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**Article**

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RESEARCH

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# A reassessment of external demand's contribution to Malta's economic growth

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## Abstract

The role of external demand in determining economic growth has undoubtedly increased as a result of globalisation. However, the conventional approach used to assess the contribution to growth of exports diminishes the positive influence of higher foreign demand by attributing to it the entire increase in a country's import bill. Given that other components of GDP have significant import contents, this approach typically underestimates considerably the importance of external demand in driving growth. This article applies an alternative approach that uses information from input–output tables to apportion imports across all expenditure components, before assessing their relative contribution to GDP growth. When applied to Malta, one of the fastest-growing EU economies, this approach leads to a significant reassessment of external demand's contribution to economic expansion. This is more in line with other macroeconomic indicators, such as the improvement in the country's current account and exports-to-GDP ratio.

**Keywords:** External trade, Economic growth, Contribution demand categories

**JEL Classification:** O47, F43, E32

## 1 Introduction

Over the last decade, the Maltese economy experienced the second-fastest rate of growth amongst EU countries. This has coincided with the emergence of a number of new export-oriented services sectors, such as online gaming, and a pronounced expansion of existing ones, such as aviation services, which have had a significant impact on the islands' main macroeconomic indicators (Grech et al. 2016). This followed the entry of Malta into the European Union, which meant that services firms locating in the islands could now access the single market. Exports of goods and services, in fact, grew by 67% in real terms over the last decade, such that they stood at 133% of GDP. This is the second highest ratio observed amongst all EU countries.

However, the method typically used to compute contributions to economic growth have been suggesting that the influence of exports has been somewhat muted. For instance, in 2015, despite exports of goods and services rising by nearly half a billion euro—the equivalent of a quarter of all government current expenditure during that year—the contribution of net exports to real economic growth was deemed to be significantly negative (see European Commission 2016 and Central Bank of Malta 2016). This result was driven by the fact that during that year, there was an exceptional rise

in imports of capital goods that more than offset the positive impact of the increase in exports.

In a small open economy with no natural resources, like Malta, which depends on imports for a large part of its needs, the demarcation between what constitutes domestic demand and net exports is difficult to fix. The conventional approach which attributes all imports to exports ignores the fact that a very substantial amount of imports are consumer and capital goods or energy, all of which go towards domestic demand. Taking this into account would yield a truer decomposition of the factors driving growth and possibly provide a better guide to policymakers.

In this light, this article applies a different approach to compute contributions to economic growth, which adjusts Malta's GDP expenditure components for their import intensity. The next section describes this method and compares it with the conventional method. The third part of the article outlines the results for import intensities in Malta, looking at two different sources. This is followed by a discussion of the revised contributions to growth. The article concludes with some policy implications.

## 2 Methods used to compute contributions to economic growth

The standard method used to decompose economic growth breaks down demand in an economy into two main components. Domestic demand is conceived as being the sum of private consumption, government current expenditure and gross capital formation, while external demand is captured by exports of goods and services.

The contribution of each of the two demand components is calculated as the growth in that component in real terms multiplied by the previous year's share of that component out of GDP in nominal terms.<sup>1</sup> However, this excludes the impact of imports, which are a leakage from the circular flow of income, and would result in the sum of the two contributions being higher than GDP growth. Hence, the conventional approach has been to subtract the impact of imports from the contribution of exports.

In mathematical form, the contribution to GDP growth of external demand is determined as:

$$ED = (E/Y)_{t-1} \Delta e_t - (M/Y)_{t-1} \Delta m_t, \quad (1)$$

where ED is the contribution to GDP growth of external demand,  $E$  is nominal exports,  $Y$  is nominal GDP,  $M$  is nominal imports,  $e$  is real exports and  $m$  is real imports.

This approach, while easy to compute from official statistics and widely resorted to in economic literature, has clear limitations. While, in today's world of global value chains, exports tend to require a significant component of imports, it is hard to justify removing from the contribution of exports, imports of consumer and capital goods that instead constitute a noticeable amount of an economy's consumption and investment aggregates. By implicitly assuming that domestic demand has no import content, the standard method overstates the impact of domestic demand on economic output (European

<sup>1</sup> This approach (see Robjohns 2007) is based on the premise of real GDP being compiled using annual chain linking (where the price structures used are those of the previous year, rather than those in a specific base year). There are other more mathematically complex approaches to compute contributions to growth (see Eurostat 1999), but these yield the same results. Lequiller and Blades (2014) gives a detailed explanation of the implications of chain-linking on the computation of contributions to growth.

Central Bank 2005). This is particularly an issue for small open economies, where import contents of consumption and investment tend to be higher than in bigger economies.<sup>2</sup>

To address this issue, an alternative methodology, known as the ‘import-adjusted method’ has been proposed, initially by economists from the Netherlands, a perfect example of a small open economy (see Kranendonk and Verbruggen 2008). In this method, imports are apportioned separately to each expenditure component, such that the contribution to GDP growth of external demand is only dampened by that part of imports that are used for the production of exports. In mathematical form, this can be denoted as:

$$ED = (E/Y)_{t-1} \Delta e_t - (ME/Y)_{t-1} \Delta me_t, \quad (2)$$

where ED is the contribution to GDP growth of external demand,  $E$  is nominal exports,  $Y$  is nominal GDP,  $ME$  is nominal imports used in the production of exports,  $e$  is real exports and  $me$  is real imports used in the production of exports.

Since the seminal work conducted for the economy of the Netherlands, this approach has been applied by some institutions of other small open economies (see Bank Negara Malaysia 2013; Danmarks Nationalbank 2017), but its use has not spread widely. By contrast, import intensities of GDP expenditure items have been increasingly used in studies on the relation between trade flows and macroeconomic dynamics, particularly to explain the collapse in international trade after the great recession (see for instance Bussiere et al. 2013; IRC Trade Task Force 2016; Fabiani et al. 2016; Shik Kang and Liao 2016; Auboin and Borino 2017).

As mentioned previously, possibly the main reason why the import-adjusted method has not been widely adopted in the literature is that the process of apportioning imports is not straightforward. Contributions to growth are a much used indicator in macroeconomic analysis and policymaking, and in many advanced countries, it is only recently that the method to do these computations has had to be changed due to the adoption of chain linking. Incidentally, the Netherlands—the first country to adopt the import-adjusted method—had also been one of the first countries to have introduced chain-linked volume measures in the early 1980s, while most other EU countries only adopted this approach after 2005 (Dippelsman et al. 2016).

The calculation of import intensities of expenditure components is a laborious process. While these involve the manipulation of information from input–output tables, it should be noted that the required intensities do not tend to be included in official input–output publications (see Kranendonk and Verbruggen 2008; Bussiere et al. 2013). Input–output tables ‘describe the sale and purchase relationships between producers and consumers within an economy’ (OECD 2017), showing how different sectors supply each other with goods and services and to which final use (i.e. consumption, investment or export) their output is put to. Apart from the domestic matrices normally used in key sector analysis, input–output tables also include a set of import matrices, which provide sectoral information on the amount of imports that are directly used by each sector as an input for its respective production. Import matrices also provide sectoral information on the amount

<sup>2</sup> For instance, Ministry of Trade and Industry (2009) shows that the import content of gross fixed capital formation in Singapore and Taiwan stood at 56% and 47%, respectively, as against 10% in Japan. Similarly the import content of private consumption stood at 34% and 26% in Singapore and Taiwan, as against just 10% in Japan.

of direct imports that are directly absorbed by the final demand components of output, mainly consumption, investment and exports. However, this information does not take into account the indirect imported inputs required to satisfy the final demand components of output. In other words, they do not adjust for ‘the amount of imports induced by the expenditure on domestically provided goods and services’ such as ‘imports of intermediate inputs from foreign suppliers, as well as imports that are already incorporated in capital and intermediate inputs acquired from domestic suppliers’ (Bussiere et al. 2013).

To extricate precisely these induced imports and attribute them to each expenditure aggregate, one needs to construct a cumulated production structure (CPS) matrix which decomposes each component of final demand into primary inputs such as gross value added, compensation of employees and imports. The method proposed by Klein (1983) does not make direct use of the import matrices. Instead, it uses the matrix of primary inputs (including imports) used in intermediate production,  $P$ , the matrix of primary inputs absorbed in final demand,  $S$ , and the matrix of local production directly absorbed in final demand,  $Q$ , all of which are derived from the domestic set of input–output tables.<sup>3</sup> The elements of the latter two matrices ( $Q$  and  $S$ ) are normalised by the total intermediate consumption for each final demand component. This leads to the amount of local industry supply required to produce each unit of total final demand ( $Q^W$ ) and the amount of direct inputs required to produce one unit of total final demand ( $S^W$ ). One also needs to normalise the matrix of primary inputs used in intermediate production,  $P$ , by total gross output so that one finds the amount of primary inputs needed to produce one unit of gross output in each industry. One then combines this information with that contained in the Leontief inverse matrix  $(I - A^*)^{-1}$  which allows to internalise second-round indirect effects. Mathematically, this can be expressed as follows:

$$\text{CPS} = P^W (I - A^*)^{-1} \cdot Q^W + S^W, \quad (3)$$

where  $P^W$  is the matrix of primary input coefficients (where each entry indicates the amount of each primary input to produce one unit of gross output of each industry),  $I$  is an identity matrix,  $A^*$  is the matrix of intermediary input coefficients (where each entry indicates the amount of intermediary input of an industry needed to produce one unit of gross output of other industries),  $Q^W$  is the matrix of domestically produced final demand and  $S^W$  is the matrix of primary inputs, both weighted by the total intermediate consumption for each final demand component. The coefficients of the resulting CPS matrix indicate ‘how much of each primary input category is needed, both directly and indirectly (through the use of intermediaries), to produce each category of final output’ (Kranendonk and Verbruggen 2008).

Besides the data-intensive process described above, the import-adjusted method also suffers from the fact that input–output tables are not published very regularly. For instance, Eurostat requires EU national statistics institutes to publish these tables at 5-yearly intervals (though taking some assumptions one could derive them from annual

<sup>3</sup> While this method does not make direct use of the import matrices, the information contained within these matrices is still utilised indirectly by the method proposed by Klein. Indeed, the rows in matrices  $P$  and  $S$  consistent with the amount of imports used in intermediate production and that absorbed by final demand components are equivalent to the column sum of the two import matrices.

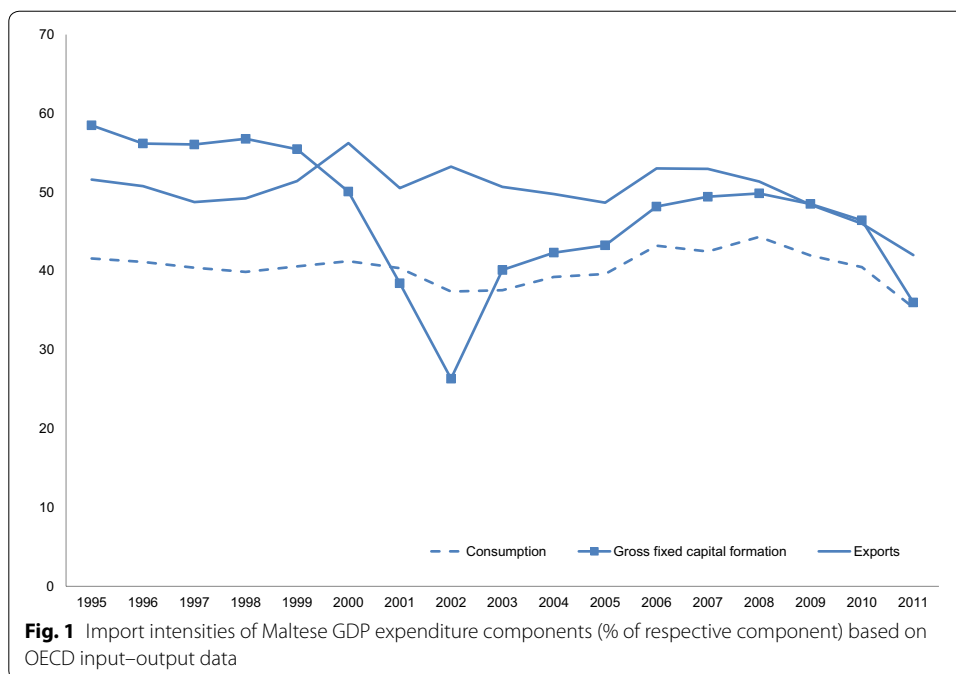
supply and use tables). At the time of writing (i.e. 2018), the OECD's input–output tables were only available up to 2011, while the University of Groningen's world input–output database included information for some EU countries up to 2014. This means that when applying the import-adjusted method, one is typically restricted to using import intensities calculated for one base year. This can be problematic if import intensities are volatile over time, which is quite likely in small open economies particularly in regard to investment.

In the absence of annual estimates for import intensities, the calculation of the import-adjusted contributions to GDP growth requires an additional step to that described in Eq. (2). Since real-life import intensities are bound to change over time, applying the estimated import intensities for a given base year on the values of expenditure components for other years leads to a sum of imports that may differ from total imports. This residual has to be apportioned again across the estimated import content values for the different expenditure aggregates. The presence of large residuals is an indication of significant deviations in import intensities and can be used to qualify the robustness of the calculated import-adjusted contributions to growth.

### **3 Calculating import intensities for Maltese GDP expenditure components**

In 2016, the National Statistics Office (NSO) published the first official input–output tables for the Maltese economy since the adoption of the European System of Accounts (ESA) 1995 and 2010 (National Statistics Office 2016). These give information on the structure of the economy as at 2010. OECD (2017) also provides annual input–output tables for the Maltese economy for the period 1995 to 2011. This section estimates import intensities using the approach described previously on the basis of both sets of tables. Figure 1 shows results for Malta's import intensities for total consumption, gross fixed capital formation and exports estimated using OECD (2017) input–output tables.

As could be expected a priori, OECD input–output tables suggest that the import intensity of Malta's gross fixed capital formation can be relatively volatile. Some of this is due to the small size of the Maltese economy, which means that specific investment projects can impact aggregates very substantially. For instance, the large fall in the early 2000s reflects a statistical quirk, when the national airline sold and leased back its fleet, which resulted in a large drop in investment. Another factor that plays a large role in driving the import intensity of gross fixed capital formation is the composition of investment in a particular year. Since most machinery is imported, one finds unsurprisingly that there is a very strong positive correlation between the estimated import intensity and the relative share of investment in machinery. Thus one finds that import intensity of investment is quite pro-cyclical, as it is driven by the activity of Malta's mainly export-oriented manufacturing sector. This sector's need for restructuring in the years prior to EU accession (Grech et al. 2016) led to a period of weak sectoral growth, in turn explaining the sharp drop in the import intensity of investment in the early 2000s. This was accompanied by some recovery till the great recession impacted significantly demand for Malta's exports of goods. Compared to gross fixed capital formation, the import intensity of consumption and of exports appears to be less volatile. In fact, the coefficient of variation of these two components stands at less than a third of that for the import intensity of investment. Contrary to what one would expect for a small open

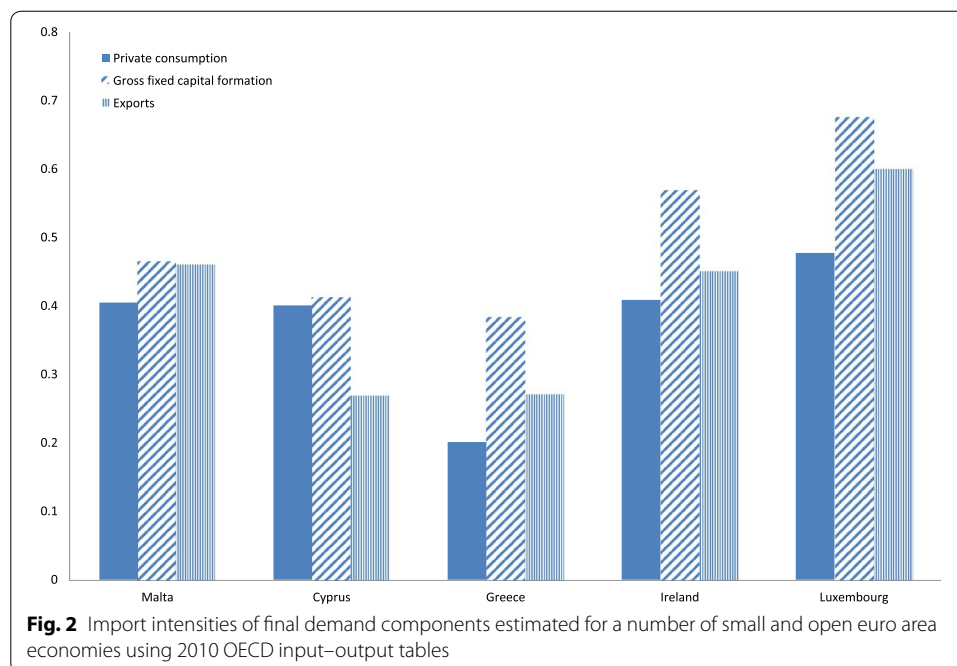


economy that after EU membership saw a large increase in external trade, import intensities for Malta appear to be on the decline. The cause of this paradox is that with access to the single market, there was a considerable structural transformation of the Maltese economy. In light of a trade agreement with the EU, most external trade prior to Malta’s EU membership consisted mainly in goods. Access to the single market led to the relocation to Malta of several export-oriented services firms in sectors such as professional services, i-gaming, information technology, aviation and administrative support. In fact, while in 2003 exports of goods were equivalent to 48% of GDP, while exports of services stood at 60% (mostly tourism), by 2017, exports of goods had fallen to 24% of GDP while exports of services had risen to 109%. Intuitively, one would expect services activity to require relatively less imports than the production of goods, as services activity is more labour-intensive. Moreover, it tends to be less energy-intensive, and since Malta’s energy production is wholly dependent on imports, this structural shift has lowered import demand.

That said compared to advanced economies, the import intensities for Malta’s final demand components are relatively high. Bussiere et al. (2013) reports an average import intensity of 25% for consumption and 28% for exports, though these are driven downwards by the values for the USA. Malta’s import intensities estimated using OECD input–output tables are also relatively high when compared to those of medium-sized open economies within the euro area such as Italy, France and Spain as estimated by Bussiere et al. (2013).

The values for the import content of Maltese final demand components are, however, especially similar to those of other small and open economies in the euro area. Figure 2 shows a comparison of import intensities for three final demand categories estimated for Malta, Luxembourg, Cyprus, Ireland and Greece using 2010 OECD input–output tables.





The import orientation of Malta's final demand components in 2010 is especially similar to that registered in Cyprus and Ireland. This is especially true for the import content of private consumption expenditure which stood at around 40% for these three economies, well above the worldwide average of 25% reported by Bussiere et al. (2013). Maltese import intensities for gross fixed capital formation and exports are slightly higher than those registered for Cyprus and Greece but significantly lower than that registered in Luxembourg. Malta's import intensities for exports are, on the other hand, practically equivalent to those registered in Ireland and significantly lower to Luxembourg, two economies which feature a significant amount of re-exports of goods and services.

Due to their annual availability, OECD input–output tables are very useful in tracking changes in import intensities for Malta, making them especially suited for estimating import-adjusted contributions to growth. However, OECD input–output tables for Malta suffer from a number of issues as they are not as comprehensive in coverage as those prepared by the Maltese statistics office (National Statistics Office 2016). A major issue is that the version currently available does not fully incorporate revisions made in Malta's national accounts as a result of the implementation of ESA 2010. Instead of ESA 2010 used by the NSO tables, the OECD input–output tables used in this study utilise SNA93 conventions. This implies that figures for financial services exports do not include exports done by special purpose entities which typically have very high import content. The industry classification system also differs extensively between the two input–output sources, with OECD tables using the ISIC Rev 3 instead of the NACE Rev 2 classification used by NSO. Cassar (2017) confirms that results derived from ESA 2010 consistent input–output table published in 2016 by NSO differ greatly from the ones that could be derived from previously available supply and use tables which were in line with ESA 95 data. In this light, differences in the national accounting and industry



**Table 1 Comparison of import content estimates for Malta's GDP components in 2010**

	Estimated using NSO (2016) (%)	Estimated using OECD (2017) (%)
Consumption	38	40
Gross fixed capital formation	59	46
Exports of goods and services	74	46

Import intensities for Maltese GDP components using ESA 2010 consistent input–output data published in 2016 by NSO (first column) and import intensities estimated using OECD input–output tables

**Table 2 Comparison of import content estimates for Malta's GDP components**

	Direct imports only (%)	Direct and induced imports (%)
Private consumption	37	44
Government consumption	18	19
Gross fixed capital formation	40	59
Exports of goods	55	67
Exports of services	75	76

Import intensities for Maltese GDP components using ESA 2010 consistent input–output data published in 2016 by NSO. The first column reports direct import content directly used in final demand. The second column includes imports used in the production process of inputs used in the production of final demand

classification standards that exist between NSO and OECD input–output tables could contribute towards differences in the import intensity results derived from the two tables. To this end, Table 1 compares the import content estimates for Malta's GDP components using both data sources.

The more comprehensive input–output table, which is also the official one for the country, yields much higher import contents for both gross fixed capital formation and for exports of goods and services. This is in line with a priori expectations and is mainly driven by exports of financial services, a significant part of which are carried out by special purpose entities that are captured only by ESA 2010 consistent tables. Moreover, the shift to ESA 2010 national accounting standards resulted in significant revisions in investment figures due to changes in definitions and coverage of national accounts, further contributing to the differences between import intensity results derived from the two tables.

Table 2 decomposes the import intensities for each component into direct imports and the sum of direct and induced imports. As expected, the latter exceed the former, though the margin differs across expenditure components. In particular, those parts of aggregate demand which involve lots of linkages with sectors with high import content have much higher total import intensities than items with fewer linkages. Thus, for instance, exports of services (where linkages with other sectors of the Maltese economy tend to be weaker) have relatively lower induced imports than exports of goods, which are characterised by higher multipliers due to stronger inter-industry linkages.<sup>4</sup> Quite interestingly, the import content of exports of services appears to be significantly higher than that for

<sup>4</sup> For detailed industry-specific multipliers for Malta, see Rapa (2017).

**Table 3 Comparison of contributions to GDP growth—standard versus import-adjusted (percentage points of GDP)**

	Domestic demand		External demand	
	Standard	Import-adjusted	Standard	Import-adjusted
2008	4.3	2.3	−0.9	1.1
2009	−1.6	−0.5	−0.8	−1.9
2010	5.0	1.5	−1.5	2.1
2011	−1.4	−0.3	2.7	1.6
2012	0.0	−0.8	2.7	3.4
2013	3.0	3.2	1.6	1.5
2014	3.4	3.3	4.8	4.8
2015	15.8	6.4	−5.9	3.5
2016	0.9	1.9	4.6	3.6
2017	0.6	2.1	6.0	4.5

A comparison between the results of two methods used to calculate contributions to growth in terms of percentage points of GDP growth. The first and third columns show domestic and external contributions to growth estimated using the standard method. The second and fourth columns show domestic and external contributions to growth estimated using the alternative approach put forward in this study

exports of goods. This, to a significant extent, seems to reflect the inclusion of special purpose entities in the financial services sector which has boosted direct imports as a share of total output, while reducing the relative importance of inter-industry linkages, thus reducing induced imports.

#### **4 Comparing the results of the standard and the import-adjusted approaches for Malta**

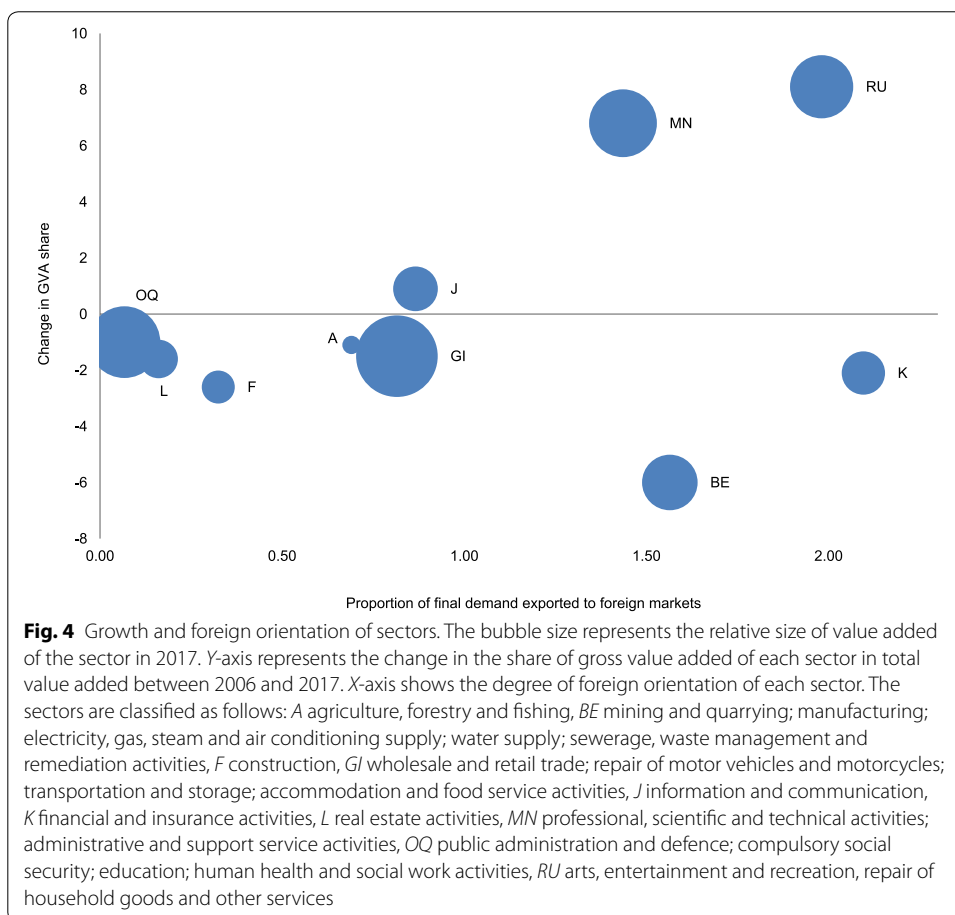
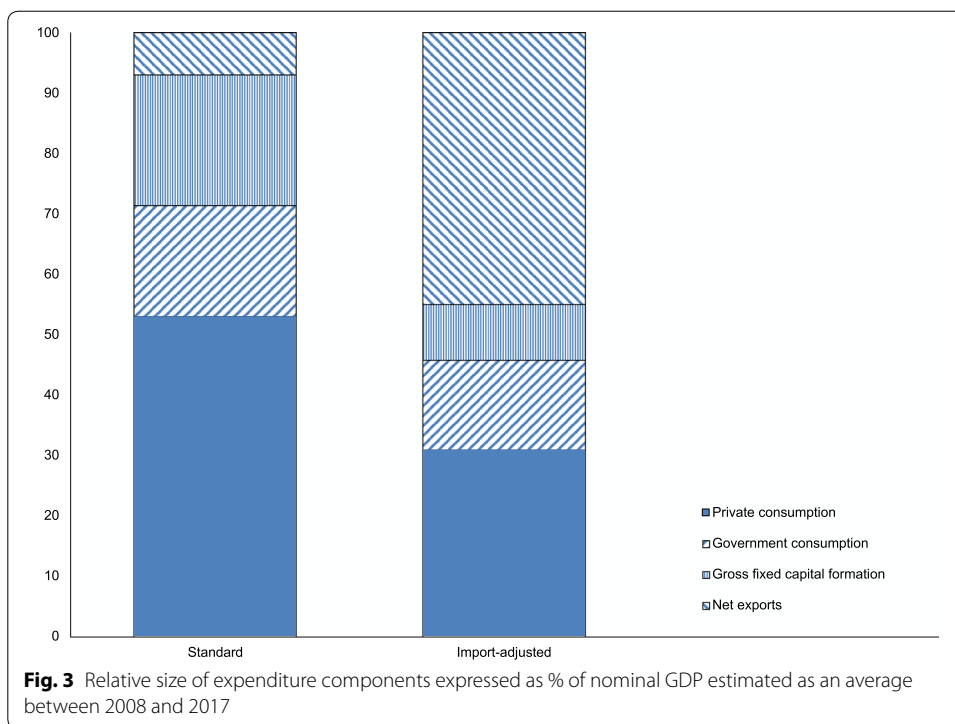
Before discussing the different contributions to growth that arise when applying the standard and the import-adjusted approach to Maltese GDP data, it is appropriate to assess the main shortcoming of the second approach. Given the unavailability of official annual input–output tables, combined with the limited representativeness of the OECD’s annual tables, the best measures of import intensity that can be used to compute import-adjusted contributions are those derived from the National Statistics Office’s input–output table for 2010. To test the reliability of using this one set of import intensities, the amount of total imports in Malta’s national accounts was compared with the sum of the estimated imports derived by multiplying the import intensities with the relevant expenditure component. In the decade between 2008 and 2017, the latter approach yields an estimate of total imports just 5.2% higher than the official import figures. However, the discrepancy for the last 3 years doubled, reflecting the fact that gross fixed capital formation during these years rose substantially due to large projects in the energy sector, which lowered considerably the need to import fuel. To address this, the import share in these years was adjusted in line with improvements in marginal costs of energy production (taken from Ries et al. 2016).

Notwithstanding this caveat, the import-adjusted approach appears to yield more intuitive results than the standard approach. The contributions to growth attributable to domestic and foreign demand according to the two methods are shown in Table 3.<sup>5</sup> These results highlight two important points. First, the import-adjusted approach yields much more stable trends than the standard approach. For example, the latter method shows the contribution of domestic demand to GDP moving from a negative 1.6 percentage points in 2009 to a positive 5.0 percentage points in 2010, a total change of close to seven percentage points in just 2 years. During the same period, the import-adjusted approach shows the contribution of domestic demand to shift from a negative 0.5 percentage points to a positive 1.5 percentage points, that is, less than half the change implied by the conventional approach. In fact, the standard deviation of the contribution of domestic demand derived using the import-adjusted approach is less than half that derived using the standard one. This is also the case for the contribution of external demand. For instance, the conventional approach shows a positive contribution from external demand of 4.8 percentage points in 2014, changing to a negative contribution of 5.9 percentage points in the following year. By contrast, the import-adjusted approach shows a very marginal decline in the positive contribution of foreign demand to economic growth between the 2 years. As pointed out earlier, during 2015, Malta's exports grew significantly, by 3.5%, or more than they had grown in 2014. However, due to the fact that during 2015 there was a surge in imports of capital goods, the standard approach shows a large negative contribution of external demand, which jars significantly with the results of the adjacent years.

The second important result that emerges when comparing the two sets of estimates in Table 3 is that whereas the standard approach implies that, on average, domestic demand was the key source of growth, the import-adjusted method indicates that external demand was the largest contributor. The standard approach suggests that, on average, domestic demand accounted for 70% of economic growth during the decade 2008 to 2017, whereas the import-adjusted approach allocates less than 45% of overall growth to purely domestic demand factors. The latter method indicates that foreign demand had a negative impact on Malta's economic growth only in 2009, while the standard approach portrays external demand as reducing GDP in 4 out of 10 years. The latter reading of this decade of Malta's economic history is relatively counterintuitive and misconstrues the very significant contribution to Malta's economy made by its exporting firms, particularly in the services sector, and the very strong increase in the country's current account surplus.

Figure 3 presents this graphically by illustrating the relative share of nominal GDP of private and government consumption, gross fixed capital formation and net exports over the decade to 2017 consistent with the two approaches. While even under the import-adjusted method, domestic demand components retain the largest share at nearly 55% of overall GDP, this is nearly equivalent to the share attributed to the largest component of domestic demand—private consumption—under the conventional method. The relative importance of net exports under the import-adjusted approach is more in line with the share that export-oriented businesses command in terms of employment and

<sup>5</sup> In the standard approach, the negative contribution of imports is attributed solely to external demand, while in the import-adjusted approach, the change in imports is attributed to all expenditure components in line with the import intensities estimated using 2010 input–output tables. Note that the contribution to GDP growth of inventories is included with domestic demand.



value-added, and is similar to the importance that foreign demand exerts on other macroeconomic variables like inflation.

To see this more clearly, Fig. 4 shows plot of the foreign orientation of sectors in the Maltese economy expressed as an index, against the change in each industry's share in overall gross value added between 2006 and 2017. The former is estimated from the 2010 input–output tables and reflects the proportion of output of each sector that is driven either directly or indirectly by foreign demand. Higher values of the foreign orientation index imply that the sector has a higher proportion of its output that is driven either directly or indirectly by foreign demand. The index is normalised around the economy average so that values larger than one imply a higher than average foreign orientation. The sector with the highest foreign demand component is financial and insurance activities where nearly 95% of output is exported, while the sector with the lowest value is, of course, real estate (as its output cannot by definition be exported). The data show that there is a positive correlation between the degree of foreign orientation and the relative performance of each sector. Indeed, sectors which are more export-oriented have performed relatively better than those that are more domestic-oriented, in line with the results of the contributions to growth pertaining to the import-adjusted method. This trend is very obvious in the professional and support sector and in the arts entertainment and recreation industries (which includes betting and gaming activities). The only two exceptions in this regard are the industrial sector (which has experienced a fall in relative GVA due to the restructuring process of the mid-2000s) and the financial sector.

Finally, even though the traditional and import-adjusted approaches differ significantly in terms of the absolute level of importance given to net exports, it is quite interesting to note that both methods show an increasing role for foreign trade. In fact, the relative share of net exports in the standard approach has increased by ten percentage points of nominal GDP between 2008–2012 and 2013–2017, whereas the import-adjusted approach implies a four percentage point rise. This suggests that no matter what statistical approach one adopts, it is clear that the Maltese economy is becoming ever more export-oriented, making the retention and improvement in external competitiveness ever more important as a policy aim.

## 5 Conclusions

The aim of this article was to reassess the role of external demand in explaining the very rapid growth of the Maltese economy in recent years. The standard approach used to compute contributions to growth, by offsetting all import growth against exports, leads one to believe that Malta's strong economic performance was inward-driven, fuelled by private consumption. Using information from input–output tables to compute the import intensities of the various GDP expenditure components conversely indicates that the acceleration in economic activity was driven mostly by the success of export-oriented sectors. This is much more in line with other macroeconomic indicators, such as the turnaround in Malta's balance of payments from a large current account deficit to one of the European Union's largest current account surpluses.

The fact that Malta's growth was externally driven, rather than internally driven, has important policy implications. For instance, it suggests that the islands' future growth prospects are very dependent on the continued success of the high value added services sectors that have been attracted to it in recent years. Thus external competitiveness is a key issue

for the Maltese economy. In the context that fast economic growth has led to an accentuation of skills shortages and considerable pressure on infrastructure and the housing stock, ensuring the sustainability of recent performance will require considerable investment.

#### Authors' contributions

NR estimated import intensities (direct and indirect) from NSO Input Output and OECD Input Output databases. NR analysed and interpreted results. AG used import intensities to estimate the import intensity adjusted contributions to growth. AG analysed and interpreted results. Both authors read and approved the final manuscript.

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Not applicable.

#### Competing interests

The authors declare that they have no competing interests.

#### Data availability

The datasets used and generated during the current study is a combination of data provided by the National Statistics Office (NSO) of Malta and the OECD. With regard to the latter, the data can be found in: <https://stats.oecd.org/Index.aspx?DataSetCode=IOTS>. All data generated and used in this study are available from the authors upon request.

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