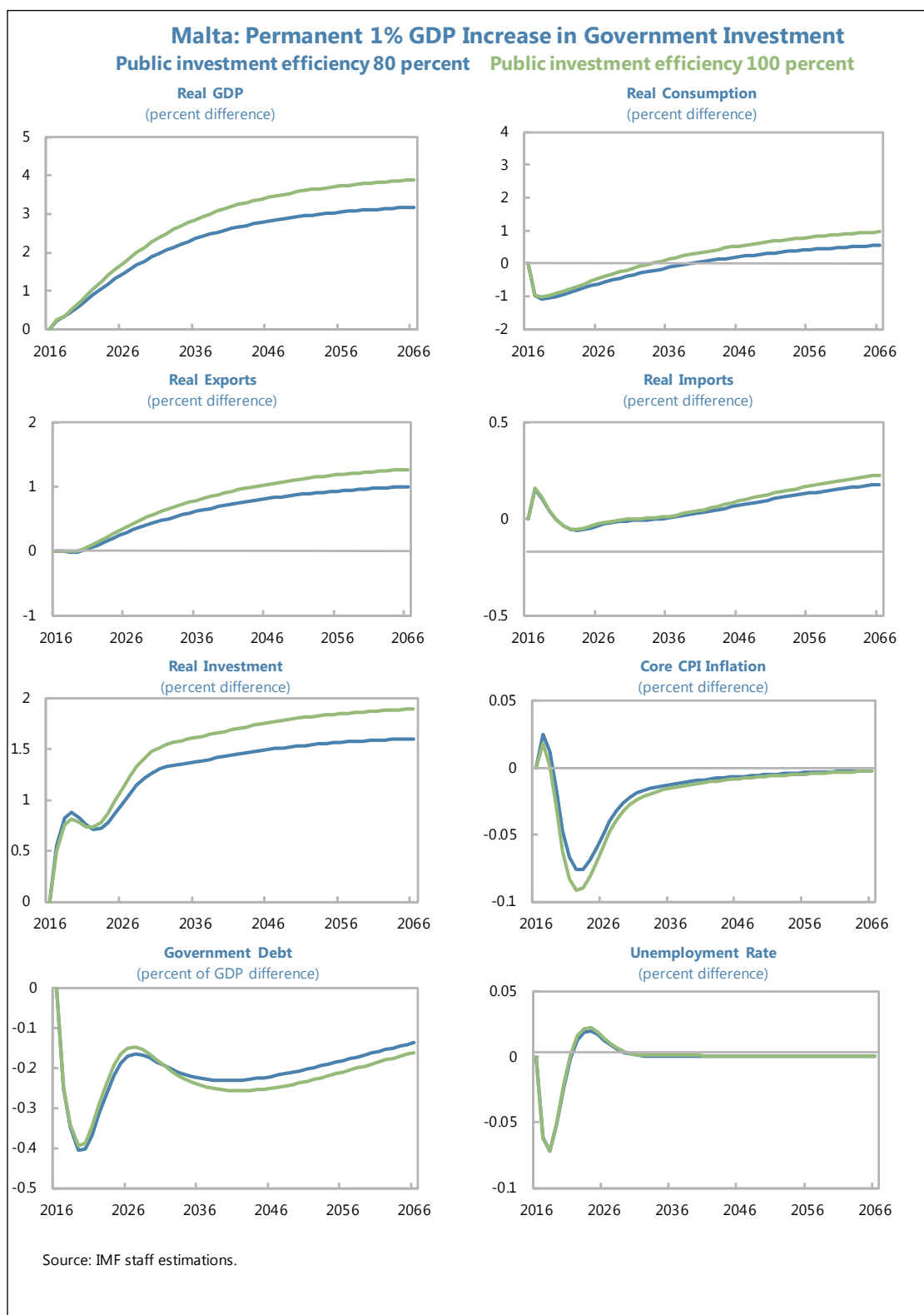
Policy

In the short run, the nominal side of the economy is linked to the real side through monetary policy. The behavior of monetary authorities is represented by an interest rate reaction function. The standard form is an inflation-forecast-based rule operating under a flexible exchange rate. However, the form of the interest rate reaction function is such that there is scope for a fixed exchange rate regime, monetary union, or a managed floating exchange rate regime. Monetary policy can influence activity through both short-term and long-term interest rates. The long-term, 10-year, interest rate is based on the expectations theory of the term structure, plus a term premium. The interest rates on consumption, investment, government debt and net foreign assets are weighted averages of the 1-year and 10-year interest rates, reflecting their differing term structures, and allowing for a meaningful role for the term premium.

The government sector is much broader than government absorption. There is additional spending by the fiscal authority on lumpsum transfers to all households, or targeted exclusively to LIQ households. The fiscal authority chooses a long-run level of debt relative to GDP. To meet its debt target and fulfill spending obligations, the government raises revenue via consumption (VAT), labor, corporate, and lumpsum taxes. In the face of shocks to the economy under the standard fiscal reaction function, all tax rates remain fixed and spending on general lumpsum transfers adjusts to ensure that the public debt-to-GDP ratio is maintained in the medium term. However, the fiscal reaction function can also be specified to use other instruments besides general transfers.

Annex II. Detailed Model Results





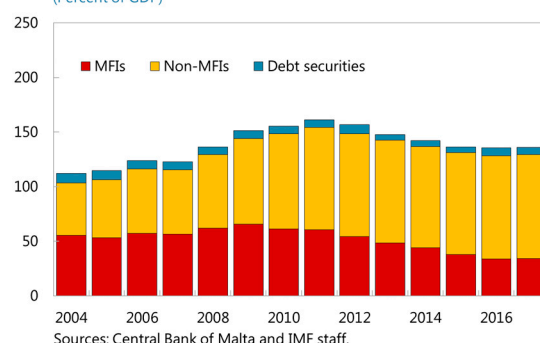
NONBANK SOURCES OF CORPORATE FINANCING IN MALTA¹

Maltese corporates' access to bank lending remains limited, with high costs of borrowing and loans concentrated in the large companies' segment, while the banking system focuses on balance sheet repair from legacy nonperforming loans (NPLs). At the same time, alternative funding channels to bank credit have developed, with intercompany lending taking the most prominent share of financing.² In addition, direct issuance of debt securities and credit from nonbank financial institutions (NBFIs) have been growing rapidly, albeit from a low base.³ This calls for close monitoring and consideration of supervisory and macroprudential measures to this part of the financial sector while its size is still small and vulnerabilities have not materialized.

A. Introduction

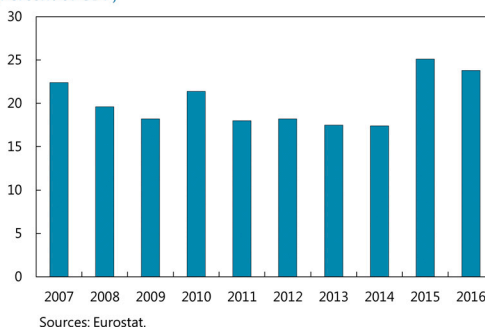
1. Since 2011, traditional bank lending to nonfinancial corporations (NFCs) has been on a declining trend in Malta. Against a background of increasing regulation, increased risk aversion, and an elevated share of legacy corporate NPLs, banks have shifted their lending activity from NFCs to households, particularly mortgages. Loans to NFCs have contracted from approximately 62 percent of GDP (53 percent of total bank loans) in 2009 to 31 percent of GDP (35 percent of total bank loans) in the first half of 2017, owing to both demand and supply side factors (Darmanin, 2017). The largest part of the contraction has been driven by the construction sector, followed by retail and transport. Meanwhile, NFCs' nonbank financing increased significantly from 59 percent of GDP in 2009 to 95 percent of GDP in the first half of 2017, representing mainly an increase in inter-company loans, but also loans from nonbank financial institutions.

Malta: Corporate Sector Financing
(Percent of GDP)



2. At the same time, private investment has increased considerably across sectors in recent years. Despite the decline in bank loans, and pointing to a shift to alternative financing sources, investment in Malta remained strong, with private sector's gross fixed capital formation (GFCF) increasing substantially to around 25 percent of GDP in 2015 and 2016, from 17 percent of GDP in 2014. The largest sectoral contributors to the increases in GFCF have been the energy and aviation sectors.

Malta: Private Sector Investment
(Percent of GDP)



¹ Prepared by Giovanni Ugazio. The author is grateful to participants of a workshop hosted by the Ministry of Finance for their useful comments and suggestions.

² Intercompany lending in this paper is defined as lending between domestic nonfinancial corporations (NFCs), including unrelated NFCs and intra-group lending. The two concepts cannot be disentangled due to data availability.

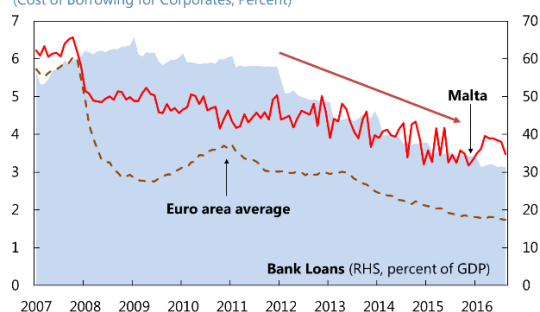
³ In this paper, NBFIs include all financial institutions excluding monetary financial institutions (MFIs).

3. Against this background, this paper examines recent trends for sources of corporate financing other than bank loans in Malta. In particular, the paper discusses (i) the causes for the shift out of bank loans; (ii) the large role played by intercompany loans in corporate funding; (iii) the growing role of market funding through debt securities and of NBFIs corporate loans; and concludes with (iv) policy implications.

B. Disintermediation and Nonbanks: Trends for Corporate Financing in Malta

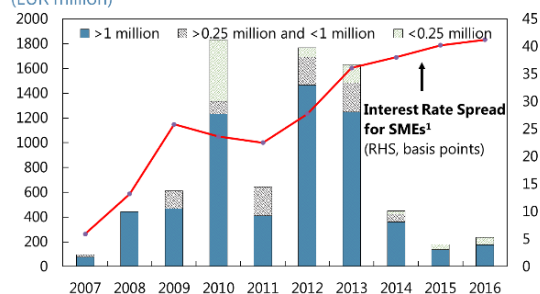
4. The cost of bank borrowing for corporates in Malta is among the highest in the euro area. The average interest rate paid by Maltese companies in the first half of 2017 stood at approximately 200 basis points above the euro area average, with the spread widening in recent years as euro area average rates registered a faster decline than those in Malta. Among euro area peer countries, only Greece and Cyprus have higher average interest rates for corporate loans. The high lending rates reflect several factors, including the limited competition in the NFC lending market,⁴ and an elevated level of legacy impaired loans, which—although declining—continue to weigh heavily on bank balance sheets. Additionally, Maltese corporates remain quite indebted compared with peer countries, reflecting in part many family-owned firms that have low equity. Finally, the shift of corporate activity towards services may also imply less availability of collateral for securing corporate loans and, with a less capital-intensive production, a decreasing financing need.

Malta: Declining Bank Loans and High Interest Rates
(Cost of Borrowing for Corporates, Percent)



Sources: Central Bank of Malta, European Central Bank, and IMF Staff.

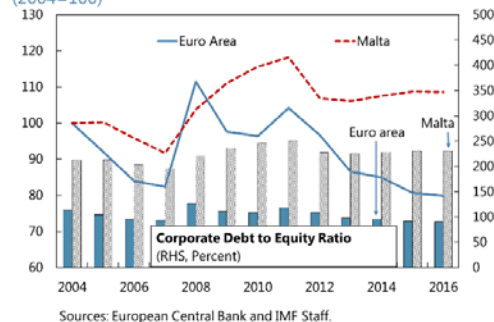
Malta: New Bank Loans to Corporates by Size of Loan
(EUR million)



Sources: European Central Bank and IMF Staff.
1/ Spread calculated as average from December 2007 to date of interest rate charged for loans above 1 EUR million and below EUR 1 million.

5. New business volumes for corporate loans are both declining and concentrated in the large companies' segment. New bank lending to NFCs has declined significantly across all categories of firm size. Nonetheless, the credit supply constraints in Malta affect disproportionately small and medium-sized enterprises (SMEs), with the volume of bank loans extended to SMEs—proxied by the smaller loan sizes—taking a tiny share of new loans. In a further sign of credit rationing for SMEs, the interest rate spread for small loans over larger loans has been increasing significantly.

Malta: Persistently High Debt-to-Equity Ratio
(2004=100)



Sources: European Central Bank and IMF Staff.

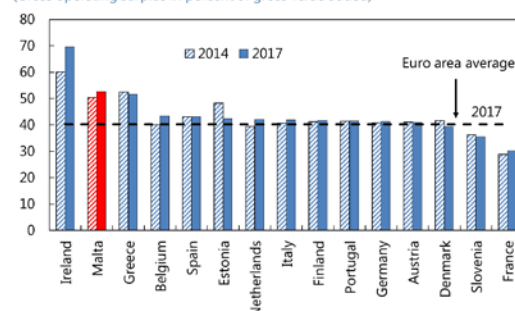
⁴ Two domestic banks provide about 80 percent of the bank loans to the NFC sector.

6. Strong profitability in the past few years may have supported firms' overall financing needs.

The 2016 EU Survey on the Access to Finance of Enterprises (SAFE and Zerafa, 2017) showed that only seven percent of respondents highlighted access to finance as the most important concern. While this share has increased over time, the relatively low percentage may reflect the emergence of alternative financing sources, including the recent increase in firms retained earnings, which is well above levels seen in the euro area. Indeed, about a quarter of Maltese firms surveyed reported that retained earnings has become a significant source of financing for investment and working capital.

Profit Share in Euro Area Countries

(Gross operating surplus in percent of gross value added)

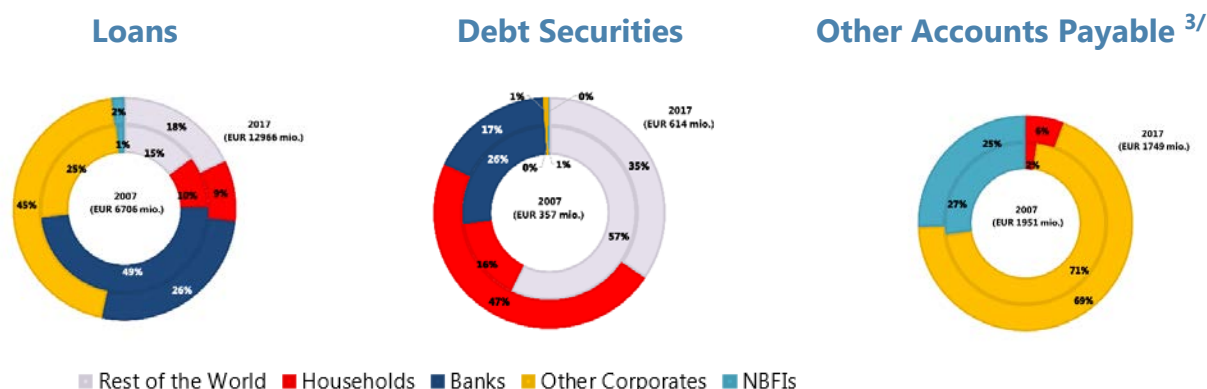


Sources: Central Bank of Malta, Eurostat, and IMF Staff.

7. Maltese corporates changed their financing mix considerably in the past decade.

Corporates have so far succeeded in diversifying their financing out of bank lending by developing a significant domestic intercompany loan market, which has replaced bank lending as the main source of financing. Between 2007 and 2017, loans have remained the primary source of corporate funding amounting to 80 percent of overall non-equity liabilities. However, in the same period, banks' share in overall corporate loans fell from 49 to 25 percent, while intercompany loans increased from 25 to 45 percent. In addition to the increase in intercompany lending between domestic NFCs, external borrowing continues to provide approximately a fifth of loan financing, including direct investment financing from parent corporates. Therefore, while the bulk of intercompany lending is between resident corporates, loan financing includes a significant foreign component in the context of direct investment relationships with a foreign parent corporation. Although still small at two percent of corporate loans, credit from NBFIs—albeit partially reflecting SPE-channeled FDI—is growing fast and the sector is expanding both in terms of size and in terms of variety of operating institutions.

Figure 1. Structure of Corporate Debt^{1/ 2/}



Sources: Central Bank of Malta and IMF Staff.

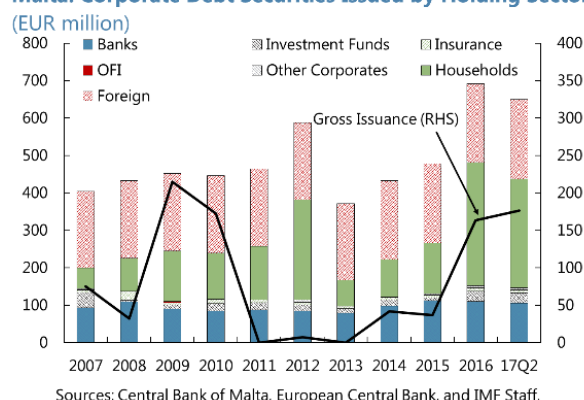
1/ Debt defined as non-equity liabilities

2/ All sectors refer to domestic residents, while rest of the world includes all external financing

3/ Trade Credit accounts for the most of other accounts payable.

8. Debt securities issuance resumed after a few subdued years, and the households' sector purchased most of the debt securities issued by Maltese corporates. Households' financing of corporates increased marginally between 2007 and 2017, but the composition of this financing shifted to include a larger amount of debt securities. In the same period, holdings of corporate debt securities by households increased approximately fourfold. The change is significant, as households' loans to corporates usually represent lending to family-owned enterprises, while the holding of corporate debt securities is a new lending channel for the entire corporate sector. Issues of debt securities are sold by Maltese firms to households through financial brokerages. Although most of these issues are not rated, the current low interest rate environment and the search for yield contributed to an increase in demand for these instruments by savers.

Malta: Corporate Debt Securities Issued by Holding Sector

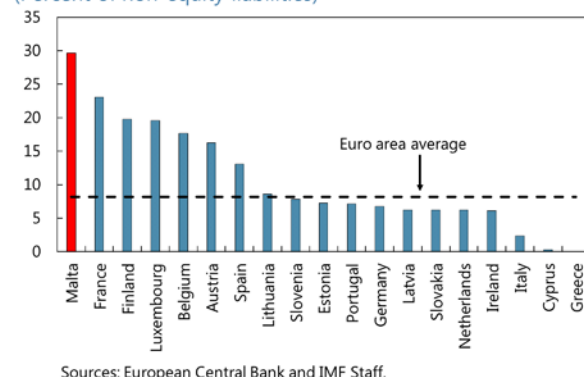


C. Large Intercompany Lending: A Stabilizer for Corporate Funding?

9. Intercompany lending has become the largest source of corporate funding in Malta.

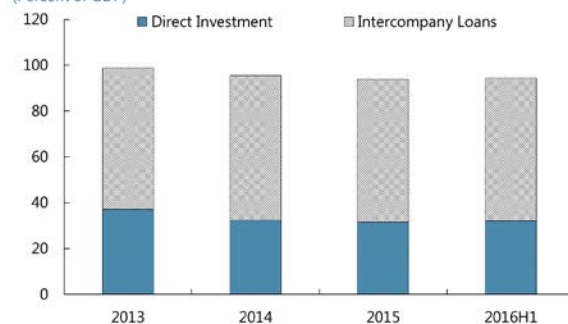
Following the decline in bank credit, intercompany loans between domestic corporates have grown considerably to represent approximately 30 percent of corporate non-equity liabilities in 2017, from 15 percent in 2007. Loans between corporates have provided a stable source of funding mostly for Maltese firms, but their systemic importance raises macrofinancial questions regarding a possible buildup of vulnerabilities within the corporate sector. When compared to peer countries, the share of intercompany loans in Malta is the largest in the euro area.

Malta: Highest Intercompany Loans in the Euro Area
(Percent of non-equity liabilities)



10. Intercompany lending remains subject to a lower macrofinancial scrutiny, despite common characteristics with financial intermediation. Although some of the short-term lending between domestic corporates may help them to manage surplus liquidity, around half of intercompany loans are long-term (above one year of maturity), potentially raising credit risk concerns for lending NFCs. These large illiquid claims within the corporate sector may pose financial stability issues, as a negative shock to profitability in a corporate could spread to its creditors and eventually lead to increasing corporate defaults. Vulnerabilities could possibly spillover to the banking system, if the corporate that provided the loan ultimately financed its activities using bank loans.

Malta: Intercompany Loans and Direct Investment¹
(Percent of GDP)



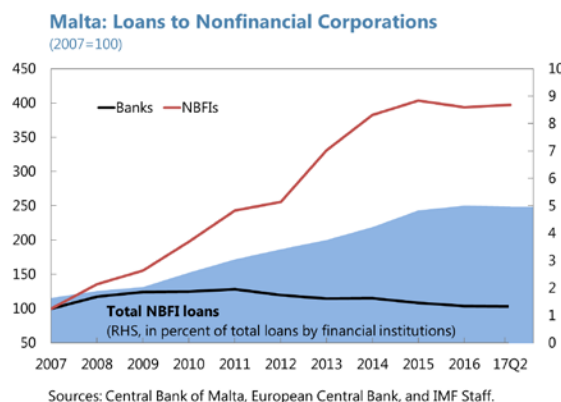
Sources: National Statistics Office, Central Bank of Malta and IMF Staff.
1/ Inward direct investment in nonfinancial sectors.

11. An additional important source of funding is direct investment from foreign corporates. Malta's business-friendly environment continued to attract FDI flows and nonfinancial corporate liabilities to foreign parent corporations stand at approximately 30 percent of GDP. Although this type of funding is generally stable and does not pose financial stability issues in the case of Malta, it may provide a channel for cross border spillovers with possible effects on growth and employment, as well as on fiscal and external positions.

D. Nonbank Financial Institutions Lending: Small but Fast Growing

12. Corporate loans by domestic NBFIs are small, but growing fast. Domestic NBFIs provide credit to corporates mainly in the form of long-term loans and trade credit. Although still relatively small (about 2 percent of GDP in 2017Q2) and possibly reflecting some FDI funding channeled through domestic SPEs, corporate loans issued by NBFIs have quadrupled since 2007 and could emerge as an important funding source for NFCs. On the other hand, domestic institutional investors (insurers and investment funds) do not play a significant role in financing of corporates.

13. NBFI loans are concentrated in the SME segment, but available data do not distinguish the types of institutions involved in lending. Among NBFIs that can lend to the corporate sector, loan funds are a newly established category of NBFI, which invest in loans to unlisted companies and SMEs and are not permitted to lend to financial institutions or individuals. Loan funds are established as "professional investor funds" and their liabilities cannot be sold to retail investors. At present, they do not originate loans but invest in existing loan portfolios and their size is currently small. Factoring companies are NBFIs whose business is to provide credit to corporates by buying invoices and other accounts receivable at a discount. Loans to corporates by other NBFIs, though possible per Maltese financial sector law, is at present not significant.



14. Finally, trade credit also plays a significant role in corporate financing by NBFIs. According to the SAFE 2016 survey, over 80 percent of Maltese firms responded that trade credit is a relevant source of financing. NBFIs hold approximately a quarter of this type of claim on corporates, with some significant amounts representing claims by holding companies on local subsidiaries.

E. Policy Implications

15. Restoring the bank lending channel for corporates. The diversification of funding has supported the operations and investment activity of Maltese corporates in recent years. While overall this is a welcome development, it partly reflects the impairment of bank lending to SMEs. Advancing the resolution of distressed legacy loans would help restore the bank lending channel for corporates and support a better functioning of the monetary policy transmission mechanism. The recently introduced Banking Rule requiring banks to reduce their NPL ratio to below six percent is a welcome step and will help banks to free up resources and reduce the cost of corporate lending. As lengthy insolvency proceedings remain a key impediment for the resolution of distressed loans,

further improvements in the insolvency process in addition to the recent amendments to the Companies Act, remain critical.

16. SME lending by the Malta Development Bank (MDB) should be managed prudently.

The MDB is a public financial institution that was established in May 2017 with the MDB Act, following which the Board of Directors and Supervisory Board were recently appointed. The MDB is expected to commence operations in 2018, and provide SME loans via commercial banks. Although this is expected to improve SMEs access to bank credit, the MDB structure should ensure adequate checks and well-designed origination rules to avoid evergreening or guaranteeing existing bad loans.⁵ This is particularly important in view of the government's already large contingent liabilities.

17. Potential financial stability implications of intercompany lending should be closely monitored. Intercompany lending in Malta has replaced bank lending in becoming the most prominent funding source for corporates. While this development seems to have served well the corporate sector's financing needs and may be evidence of cross-ownership relations between firms in Malta, the unusually large size of lending among domestic corporates may create contagion risk. Moreover, given that a significant amount of these loans is long-term, they provide a stable source of funding for borrowing corporates, but are a riskier asset for creditor corporates, which could be more difficult to liquidate in case of financial stress. In addition, intercompany lending is not subject to diversification principles, with the result that concentrated exposures to specific borrowers or sectors may emerge. Although lending between unrelated entities is in principle subject to licensing by the Malta Financial Services Authority (MFSA), the intercompany lending phenomenon has not been fully assessed by the authorities due to lack of granular data and assumption that most of these loans reflect intra-group activity. Stepping up efforts to better monitor intercompany liabilities would help mitigate financial stability risks.

18. The regulation and macroprudential oversight of NBFIs engaged in lending should be strengthened. Better monitoring NBFI activity would help ensure that credit provision by these institutions does not lead to excessive buildup of corporate leverage or large indirect exposures of banks to corporates, particularly if concentrated in specific sectors. Moreover, disclosure and reporting frameworks for NBFIs must be improved. Although some NBFIs report data to satisfy the requirements of the ECB's statistical regulations and of other EU regulations (e.g. Solvency II for insurance), sectoral balance sheets are not available for all types of NBFIs, making it hard to understand linkages between NBFIs and other sectors in detail. This task is especially important given the increasing, albeit still small, role of "shadow banking" institutions in the provision of credit intermediation. The CBM and the MFSA are currently in the process of pooling resources to improve the statistical and balance sheet coverage of NBFIs.

⁵ The MDB is designed to complement other initiatives to promote SME lending such as the Joint Assistance Initiative for Maltese Enterprises (JAIME).

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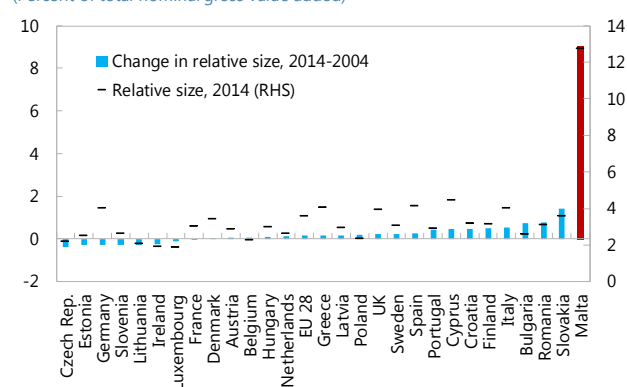
THE GAMING INDUSTRY IN MALTA¹

The gaming industry has become one of the largest and most dynamic sectors in the Maltese economy, with a significant contribution to production, exports, taxes, employment, and productivity. Ongoing regulatory efforts and recent business trends, partly driven by market pressures, should help preserve the comparative advantage gained so far. However, challenges persist, including from a skills gap problem and weak infrastructure.

A. Introduction

1. The gaming industry is a key contributor to Malta's economic growth. Driven by an increasing demand for remote gaming services (e.g., online and mobile casino games, lotteries, and sports betting), the economic significance of the gaming industry has risen in several EU countries (Box 1). But nowhere has this trend been more evident than in Malta, where the share of Arts, Entertainment and Recreation (which includes the gaming industry) in the overall nominal gross value added (GVA) expanded by about 9 percentage points during 2004-14, compared with an EU average of about 0.2 percent. In recent years, the expansion of Malta's gaming industry has been even more prominent as it accounted for more than a quarter of nominal GVA growth during 2012-16.

Arts, Entertainment & Recreation: Change in Relative Size
(Percent of total nominal gross value added)



Source: Eurostat and IMF staff calculations.

2. The success of Malta's gaming industry is explained by several factors. Malta has developed a reputation as a leading licensing jurisdiction for remote gaming benefitting from a first-mover advantage. In 2004, it became the first country in the EU to regulate that industry, attracting investors from several member states, such as Sweden, Austria, and the UK. The Maltese regulatory model is simple and effective, and it has been replicated in other EU countries (European Commission, 2017). Other pull factors include the prevalence of an English-speaking population, the country's business-friendly tax environment and political stability. In addition, the land-based segment of the industry (e.g., casinos) has expanded on the back of domestic income growth and burgeoning tourism.

Gaming Industry in Malta: Selected Indicators

	2014	2015	2016
Gross value added (€m)	795.3	901.4	1010.7
% of total GVA	10.7	11.1	11.6
Number of operating firms	289	276	266
Gaming tax revenue (€m)	52.6	55.2	56.3
% of corporate tax revenue	10.3	9.4	8.7
Exports (€m) 1/	2512.3	2906.3	3181.8
% of total exports	20	22	23

1/ Proxied by exports of the Personal/Cultural/Recreation sector.
Sources: Malta Gaming Authority, Maltese authorities, Haver Analytics, and IMF staff calculations.

¹ Prepared by Jorge Salas. The author is grateful to participants of a workshop hosted by the Ministry of Finance for their useful comments and suggestions.

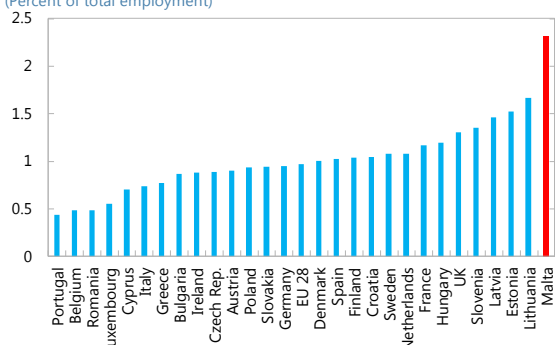
Box 1. Gaming in the EU

The EU gaming market is estimated to grow at 3 percent annually. According to [calculations reported by the European Commission](#), the EU gambling market generated revenues for €85 billion in 2011 and is expanding at an annual rate of around 3 percent. Revenues in the online gaming segment are estimated to have increased from €9 billion in 2011 to €13 billion in 2015, representing around 14 percent of the overall gambling market. The number of online gamblers in the EU is above 7 million.

The contribution of gaming activities to employment and exports is modest for most EU countries. On average, less than 1 percent of total employment in the EU is accounted for by Arts and Recreation activities including gambling and betting. Similarly, for the majority of member states, the share of gaming exports (included in the Personal/Cultural/Recreation sector) in total exports of services is below 1 percent. In contrast, the contribution of gaming to employment and exports observed in Malta is much larger.

Employment in Arts and Gambling Activities, 2014 1/

(Percent of total employment)

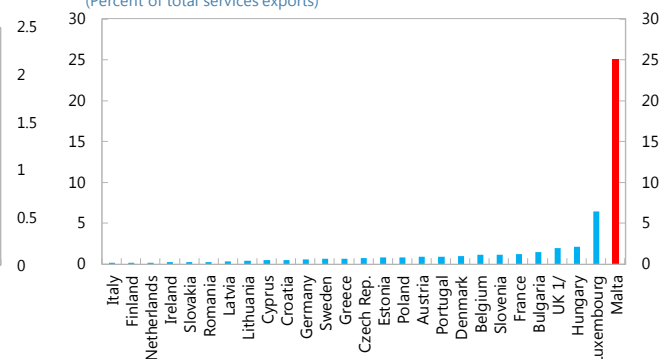


Source: Eurostat and IMF staff calculations.

1/ Data corresponds to employment in R90-92 NACE codes.

Personal/Cultural/Recreation Exports, 2014

(Percent of total services exports)



Source: Eurostat and IMF staff calculations.

1/ 2013 data is used for the UK.

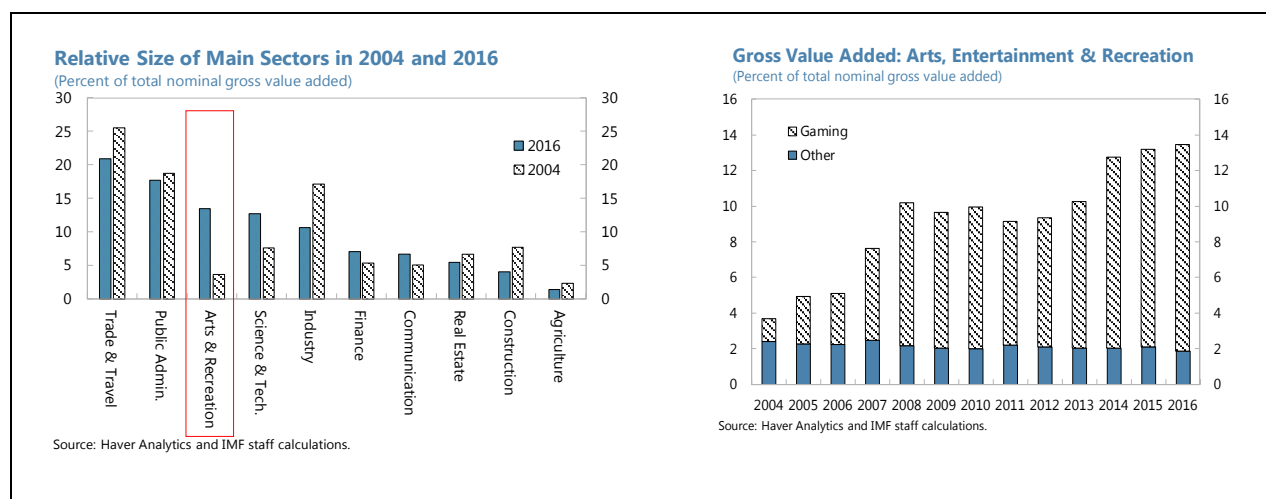
There is no specific EU legislation for online gaming services. While some EU countries have monopolistic regimes run by a public or private operator, an increasing number of members (including Malta) have adopted licensing systems for more than one operator. The existence of diverse licensing regimes in the EU implies that gaming operators targeting customers in different countries need to hold multiple licenses.

A cooperation agreement is in place to tackle challenges of online gaming. A framework for EU [cross-country cooperation](#) was agreed in 2015 to exchange information, best practices, and assist national gaming authorities in their supervisory function. Cooperation focuses on risks including online gambling addiction, financial and identity fraud, and privacy breaches. The arrangement also seeks to ensure well-regulated gaming in Europe, preventing money laundering and match-fixing in sports.

3. This note analyzes the economic significance and challenges for the gaming sector in Malta. First, the relevance of the sector is assessed in terms of its contribution to gross value added, trade, taxes, employment, and labor productivity. Then, the paper describes ongoing amendments to the regulatory framework, such as efforts to tackle financial integrity risks. Finally, prospects for further expansion of the gaming sector are discussed, including challenges from changes to the online gaming regulation in other EU countries, digital skills shortages, and weak infrastructure.

B. Economic Contribution: Production, Trade, and Taxes

4. Gaming has become one of the largest and most resilient industries in Malta. The gaming industry is a major contributor to the Arts, Entertainment and Recreation sector of the national accounts.² The share of this sector in Malta's total nominal gross value added (GVA) increased from 4 percent in 2004 to nearly 14 percent in 2016, becoming the third largest main industry in the economy, behind Trade, Travel, Accommodation and Food, and Public Administration. The average annual growth rate of nominal GVA generated by Arts, Entertainment and Recreation was above 17 percent in the 2012-2016 period, with an estimated deceleration since 2015. The expansion of this sector accounts for the bulk of the economy's structural rebalancing towards services in the last decade. The gaming industry alone (i.e., Gambling and Betting Activities in the NACE classification system) accounted for almost 12 percent of Malta's GVA in 2016.³ Reflecting in part increased merger activity, the number of remote gaming operators somewhat declined in recent years, but it recovered from 266 at end-2016 to 282 in June 2017.



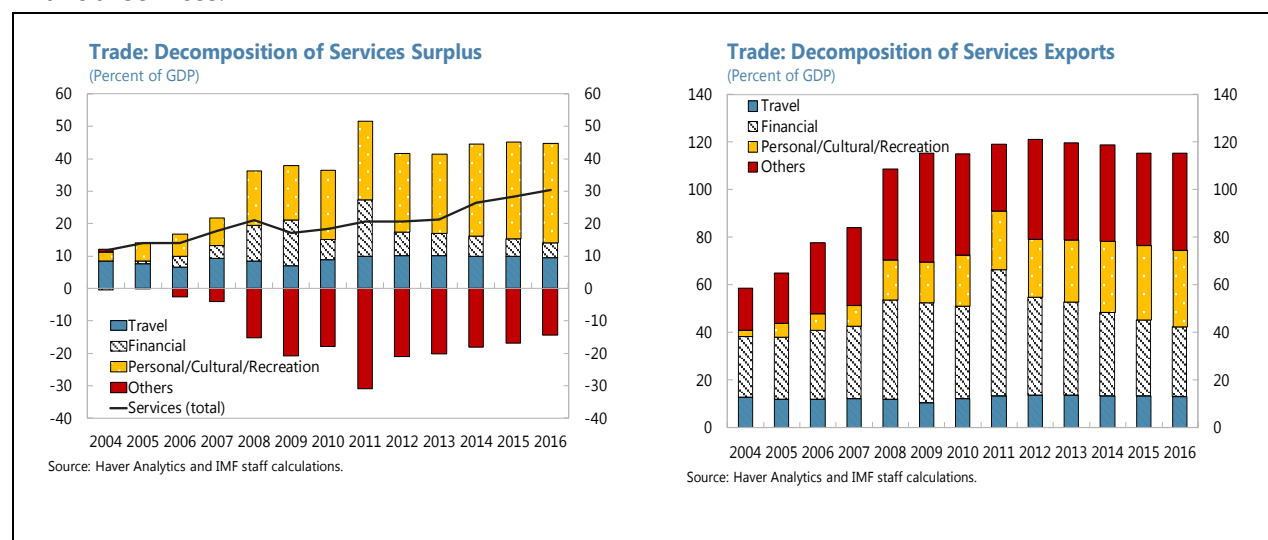
5. The gaming industry has a strong impact on Malta's overall output. A recent study by the Central Bank of Malta (CBM) (2017) estimates sector-specific accounting multipliers based on an input-output framework. In particular, "output accounting multipliers" represent measures of each sector's direct and indirect contribution to the economy's overall output, taking into account the relative amount of final demand driven by each sector. Using symmetric input-output tables for the year 2010, the CBM finds that the sector encompassing the gaming industry ranks second out of 40, contributing to roughly 10 percent of Malta's total output.⁴ This result mainly reflects the gaming industry's sizable final demand, which is dominated by exports. The inter-industry linkages of gaming operators in Malta are mostly limited to some support services, including from consultancy and law firms, data centers, web hosting, hardware and gaming software development, and IT security auditing.

² The definition of this sector corresponds to the R-U codes in the NACE classification system, which also includes Other Service Activities.

³ The remote gaming business generates around 90 percent of the gaming industry's value added, while the rest is accounted for by the land-based segment (Malta Gaming Authority, 2017).

⁴ Cassar (2017) provides additional evidence on the increasing importance of the gaming sector in terms of Malta's GVA, labor income, and employment.

6. The surge in services exports was largely driven by the remote gaming sector. Malta has recently experienced a notable improvement in its current account balance, mainly reflecting the economy's shift to export-oriented services (Grech and Rapa, 2016). The services surplus surged from 12 percent of GDP in 2004 to 30 percent of GDP in 2016. Over the same period, the surplus in the Personal/Cultural/Recreation sector (which includes remote gaming) experienced an even stronger increase from 3 to 31 percent of GDP, largely explained by the rise in its exports as sectoral imports only grew from 0.1 to 1.4 percent of GDP. The destination of more than 80 percent of those exports are other EU member states. The contribution of Personal/Cultural/Recreation to the services surplus has been more substantial than that of other important sectors, such as tourism and financial services.



7. Gaming taxes as a percent of GDP have remained stable in recent years. To attract investors, Malta has set a gaming tax cap of €466,000 per year. Between 2014 and 2016, gaming tax revenues remained unchanged at 0.6 percent of GDP, representing about 9 percent of corporate income tax revenue, whereas their share in total tax revenues marginally decreased from 2.3 to 2.1 percent. In 2016, the industry generated €56.3 million in gaming taxes, a 7 percent increase relative to 2014.

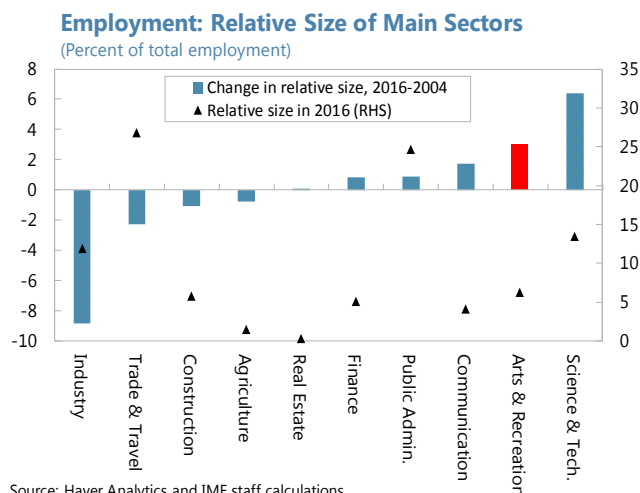
C. Employment and Reliance on Foreign Workers

8. In June 2016, gaming firms and its service providers accounted for 4 percent of Malta's full-time equivalent jobs. A study conducted by the Malta Gaming Authority (2016) estimated overall employment associated with the gaming industry at 8,950 full-time equivalent (FTE) jobs in June 2016, representing around 4.4 percent of the economy total.⁵ Focusing only on gaming firms, the number of FTE jobs was calculated at 6,407 in June 2017, of which roughly 85 percent was accounted for by the remote gaming segment. The expansion of these jobs has been significant, growing at an annual average rate of almost 30 percent in 2015-2016.

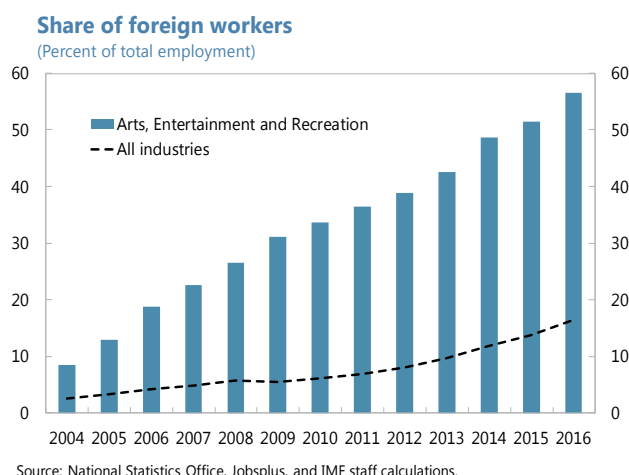
⁵ These calculations include firms offering gaming services from Malta and firms and self-employed persons providing services to gaming firms.

9. Sectoral shifts in employment are partly explained by the gaming industry's growth.

The increase in the relative importance of the services sector has affected the composition of employment in Malta. Per EU employment statistics, Arts, Entertainment and Recreation (including gaming) increased its share in total employment by 3 percentage points between 2004 and 2016, representing now more than a fifth of private sector employment in services excluding Trade and Travel. Only professional services linked to Science and Technology gained a larger share of total employment during that period. At 6.3 percent of total employment in 2016, the relative size of employment in Arts, Recreation and Other Services now exceeds that of Construction and Finance.



10. The remote gaming industry is highly dependent on foreign workers. Survey-based evidence indicates that remote gaming firms have become highly dependent on non-Maltese employees, as they amount to 67 percent of the total (Malta Gaming Authority, 2017). These workers occupy mainly high-skilled and specialized jobs, including 55 percent of technical positions, 61 percent of professional posts, and 70 percent of senior management roles. In the same vein, statistics from Jobsplus (the Public Employment Services) show that the percentage of foreign workers in the Arts, Entertainment and Recreation sector has increased from one-third in 2010 to 57 percent in 2016. The reliance on foreign workforce reflects the digital skills shortage in the country (eSkills Malta Foundation, 2017), driven in part by the requirements of the gaming industry.⁶ To attract international workforce, there is a 15 percent tax cap on the salaries of certain highly-qualified positions occupied by foreign workers in the gaming industry and other activities, as specified in the Malta Highly-Qualified Persons Rules.



11. Wage growth in the gaming sector has been strong. Based on information from the 2017 EU KLEMS database, labor compensation per employee in Arts, Entertainment and Recreation grew by more than 6 percent per year during 2004-2015, on average, compared to nearly 3 percent in the overall economy. Wage pressures in the gaming industry have escalated in recent years, reflecting a high labor turnover—especially among foreign employees—and strong inter-firm competition for workers.

⁶ According to a 2016 study commissioned by the Malta Gaming Authority, the gaming industry accounted for 30 percent of all digital economy jobs in Malta in 2015.

D. Labor Productivity and Structural Change

12. A quantitative framework is used to analyze sectoral drivers of productivity growth.

The decomposition employed by McMillan et al. (2014) allows to assess the contribution of the gaming industry to labor productivity growth in Malta. Economy-wide labor productivity growth can be explained by two components: (i) productivity gains in individual sectors ("within" component), and (ii) labor reallocations across sectors ("structural change"). The quantitative decomposition is given by:

$$\Delta Y_t = \sum_i \theta_{i,t-k} \Delta y_{i,t} + \sum_i y_{i,t} \Delta \theta_{i,t} ,$$

where Y_t and $y_{i,t}$ denote the economy-wide and sectoral labor productivity levels, respectively, $\theta_{i,t}$ is the share of employment in sector i , and the Δ operator refers to the change in productivity or employment shares between $t - k$ and t . The "within" and "structural change" components of labor productivity growth correspond to the first and second terms on the right-hand side, respectively. An important limitation of the analysis below is that sectoral price deflators are not available for Malta, so the decomposition uses data on nominal labor productivity (GVA per worker).

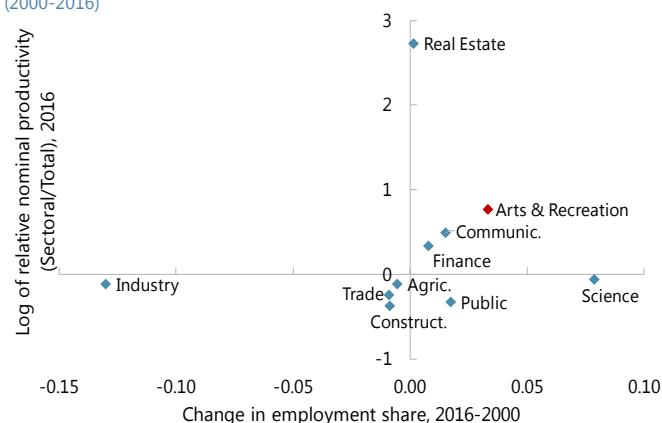
13. Employment gains in gaming were a key determinant of growth-enhancing structural change in Malta. During 2000-2016, nominal labor productivity increased by more than 4 percent per annum, on average.⁷ Roughly a fifth of that growth was accounted for by structural change (0.8 percent) while the remainder was explained by productivity gains within all individual sectors, which were particularly strong in services. The relevance of the gaming industry as a driver of labor productivity growth is underlined by the significant contribution of the Arts, Entertainment and Recreation sector to the structural change component (0.7 percent). In effect, a closer look at the data shows that among the above-average productivity sectors, Arts, Entertainment and Recreation was the most rapidly expanding sector in terms of employment share. More generally, during 2000-2016, labor moved from relatively

Decomposition of productivity growth, 2000-2016 (Average percentage changes, per annum)

Nominal labor productivity growth	Component due to:	
	"Within sectors"	"Structural change"
4.17	3.37	0.80
	<i>of which Arts & Recreation:</i>	
	0.47	0.72

Source: Haver Analytics and IMF staff calculations

Relative Labor Productivity and Change in Employment (2000-2016)



Source: Haver Analytics and IMF staff calculations.

⁷ Real labor productivity grew by slightly above 1 percent, on average, during 2000-2016. The annual growth rates of nominal and real labor productivity were highly correlated over that period (correlation coefficient = 0.9).

unproductive sectors such as Industry (e.g., manufacturing) and Construction to high-productivity service activities including Arts, Entertainment and Recreation, Communication, and Finance. However, some below-average productivity sectors also experienced employment gains during that period (e.g., Public Administration).

E. Regulatory Framework and Risks to Financial Integrity

14. The fast-moving gaming industry requires sustained efforts to ensure that the sector is subject to efficient regulation and effective supervision. To preserve the industry's competitive advantage, ongoing reform aims to eliminate duplication of administrative requirements, simplify the regulatory burden, boost innovation in the business-to-business (B2B) segment, and adopt a risk-based approach to compliance. The new licensing framework seeks to enhance the efficiency of regulatory processes in the sector, while introducing flexibility to deal with technological developments (e.g., role of cryptocurrencies in gaming activities) and meet consumer protection standards. These regulatory measures are being accompanied by stronger emphasis on effective enforcement of compliance.

15. The envisaged regulatory improvements aim also to contain financial integrity risks. The Malta Gaming Authority has stepped up its collaboration with the Financial Intelligence Analysis Unit with respect to Anti-Money Laundering (AML) initiatives (Box 2). Under the current regulation, the only gaming operators that are subject to Anti-Money Laundering and Combating Financing Terrorism (AML/CFT) requirements are casino licensees. Recent legislative and regulatory amendments transposing the EU's Fourth AML Directive (December 2017) bring the remote gaming sector within the AML/CFT framework.

Box 2. Money Laundering Risks in the Gaming Sector

The Malta Gaming Authority has taken steps to tackle money laundering risks in the sector. A [Supranational Risk Assessment Report](#) released by the European Commission in June 2017 highlighted the vulnerability of certain gambling services, such as online gaming, to money laundering risks. Potential risks include operations by gaming companies undertaking or facilitating money laundering, as well as players targeting the industry to launder money. In recent years, the Malta Gaming Authority has suspended or cancelled the licenses of a number of gaming operators investigated by Italian agencies in connection with money laundering. In addition to enhancing its collaboration with the Financial Intelligence Analysis Unit (see below), the Gaming Authority has created an internal AML unit to conduct supervision.

The authorities have strengthened the legal framework to mitigate these risks. The Parliament recently approved amendments to the Prevention of Money Laundering Act and the Prevention of Money Laundering and Funding of Terrorism Regulations. These reforms allowed to complete the transposition of the Fourth AML Directive into Maltese law.

AML/CFT regulation and supervision will follow a risk-based approach. Supervision will be carried out jointly by the Gaming Authority and the Financial Intelligence Analysis Unit. The authorities are elaborating a risk profile of all the gaming operators, which will be updated regularly. This profiling exercise will guide the risk-based supervision model on AML/CFT issues for the gaming sector. The Financial Intelligence Analysis Unit will be responsible for evaluating the outcome of the supervisory reviews and recommending enforcement actions to the Gaming Authority where appropriate (including administrative penalties and the suspension or withdrawals of licenses).

F. Growth Outlook and Challenges Ahead

16. Prospects for growth are still favorable. The Malta Gaming Authority expects further growth in revenue and employment for remote gaming operators over the next few years. New investments are likely to materialize as many foreign companies in the remote gaming sector remain confident in Malta as a start-up location (Ernst and Young, 2017). Expectations for land-based operators are also positive, but somewhat less upbeat than those for remote gaming. The impact of Brexit is still uncertain, but may present opportunities as operators currently established and licensed in the UK and British territories may relocate to Malta as a gateway to the EU. While Malta is likely to remain competitive, given its regulatory framework, possible international corporate tax reforms may affect the sector unfavorably.

17. Recent business consolidation is likely to continue due to market and regulatory pressures. Partly because of increased merger and acquisition activity, the number of operators in the remote gaming industry has declined in recent years (although a recovery was observed in the first half of 2017). This tendency towards business consolidation reflects growing market competition and cost pressures linked to regulatory factors. In particular, companies are facing higher taxation burden and rising costs of licensing and compliance as an increasing number of EU countries are developing their own licensing regimes for online gaming. Against this background, operators are seeking to increase their customer base in markets outside Europe, and Malta could potentially become a major provider of gaming-related services to foreign companies through the growth of the B2B segment of the industry (Malta Gaming Authority, 2016a).

18. Weak infrastructure and skill gaps pose challenges. Addressing the digital and ICT skills shortage is a priority for sustaining the success of the gaming industry. This requires to further facilitate the attraction of foreign workers, including by mitigating pressures on the property and rental market. To improve the educational and training system, the authorities recently launched the European Gaming Institute of Malta, aiming to increase the supply of domestic workers for the gaming sector. Upgrading infrastructure and expanding the availability of modern office space would reduce growth constraints and enhance business productivity (see Selected Issues Paper I).

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