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Understanding the Economic Contribution of Tourism in Malta: A Literature Review*

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Abstract

The paper presents a critical assessment of the key studies which present empirical estimates for the contribution of the tourism sector to the Maltese economy. The observed discrepancies in the estimates derived from these studies has in part led to a situation in which there is a widespread divergence relating to the specific economic contribution of tourism in Malta. The paper evaluates the estimates derived by these key studies in the context of both the strengths and weaknesses of their respective modelling frameworks, which range from the construction of tourism satellite accounts, to input-output models and computable general equilibrium modelling, as well as an evaluation of the overall quality of the data utilized. The paper therefore, attempts to identify and clarify the main causes behind the observed variations in the resulting estimates and through a systematic comparative assessment also aid in the providing a further understanding of the potential economic contribution of tourism to the Maltese economy. On the basis of this assessment it is suggested that the contribution of tourism to the Maltese economy should account for approximately 5.7 per cent of total Gross Value Added when taking account solely direct effects, 12 per cent once indirect effects are included and roughly 17 per cent accounting also for the induced effects. Furthermore, on the basis of this assessment, the paper highlights the need for further research in this area given the significance of the tourism sector to the small island economy of Malta.

Keywords: tourism contribution, Malta, input-output analysis, multiplier

Classification: C67, D57, L83

1. Introduction

In 2015, tourists visiting the Maltese Islands amounted to a record 1.79 million, staying an average close to eight nights and spending a total of approximately €1.64 billion, or approximately 18.7 per cent of Gross Domestic Product (GDP). In addition, around half a million tourists visited Malta via luxurious cruise liners which berth in the majestic Grand Harbour. Whilst the typical tourist is British, Malta has become a popular destination with Italian, German, French and Spanish tourists which together with the British accounted for 63.2 per cent of all tourist visitors to Malta in 2015. The industry directly generates around 10,000 full-time jobs in accommodation and food services alone. [1]

Whilst tourism has long been regarded as one of the key pillars of the Maltese economy, there is widespread disagreement about the exact economic contribution of tourism. Some estimate its contribution at almost 30 per cent of the economy (Blake et al., 2003; WTTC [2], 2015). Recent reports, namely the European Commission's 'Country Report March 2014' and the OECD 'Tourism Trends and Policies Malta 2014' also refer to a contribution of tourism in Malta of approximately 30 per cent of GDP. However, the results from a number of empirical studies, which will be discussed in the paper, indicate that this estimate may, to a large extent, be overstated.

In an attempt to construct the first Tourism Satellite Account (TSA) for the Maltese economy, Sacco (2016) estimates a more conservative contribution of Malta's tourism industry at 5.7 per cent of the total Gross Value Added (GVA) (or 6.1 per cent of GDP) corroborating the results obtained from studies which apply input-output modelling techniques. [3]

2. Scope and Methodology

The underlying aim of this paper is to identify and clarify the main causes behind the observed variation of the contribution (or impact) of the tourism sector to the Maltese economy which may be observed amongst the various studies. The methodology employed is primarily a literature review of all studies on the impact of tourism in Malta. The paper will identify estimates of the tourism contribution from various sources and compare and contrast the different methodologies employed thus providing a critique of the analysis and a comparison of results.

[1] For the latest main tourism indicators refer to Appendix Table 1.

[2] WTTC is a forum for travel and tourism industry made up from the global business community and works with governments to raise awareness about the importance of tourism.

[3] The Tourism Satellite Account for the Maltese economy was constructed by Sacco (2016) for the reference year of 2010.

When evaluating such estimates, it is important to acknowledge that the methodologies[4] upon which they are derived may vary extensively in terms of both modelling complexity and the overall quality of data utilized for the study itself. The comparative assessment provided in this paper, also aims to provide a deeper understanding of how this contribution may have evolved over time as the tourism industry faced various challenges and exploited various opportunities to maintain its key role as a key driver of growth.

3. Contribution of the tourism sector based on Tourism Satellite Accounts

Within the context of national accounting, an industry is typically measured from the output side by calculating the value added (namely total turnover less intermediate cost) of each producer within that given industry. However, unlike traditional sectors such as agriculture and transport, there is no industry classification under the European Statistical Classification of Economic Activities (NACE) Rev.2. that is specific to the tourism industry (or sector). This issue stems predominately from the underlying nature of tourism activities, in that the sector's supply and demand engages a wide range of activities to and from multiple sectors (Hara, 2008). It should be noted, that it is nonetheless possible to assess those industries which are mostly associated with tourism activities which do have a NACE classification, such as the "accommodation" industry and the "food service" industry. Together, these two industries amounted to 5.2 per cent of GVA in 2015. But not all the value added generated by these industries is attributable to tourist demand. Likewise, the value added generated by museums and heritage sites is classified under the recreation and culture. But most of the visitors are tourists and thus can be classified under the tourism industry.

In order to appropriately measure the full extent of tourism activities from both the demand and the supply side, national statistics offices generally compile what are known as Tourism Satellite accounts (TSAs). TSAs analyse in detail all aspects of the demand for goods and services associated with the activity of visitors; to observe the operational interface with the supply of such goods and services within the economy; and describe how this supply interacts with other economic activities (TSA: RMF 2008). TSAs are not a modelling but an accounting tool that records annual activities of tourism as an industry (Hara, 2012). The TSA is an extension to the system of national accounts which enables an understanding of the size and role of economic activity related to tourism which may not be clearly captured by national accounts.

The TSA is made up of a unique set of inter-related tables that show the size and the distribution of the different forms of tourism consumption in a country and contributions

[4]For an extensive overview on the various methodologies that can be applied to assess the impact of the tourism sector on an economy refer to Hara (2008) and Dwyer et. Al (2012).

to GDP, national income, employment, and other macroeconomic measures of a national economy. Outputs derived from the TSA can be directly compared to main macroeconomic aggregates produced by the system of national accounting for other industries within the economy (Hara, 2008).

A study by Sacco (2016) presents the first attempt to construct a set of TSA tables for the Maltese economy in which estimates for the direct contribution of the tourism sector to the total GVA generated in the Maltese economy are presented based on two methodologies. Sacco (2016) estimates that Malta's tourism industry directly generated an amount of GVA equal to €330.4 million during 2010, which equates to approximately 5.7 per cent of total GVA. This estimate is generated by subtracting the proportional value of intermediate consumption from the tourism share of output for each tourism related sector. Given that this method is however subject to criticism (OECD, 2000), the net ratio approach, which is an OECD recommended methodology (OECD, 2000), is also applied in order to calculate total direct gross value added (TDGVA). One of the key characteristics of this approach is the application of specific intermediate consumption to output ratios, relating to the main characteristic industry of each product, in such a manner that each product is now allocated a quantity of intermediate inputs which are characteristic to that of the associated industry, rather than the specific product type. The TDGVA derived by Sacco (2016), based on the net ratio approach, estimates that Malta's tourism industry directly generated an amount of GVA equal to €330.1 million during 2010. This implies that both methods estimate an approximately consistent level of direct contribution to total GVA generated by the tourism sector, which in 2010 amounted to 5.7 per cent. It is important to note, that tourism satellite accounts assess the direct contribution of the tourism sector but do not include the indirect effects on other industries and induced effects from consumption generated through the generation of salaries and wages.

4. The Input-Output modelling approach to measuring tourism's contribution

To capture indirect and induced effects, an input-output framework is required. An input-output model is a quantitative economic technique that represents the interdependencies between different sectors of an economy. Input-output tables track the output generated by an industry as the intermediate input in the production process of another industry or the final purchase by the various consumers (Miller and Blair, 2009). Nevertheless, it is important to note that the input-output framework assumes fixed prices and the use of capital and labour in fixed proportions. In reality, an increase in tourist demand may not necessarily increase output of other industries in the presence of supply constraints in those industries which would compel them to raise prices rather than meet the excess demand through higher production. Thus, the assumptions underlying input-output models

may not always hold, therefore leading to possible overestimations of the contribution of a given sector. In addition, the input-output framework assumes that a change to final demand, and thus also tourism expenditure, will not lead to any changes in the technology of production as well as no changes in the proportion of capital and labour used within the production process. Although one acknowledges the empirical usefulness of input-output methodologies, this framework's underlying modelling assumption implies that empirical results need to be evaluated with caution, particularly in the presence of significant changes in the composition of tourism expenditure over time and the possibility of potentially overestimating the indirect contribution of tourism.

Through the input-output methodology it is also possible to capture the fact that to generate its output, the tourism industry employs workers in return for wages and salaries, which income they spend on goods and services. Thus, the initial tourist expenditure also generates these 'induced effects'. In this respect, another limitation is that the standard input-output framework ignores the impact on savings when indeed an increase in tourism related income need not be entirely consumed and could even be associated with an increase in the marginal savings rate and hence a lower induced effect than the one portrayed by the input-output framework. It should be noted that although three studies which are to be discussed in the subsequent sections compute various types of multipliers, such as the output multipliers[5] and employment multipliers[6], it was decided that emphasis should be placed primarily on value added multipliers. These are the multipliers which adhere closest to the statistical concept of GDP and thus lead to a better understanding of the contribution of tourism to the Maltese economy.

4.1 Industry Linkages and Multipliers in Tourism derived from a IOT for 2001

Despite the limitations highlighted above, the use of input-output models remains important in understanding the linkages between tourism and the rest of the economy and in comparing the multipliers of the different industries with those of tourism. As a predominantly service-based industry, it is often presumed that tourism generates large multipliers compared to, say, manufacturing which necessitates the importation of raw materials and energy products which in turn tends to diminish multipliers.

[5] A type I output multiplier for a given sector j may be defined as the total value of production in all sectors of the economy that is necessary in order to satisfy a €1 worth of final demand for sector j's output (Miller and Blair, 2009). This multiplier is primarily an indicator of the degree of structural independence between the industries in the economy.

[6] The employment-output multipliers derived in Cassar (2015) and Blake et. al. (2003) are also referred to as physical employment-output multipliers (Miller and Blair, 2009). They assess the effects, in terms of monetary income, that changes in the final demand for a sector have terms of the physical amount of jobs created.

Table 1: Stage 2 Report (2003) - Input-Output Model

Malta (2001)	Direct	Direct + Indirect	Direct + Indirect + Induced	Direct + Indirect + Induced + Government Interacting
The Economic Impact of Tourism				
GNP (million LM)[1]	155	200	279	480
GNP (% share)	9.5	12.3	17.1	29.5
Multiplier				
GNP (million LM)	0.49	0.63	0.87	1.50

[1] *The Euro replaced the Maltese lira (MTL) as the official currency of Malta on 1st January 2008 at the irrevocable fixed exchange rate of 0.429300 MTL per 1 Euro.*

Source: Blake et al. (2003)

Blake et al. (2003) in their Stage 2 Report calibrated a 10 industry Input-Output table for Malta using data for 2001. The main tourism sectors examined in the model were accommodation, restaurants, car hire and the national airline. A total spending of €750 million (Lm322 million or 19 per cent of 2001 GNP) left less than half of it (i.e. 9 per cent of GNP) in the economy when leakages such as imports are excluded, representing the direct contribution. Nevertheless, this expenditure generated further 'indirect' expenditure in other industries. If one includes these indirect effects, the tourism industry may be said to have contributed to €465 million (or 12 per cent of GNP) in the Maltese economy in direct and indirect effects. Blake et al. (2003) estimate the induced effects at €184 million or 4.8 per cent of GNP. Should these be added, in total, it would bring the total contribution of tourism to almost 17 per cent of GNP. The main multiplier results obtained from the study by Blake et al. (2003) are illustrated in Table 1.

Multipliers measure the impact on the total economy as a result of an initial increase in the final demand of a specific industry. The value added multiplier measures the value added generated for every Euro spent by tourists in the economy. Value added Type I multipliers are often less than unity as value added excludes the intermediate costs involved in the output generated to meet the tourist demand. Multipliers to a high degree depend on the inter-industry linkages. The more an industry is integrated with the other domestic industries, the higher the multiplier. It is important to note, that the higher the level of leakages in the economy, such as imports, taxes and savings, generally, the lower the overall sectoral multipliers will be (Miller and Blair, 2009).

The tourism value added multiplier derived in Blake (2003) is less than unity (0.63)

when taking accounting of both the direct and indirect effects. Direct impacts reflect the value added generated domestically by the tourism sector. Indirect impacts represent the value added remaining after several rounds of spending by industries linked with tourism. A multiplier which includes both the direct and indirect effects is referred to as a Type I multiplier. When one includes the change in household consumption generated by changes in the wages and salaries earned as a result of the direct and indirect effects of economic activity taking place in the tourism sectors (i.e. the induced effects), the gross value added multiplier for tourism is still below unity. This is called the Type II value added multiplier and in the case of tourism is estimated at 0.87 (Blake et al., 2003). Blake et al. (2003) also chose to include a government interacting effect which raises the tourism contribution to almost 30 per cent, however, it should be noted that underpinning the government interacting multipliers are some very rigid assumptions which exclude significant behavioural effects and which most likely result in a substantial overstatement of the true economic contribution of tourism.[7]

4.2 Industry Linkages and Multipliers in Tourism derived from a SIOT for 2008

The study by Cassar (2015) is based on a Symmetric Input-Output Table (SIOT) for 2008 which follows ESA95, which compared to Blake et al., (2003) provides a more updated assessment of the impact of tourism-related industries. Cassar (2015) constructed an industry-by-industry SIOT for Malta for the year 2008, based on the fixed production sales structure assumption. In his study, Cassar (2015) was able to derive industry specific multipliers based on the input-output methodology framework at a highly disaggregated 59 industry level. In the absence of tourism satellite accounts, the industries that we consider to be an "integral" part of tourism are the land transport, water transport, air transport, and accommodation and food services activities. It is important to note, that there may be elements within these industries that do not specifically pertain to the tourism industry. Furthermore, elements of the tourism industry may be included in other sectors of the economy, but are not included as part of this analysis.

The value added multipliers generated by Cassar (2015) for the four sectors identified as representative of the tourism sector in Malta are reproduced in Table 2 below and are utilized to compute a weighted average tourism multiplier[8] in order to allow a comparison with the estimate presented within Blake et al. (2003). Notwithstanding the differing reference years of the datasets utilized, and to an extent the methodologies applied, both multiplier estimates seem relatively consistent.

[7] A summary of the full set of multipliers relating to the tourism related sectors derived by Blake et al. (2003b), including the employment multipliers, may be found in Appendix Table 2.

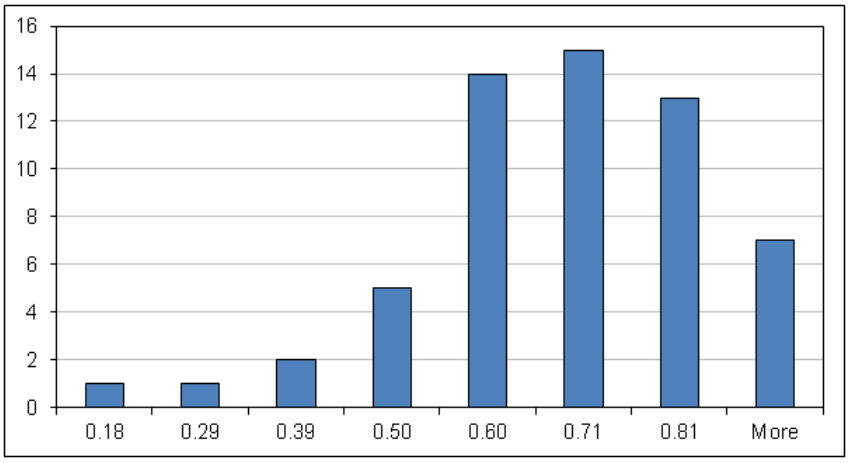
[8] The weighted average tourism multiplier is derived by multiplying each individual industry value added multiplier to the sectors' proportional percentage share of GVA (or weighting) and aggregating across the respective four sectors.

Table 2: A Comparison of Tourism GVA Multipliers based on Cassar (2015)

	GVA in 2008	Weight (%)	GVA Type I Multipliers	GVA Type II Multipliers
Land Transport and transport via pipelines	55,455	14.7	0.69	0.88
Water Transport	18,714	4.9	0.52	0.71
Air Transport	47,589	12.6	0.46	0.74
Accommodation and Food Services	256,813	67.8	0.65	0.93
Total	378,571	100		
2008 Weighted Average Tourism Multiplier			**0.63**	**0.89**

The analysis by Cassar (2015)[9] allows us to compare the multiplier effect of tourism-related industries with other industries present in the Maltese economy and thus provides a ranking. At 0.63, the weighted average of the tourism-based industries suggests slightly below average value added multiplier (i.e. average is equal to 0.64). Figure 1 illustrates the frequency distribution of Type I value added multipliers in the Maltese economy.

Figure 1: Frequency Distribution of Type I GVA Multipliers



Source: *Estimates of output, income, value added and employment multipliers for the Maltese economy by Dr. Ian Cassar (2015)*

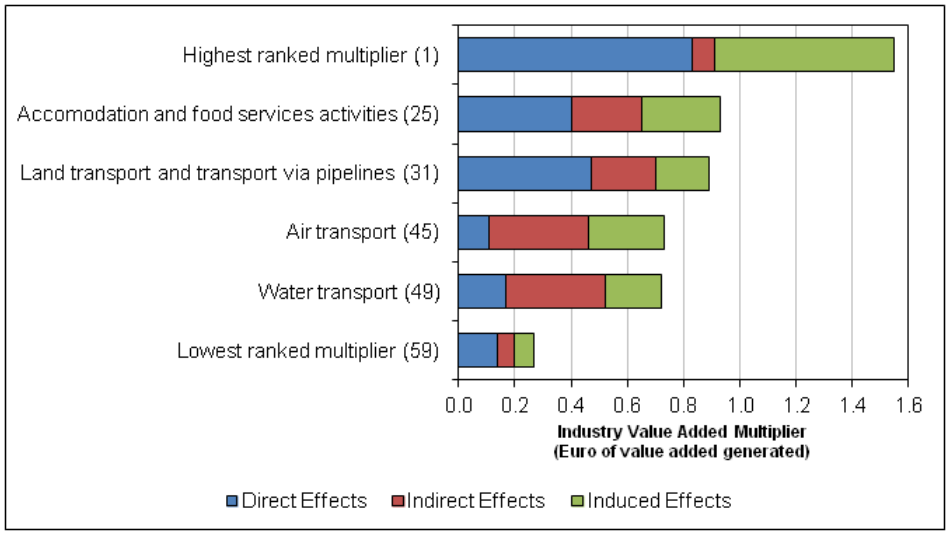
Type I value added multiplier for land transport is ranked amongst the median of the

[9]For the purpose of his study, Cassar (2015) also derives the respective output, employment and income multipliers. A summary of the full set of multipliers relating to the tourism related sectors, including the Type I and Type II income and employment multipliers, may be found in Appendix Table 2.

various industry output multipliers, with a value of 0.69. This means that a 1 Euro increase in final demand for land transport would generate on average €0.69 value added in the economy. From this total amount, €0.47 is generated directly within this sector, whereas €0.23 is derived from indirect effects. The same level of ranking can be attributed to the accommodation and food services activities, with a Type I multiplier value of 0.65, made up of a high direct effect of 0.40, and a slightly lower indirect effect of 0.25. On the other hand, despite a relatively high output multiplier, both water transport and air transport exhibited rather low value added multipliers. Water transport generated a value added multiplier of 0.52, made up of 0.35 indirect effects and 0.17 direct effects, whereas air transport generated a multiplier of 0.46, of which 0.35 are attributed to indirect effects, and 0.11 to direct effects. The latter two sectors had amongst the lowest ranked direct effects, but at the same time had amongst the highest ranked indirect effects reflecting the significant linkages with the rest of the economy.

When one also considers the induced effects it is interesting to note that the industry ranking by strength of Type II value added multipliers improves significantly in the case of accommodation and food services and in air transport, reflecting their labour intensity of production. Figure 2 illustrates the value added multipliers of the tourism related industries.

Figure 2: 2008 Value Added Multipliers*



Source: *Estimates of output, income, value added and employment multipliers for the Maltese economy by Dr. Ian Cassar (2015)*

* *The numbers in the brackets represent the rankings of the Type II multiplier.*

4.3 Industry Linkages and Multipliers in Tourism derived from a SIOT for 2010

In May 2016 the National Statistics Office (NSO) published "Supply, Use and Input-Output Tables 2010" which presented the first official SIOT for Malta, since the SIOT for 1996 which was published in the *National Statistics 1998* by the National Statistics Office of Malta. This publication also presented a set of Type I output and value-added multiplier derived utilizing the SIOT for 2010. It should be noted that in contrast to the SIOT utilized by Cassar (2015), which was based on ESA95 methodology, the SIOT for 2010 compiled by the NSO follows ESA2010 methodology. The methodological changes implied by ESA2010 could potentially have a significant impact on the supply and use system, the volume of exports and imports and underlying inter-industry linkages (Sixta et. al., 2014 and Van den Cruyce, B. ,2014). This implies that the multipliers presented within NSO (2016) may, to an extent, not be strictly comparable to those derived in Cassar (2015). Furthermore, it should be acknowledged that in contrast to the study undertaken by Cassar (2015), which utilized a 59 level of sectoral disaggregation, the multipliers presented by NSO (2016) are based on a highly aggregated SIOT of 17 sectors, hence caution has to be exercised when comparing multipliers for the seemingly same industry category due to possible differences in the underlying sectoral classification.

Given the high level of aggregation presented in the input-output analysis provided by NSO (2016), it was only possible to identify two industries which may be considered to be an "integral" part of tourism, namely the transport sector and hotels and restaurants sector. It is important to note that the aggregated sector for transport incorporates all the activities which fall under the classification of land transport, sea transport, air transport, warehousing and support activities for transportation and postal and courier activities and thus may not necessarily reflect the expenditure patterns of solely tourism related activities. Table 3 illustrates the value added multipliers of the tourism related industries as presented within NSO (2016) together with the derived weighted average tourism value added multiplier.[10]

The Type I value-added multiplier for the hotels and restaurants sector of 0.63 and that of 0.56 for the Transport sector implies an increase of €0.63 and €0.56 in value added generated, respectively, per Euro increase in the final demand for each sector. In terms of their overall ranking, the hotels are restaurants sector is ranked 10^{th} and the transport sector is ranked 14^{th} which would indicate an average to low impact when evaluated within the context of a sectoral aggregation equal to 17 industries. It is interesting to note however that the Type I value added multiplier for the hotels and restaurants sector is only marginally lower than that obtained from Cassar (2015), indicating some level of

[10] The weighted average tourism multiplier is derived by multiplying each individual industry value-added multiplier to the sectors' proportional percentage share of GVA (or weighting) and aggregating across the respective two sectors.

Table 3: A Comparison of Tourism GVA Multipliers based on NSO (2016)

	GVA in 2010 (Million Euro)	Weight (%)	GVA Type I Multipliers
Transport	346.2	56	0.56
Hotels and Restaurants	272.4	44	0.63
Total	618.6	100	
2010 Weighted Average Tourism Multiplier			0.59

Source: NSO (2016)

stability across time. Given the classification utilized for the aggregation of the transport sector, which also includes warehousing and support activities for transportation and postal and courier activities, the value added multiplier for this sector should not be directly compared to the individual multipliers for the other transport sectors derived in Cassar (2015).

4.4 Evaluating the contribution of tourism to the Maltese economy based on studies utilizing input-output methodology

This section presents estimates for the contribution of tourism to the Maltese economy which are derived utilizing the multipliers obtained from the aforementioned three input-output studies. As illustrated in Table 1, as part of their study Blake et al.(2003) generated figures for the contribution of Tourism, as a percentage of GDP, based on their obtained multipliers which were of 9.5 per cent (direct contribution), 12.3 per cent (direct and indirect), 17.1 per cent (direct, indirect and induced) and 29.5 per cent (direct, indirect, induced and government interacting). As mentioned earlier, the contribution of 29.5 per cent is derived based on indirect, direct, induced and government interacting multiplier estimates which invoke some very rigid assumptions pertaining to the behaviour of the economy which could potentially lead to unrealistic and overvalued multiplier estimates.

Utilizing the weighted average tourism multipliers derived utilizing the results obtained from Cassar (2015) and NSO (2016) estimates for contribution of tourism to the Maltese economy, as a percent of total GVA where obtained for each multiplier type following equation (1.1):

$$C_t = \left(\frac{WATM_t \, X \, TE_t}{GVA_t} \, X \, 100 \right) \quad (1.1)$$

Within this evaluation, the contribution of tourism to the Maltese economy (C_t), for the given reference year of the input output table (t), is defined as the total expenditure by tourists[11] (TE_t), for the same year, multiplied by the applied weighted average tourism value added multiplier $(WATM_t)$ and expressed as a percentage of the total GVA of the respective reference year of the input-output table. The results are presented in Table 4.

Table 4: Input-Output based estimates of the contribution of tourism to the Maltese Economy

	Blake at a. (2003) (% of GNP for 2001)	Cassar (2015) (% of total GVA for 2008)	NSO (2016) (% of total GVA for 2010)
Direct and Indirect (Based on Type I multipliers)	12.3	12.5	11.5
Direct, indirect and induced (Based on type II multipliers)	17.1	17.7	N/A

Sources: Blake et al. (2003), Cassar (2015), NSO (2016).

From Table 4 it is very interesting to note that, notwithstanding the divergences in methodologies and time elapsed between 2001 and 2010, the results obtained from the three input-output based studies all seem to corroborate a direct and indirect contribution to the Maltese economy equal to approximately 12 per cent of total GVA. Furthermore, observing the Type II value added multipliers, which in the case of Cassar (2015) are based on the computed Type II weighted average tourism value added multiplier, which include induced effects, we note further constancy between the two studies with a contribution of tourism at around 17 per cent of total GVA. It is noteworthy that Oosterhaven, Peik and Stedler (1986) assert that a realistic estimate of direct and indirect effects of an increase in final demand on the economy commonly lies approximately half way between the Type I and Type II multipliers. Within the context of assessing the true contribution of tourism to the Maltese economy on the basis of the input-output studies just discussed this would imply that a realistic contribution of the tourism sector to the Maltese economy would lie in the range of 12 per cent to 17 per cent of total GVA.

[11] Figures provided by the Malta Tourism Authority.

5. The contribution of tourism based on the methodology employed by the World Travel Tourism Council (WTTC)

One of the most widely referenced studies relating to the contribution of tourism to the Maltese Economy is the Travel and Tourism Economic Impact 2015 Malta Report issued by the WTTC (2015). Input-Output methodology is used to estimate travel and tourism contributions to GDP and employment. It should be noted, that the WTTC employs certain assumptions regarding the application of their input-output methodology which contrasts significantly with the previous studies discussed in section 3. Furthermore, it should be noted that the WTTC (2015) study did not utilize a fully specified Input-Output table for Malta for the derivation of the multiplier estimates, but applied technical coefficients obtained from the input-output tables of other countries where data was incomplete. It is important to point out that there is no indication of the country source of the input-output matrices which were applied to Malta. This is why the WTTC estimates are being evaluated in separate section within this paper.

The WTTC definition of what constitutes Travel and Tourism activity differs from the definition applied by Blake et al. (2003). In the 2015 WTTC methodology, Travel and Tourism is defined as being *"the activity of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not remunerated from within the place visited."* This implies that the WTTC is including domestic travel and tourism in estimating the contribution of tourism to the Maltese economy, which in part explains the higher contribution and different multipliers than those discussed Section 3. But the most significant difference appears to relate to the multipliers employed which in turn are not based on published input-output matrix estimates for Malta.

The differences highlighted above provide an explanation for the significant variances which emerge between WTTC tourism's direct and indirect contribution of 23.8 per cent and total contribution of 28.1 per cent (which includes direct, indirect and induced effects) of GDP, estimated via input-output methodology, for 2014. It is evident that these estimates seem rather disproportionate in comparison to what has been was estimated separately by Blake et al (2003) for 2001, Cassar (2015) for 2008 and NSO (2016) for 2010.

6. Computable General Equilibrium Modelling of Tourism Impacts

Since the 1990's, most applied studies on the economic contribution/impact of tourism generally centre around two main methodologies, the application of an Input-Output model and/or the application of a Computable General Equilibrium (CGE) model. CGE models[12] overcome several of the limitations and constraints which are inherent in input-output modelling and go beyond traditional Input-Output models in that they link sectors via economy-wide constraints. CGE models are economic models that use actual economic data to estimate how an economy might react to changes in policy, prices, taxes, technology or other external factors. They are an extension of Input-Output models, but assign a more important role to prices and elasticities, thus incorporating changing behavioural effects. It is noteworthy, that the application of CGE models generally requires the use of a Social Accounting Matrix[13] (SAM), which is an extension of the input-output table.

It is often argued that studies which make use of Input-Output modelling tend to overstate the true economic contribution of tourism (Frechtling and Smeral ,2010). Studies by Blake et al. (2003) and Sinclair et al. (2005) which make use of CGE models to estimate the impact of tourism on the Maltese economy, support this hypothesis. In the second part of the study by Blake et al. (2003), a CGE model was built around the same data of the input-output model, but incorporating an economic model allowing for behavioural changes in wages, prices, expenditure patterns and variable input proportions. Similar analysis but in more depth was undertaken by Sinclair et al. (2005), but a limitation of their study was the absence of a fully specified SAM.

Table 5 shows the overall effects of a 10 per cent increase in the 2001 tourism demand (equivalent to Lm32 million). It is clear that significant crowding out can occur from tourism expansion when proper account is taken of behavioural effects. The results indicated that in the short-run, for every Lm32 million of additional demand, only Lm18.8 million was spent in Malta, thus implying that a proportion of the stimulus from the increase in tourism demand is crowded out by higher prices. High elasticity of demand by tourists is a significant contributor to this crowding out. In the long-run, far less is crowded out primarily because there is greater labour and capital mobility between economic sectors to meet the additional demand (it improves from Lm18.8 million up to Lm29.1 million). This increase in extra demand also led to an increase in the GDP for Malta. However, this effect is greater in the short-run due to the crowding out effect through labour constraints in the long-run, thus suggesting that the supply constraints in the labour market were deemed to hamper the industry's ability to fully meet the additional tourism demand.

[12] For further reading on the application of CGE analysis towards tourism impact assessment see Dwyer, et al., (2003) and Narayan, (2004).

[13] For further reading on the interpretation and uses of a SAM refer to Pyatt and Round (1985).

Table 5: Stage 2 Report (2003) - CGE model

Malta (2001)	Short-Run (1-2 years)	Long-Run (3-5 years or longer)
Change in Tourism Expenditures		
Million Lira	18.876	29.158
% of original	5.9	9.1
GDP		
Million Lira	9.443	7.533
% of original	0.6	0.5
Multiplier		
GDP (Million Lira)	0.296	0.236

Source: Blake et al. (2003)

GDP multipliers stood at 0.296 and 0.236 for the short-run and long-run, respectively, which when compared to those resulting from the input-output analysis clearly illustrate the extent to which the input-output framework can overstate the true contribution of an industry. When comparing solely with the GNP multiplier obtained by Blake et al. (2003) at the direct and indirect level in the input-output analysis (equivalent to 0.63), the multipliers obtained in the CGE model decline by more than half. Therefore, it may be noted that the results derived within the first part of the study which were based on input-output analysis seem to have overstated the level of contribution to GDP emerging from increased tourism expenditure. The results obtained through the use of a CGE model applied incorporates numerous constraints not included in traditional input-output modelling, such as the assumption of free labour and capital mobility and substitution in tourism-related industries (Frechtling and Smeral, 2010). This implies that the GDP multipliers from the CGE analysis derived in the second part of the study may to an extent be viewed as more robust given that they are based on a model which better captures economic reality. However, when comparing these results to the multipliers obtained from the other studies discussed within the paper one has to acknowledge the data limitations, especially the lack of a fully specified SAM, which underpin the estimates of Blake et al. (2003). Furthermore, the actual level of labour mobility facilitated by recent labour migration trends suggests that the CGE analysis may also contain some excessive restrictions which may underestimate the multiplier effect of tourism in Malta.

7. Conclusion and recommendations

The objectives of this paper were twofold. Firstly, to provide a critical overview and comparative assessment of the key studies which have been undertaken over the recent decades with the aim of empirically quantifying the impact and contribution of the tourism sector on the Maltese economy. Secondly, in attempting to identify and clarify the main discrepancies which emerge from the various studies assessed, this paper also aimed to shed further light on what could possibly be a realistic range of the impact of the tourism sector on the Maltese economy.

The construction of the first set of tourism satellite accounts for the Maltese economy by Sacco (2016) allows for an assessment which is based on the measurement of solely tourism activities. Sacco (2016) estimates the GVA generated by the tourism sector at 5.7 per cent of the total GVA. This estimate however neglects the indirect and induced effects which are generated as a result of tourism activities.

The results from input-output models estimate the direct and indirect contribution of tourism at around 12 per cent of GVA. Estimates by Blake et al (2003), Cassar (2015) and NSO (2016) corroborate these findings. On the basis of the Type II value added multipliers derived by Cassar (2015), the induced effects raise the potential contribution to approximately 17 per cent of GVA. This analysis has also shown that the WTTC estimates, which are typically quoted to justify the high contribution of tourism at approximately 30 per cent, seem to be rather excessive compared to estimates by NSO (2016), Cassar (2015) and Blake et al. (2003) even when they include the induced effects. Furthermore, it should be noted that the figures estimated in the WTTC (2015) for Malta, unlike the other input-output based studies discussed in this paper, are based on some rather strong assumptions which were required due to lack of available data.

At a sectoral level, an analysis of the three input-output studies assessed in this paper indicates that the tourism-based industries (namely accommodation, food and transport services) are firmly interlinked with other sectors of the economy in general, such that the tourism-based industries generate relatively high value added multiplier effects compared to many manufacturing-based industries in Malta. Nevertheless, such multiplier effects are not amongst the highest in the Maltese economy and are closer to the median observed and quite typical of a service-based industry.

Notwithstanding the importance of input-output analysis as a tool for assessing and monitoring the size and evolution of tourism activity over time, more sophisticated models exist, such as CGE models, which better capture the underlying economic reality. Such models allow for the relaxation of certain assumptions made by input-output models such as wage and price rigidities as well as those relating to supply constraints. The results obtained by both Blake et al. (2003) and by Sinclair et al. (2005), which apply

CGE modelling to the Maltese economy in order to estimate the impact of tourism, suggest that the tourism multipliers derived from traditional input-output models could be overestimated. It is however important to evaluate the results obtained from the various studies discussed in this paper keeping in mind the numerous discrepancies which exist between each study in terms of statistical methodologies employed and overall data quality.

The analysis undertaken within this paper indicates that there is significant need for further research in this area. The WTTC estimates which generally associate a contribution of tourism to the Maltese economy of approximately 30 per cent clearly seem overestimated compared to: the direct contribution of at 5.7 per cent of total GVA estimated by Sacco (2016) via the construction of a TSA for Malta, the approximate 12 per cent of direct and indirect contribution and the roughly 17 per cent of direct, indirect and induced contribution based on the input-output studies assessed in this paper. However, even the direct and indirect contribution of 12 per cent of total GVA may possibly also be overvalued if one considers that the tourism value-added multipliers generated for the Maltese economy from studies based on CGE models. These are nearly half those obtained from traditional input-output studies. These observed discrepancies thus indicate that there is need for further applied research on this topic.

Applying the currently published data (NSO, 2016) to more sophisticated input-output models such as in Cai et. al. (2006) could provide a better understanding of the underlying linkages of the tourism sectors with the non-tourism sectors and thus help comprehend the impact of tourism on the production structure of the Maltese economy. Furthermore, the development and publication of an official complete TSA framework for Malta would help to better comprehend the direct impact which tourism-related activities have on the Maltese economy. Furthermore, an extension of the NSO (2016) input-output table for 2010 into a SAM would allow for the application of CGE models which would enable researchers to shed more light on the effective direct, indirect and induced contribution of the tourism sector on the Maltese economy.

Appendix Tables

Appendix Table 1: Main Tourism Indicators

	2013	2014	2015	Absolute Change (2015/2014)	% Change (2015/2014)
Total Inbound Tourists	1,582,153	1,689,809	1,791,422	101,612	6.0
Total Nights Spent	12,890,268	13,522,112	14,217,158	695,047	5.1
Average Length of Stay (nights)	8.1	8.0	7.9	-0.1	-1.2
Cruise Passengers*	424,566	465,373	591,682	126,309	27.1
Total Expenditure (€000s)	1,440,379	1,528,765	1,643,945	115,179	7.5
Total Expenditure per capita (€)	910	905	918	13.0	1.4
Average full-time employment in accommodation and food services activities**	10,103	10,396	10,686	290	2.8

* Excluding embarkations and Maltese cruise passengers.

** The data presented is based on the distribution of the administrative records of the ETC of the gainfully occupied population according to the standard NACE classification of economic activities.

Source: National Statistics Office, Employment and Training Corporation

Appendix Table 2: Tourism Multipliers

No.	Sectors	Direct Effects		Indirect Effects		Type I Multiplier (Direct + Indirect Effects)		Induced Effects		Type II Multiplier (Direct + Indirect + Induced Effects)	
		Direct Effects	*Rank*	*Indirect Effects*	*Rank*	*Type I*	*Rank*	*Induced Effects*	*Rank*	*Type II*	*Rank*
Output Multipliers											
29	Land transport and transport via pipelines	-	-	-	-	1.53	22	0.45	45	1.95	40
30	Water transport	-	-	-	-	1.81	3	0.44	43	2.25	16
31	Air transport	-	-	-	-	1.79	4	0.61	21	2.41	10
34	Accommodation and food services activities	-	-	-	-	1.63	12	0.62	20	2.25	15
Value Added Multipliers											
29	Land transport and transport via pipelines	0.47	27	0.23	17	0.69	27	0.19	45	0.88	31
30	Water transport	0.17	54	0.35	3	0.52	45	0.20	43	0.71	49
31	Air transport	0.11	56	0.35	1	0.46	54	0.27	21	0.74	45
34	Accommodation and food services activities	0.40	25	0.25	11	0.65	31	0.28	20	0.93	25
Income Multipliers											
29	Land transport and transport via pipelines	0.14	46	0.11	24	0.25	45	0.08	45	0.33	45
30	Water transport	0.10	52	0.16	4	0.26	43	0.08	43	0.34	43
31	Air transport	0.19	31	0.17	3	0.36	21	0.12	21	0.48	21
34	Accommodation and food services activities	0.24	21	0.12	14	0.37	20	0.12	20	0.49	20
Employment Multipliers											
29	Land transport and transport via pipelines	20	10	7	5	27	12	5	45	32	17
30	Water transport	4	53	9	8	13	48	5	43	19	47
31	Air transport	5	52	8	15	14	47	7	21	21	41
34	Accommodation and food services activities	15	23	7	12	23	19	7	20	30	21

Source: Estimates of output, income, value added and employment multipliers for the Maltese economy by Dr. Ian Cassar (2015)

Appendix Table 3: Tourism Multipliers

2001 Sectors	Direct	Direct + Indirect	Direct + Indirect + Induced	Direct + Indirect + Induced + Government Interacting
GNP Multipliers				
Accommodation	0.538	0.752	1.113	2.015
Restaurant	0.487	0.639	0.900	1.797
Car Hire	0.369	0.685	0.992	1.771
Air Malta	0.297	0.412	0.595	1.119
Other Services	0.413	0.474	0.683	1.102
Goods	0.375	0.535	0.825	1.399
Total	0.486	0.625	0.873	1.503
Employment Multipliers				
Accommodation	62.046	85.861	112.001	178.191
Restaurant	62.962	77.927	96.837	162.692
Car Hire	42.415	79.201	101.412	158.609
Air Malta	13.809	48.078	61.330	99.773
Other Services	46.267	53.517	68.582	99.357
Goods	30.139	47.286	68.324	110.418
Total	42.225	61.292	79.221	125.474

Source: The Economic Impact of Tourism in Malta: Input-Output Modelling by Dr. Adam Blake, Professor M. Thea Sinclair and Dr. Guntur Sugiyarto (Report for the Malta Tourism Authority August 2003b)

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