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Connecting quality of life, tourism specialization, and economic growth in small island destinations: The case of Malta

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HIGHLIGHTS

- The relationship between tourism specialization and economic growth is not self-evident in Malta.
- Tourism specialization does not have a significant direct impact on economic growth.
- The interaction between tourism specialization and investment is negative.
- The interaction between tourism specialization and quality of life is negative.
- Tourism specialization suggests signs of diminishing returns over time with economic growth.

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ABSTRACT

This study assesses the relationship between quality of life (QOL), tourism specialization, and economic growth as applied to small island destinations. The study is grounded on a QOL model and translog production function and employs the limited information maximum likelihood estimator to investigate the nature of this relationship in Malta. Results indicate that the relationship between tourism specialization and both QOL and economic growth is only partial. Tourism specialization improves the residents QOL but, only on the short term. The study enhances the existing empirical evidence of the literature that examines the relationship between tourism specialization and residents' QOL in the medium- and long-term in that it controls for endogeneity. The translog production function methodology is novel as it allows for examining tourism returns and the factors that shape tourism preferences. This permits supply and demand variables to be combined into a production and consumption system.

1. Introduction

The purpose of this study is to examine the relationship between quality of life (QOL), tourism specialization, and economic growth in the context of small island destinations. While researchers have studied the relationship between tourism specialization and economic growth in specific countries (Brau, Lanza, & Pigliaru, 2007; Balaguer & Cantavella-Jordá, 2002; Croes, 2011; Eugenio-Martin, Martin, & Scarpa, 2004; Lanza & Pigliaru, 2003; Neves & Maças, 2008), and while study results have generally indicated this relationship to be positive, the manner in which increased income derived from tourism specialization affects residents' QOL is unclear. That is, while tourism specialization may spur more income in households, businesses, government, and the economy at large, the manner in which income affects residents' QOL is imprecise. Moreover, more income may benefit a few at the expense of others. Consequently, *a priori* assessment becomes inconceivable as to whether income effects, induced by tourism specialization, will have positive effects on residents' QOL.

Quality of life can be defined as a person's life satisfaction or dissatisfaction, happiness or unhappiness, or sense of psychological or subjective well-being (Dolnicar, Lazarevski, & Yanamadram, 2013; Kim, Woo, & Uysal, 2015). Thus, QOL is a multidimensional concept referring to objective conditions, such as health, education, and income, as well as subjective assessment of those objective conditions revealed in a person's life experience. Quality of life for the purpose of this study is defined as the material and non-material aspects of life based on utility measurements and anchored in Sen's capabilities approach (Sen, 1999). Derived from

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the investigation of Ranis et al., (2000), this study identifies two distinct causal chains that could characterize the nexus between tourism specialization and QOL. The first pertains to the freedom of people to choose the course of their own well-being. That is, enlarging people's choices should be seen as the central objective of human activity (Sen, 1999) because this process fosters creativity and productivity, which are among the main determinants that give rise to output and exports' growth. The second is in the recognition that tourism specialization may spawn the resources needed to sustain QOL, such as jobs, opportunities, improved infrastructure, and social services.

The tourism literature identifies QOL as the ultimate goal of tourism development, according to Croes (2012a, 2012b), Chancellor, Yu, and Cole (2011), and Ritchie and Crouch (2003) echoing the development literature (Easterly, 1999; Krugman, 1991). This view characterizes QOL as a passive agent of tourism development. However, recent studies have shown that this is not necessarily the case in an environment where residents' QOL can also affect tourism and economic development (Ridderstaat, Croes, & Nijkamp, 2016). Residents have a vested interest in any economical tool, including tourism development, which can improve their QOL, even if they are not directly employed in the tourism industry (Chancellor et al., 2011; Kim, Uysal, & Sirgy, 2013).

There is vast literature regarding tourism and the QOL connection. The majority of the studies can be categorized into two groups. The first entertains a narrow focus on QOL by equating it to income. This group's underlying premise is that wealth is correlated with QOL (Croes & Rivera, 2010; Kenny, 2005). Sen (1999) and others have contested the uni-dimensional conception of QOL, positing that QOL is about enlarging peoples' available choices to pursue the lifestyle they value. The second group pertains to studies that survey residents' perception of tourism's impact on various QOL domains within their own or community life, and is mainly grounded in social exchange theory (Andereck & Nyaupane, 2011; Andereck, Valentine, Vogt, & Knopf, 2007; Ap, 1992; Figini & Vici, 2010; Perdue, Long, & Gutske, 1991).

Two main concerns may be articulated against the second group. Core domains of the subjective approach have been incommensurate with individuals' consistent choices and learning experience, and seem more related to circumstances and the satisfaction of others rather than revealing their life preferences (Kahneman & Krueger, 2006). That is, as people adapt to the circumstances of their life experiences and situations, they may reason that their condition is agreeable (Ridderstaat et al., 2016; Sen, 1999). Moreover, the focus of these studies targets only one point in time thereby not considering medium- and long-term impacts of tourism on QOL.

This study will only focus on the objective domains of QOL (not on its subjective domains). Specifically, QOL is measured by the Human Development Index (HDI), which measures QOL through three dimensions: long and healthy life, education, and income, and thus captures more information than the one-dimensional, standard income measures. Despite the relevance of QOL in understanding development, this topic has been neglected in small island destination studies. This study answers two interrelated questions: (1) Does tourism specialization positively influence residents' QOL in small island destinations? (2) Can tourism specialization sustain residents' QOL? These questions will be addressed in the context of Malta, a Southern European island country comprising an archipelago of a few Mediterranean Sea islands. Thus, this study is anchored in a case study approach. Case study approaches are applied when a social phenomenon is explored and when studies aim at providing theoretical propositions rather than engaging in statistical generalizations (Ying, 2009).

This paper's contribution is fourfold. First, it adds empirical evidence to the literature that examines the relationship between tourism specialization and residents' QOL in the context of small islands. Second, the applied methodology is novel in that it allows for examining the nature of tourism returns, as well as the interaction of factors that shape tourism preferences. Thus, the methodology combines supply and demand variables in a comprehensive production and consumption system that connects to human well-being, following Sen's capability approach. In other words, the production and consumption system is assessed in terms of the opportunities it creates for people to live valuable lives. Enhancement of human well-being thus relies on the resource base of economic activity which consists of production, the use of that production (consumption), and the effect of that consumption.

Third, the study provides new insights into the dynamics of tourism specialization as it impacts QOL, and the concomitant public policy options available to small island destinations. And fourth, the study provides a constructive replication of the study by Holzner (2011) by decomposing the variables into a trend (long-term) and cycle (short-term) components and assesses the replicability of the findings. Constructive replications are key for establishing the external validity of the findings of a study and are vital to the accumulation of scientific knowledge (Colquitt & Zapata-Phelan, 2007).

2. Literature review

Given increased competitiveness between countries and regions, tourism specialization has become vital toward identifying each area's unique characteristics and assets, and in highlighting their competitive advantages (Pérez-Dacal, Pena-Boquete, & Fernández, 2014). Neves and Maças (2008) indicated that more researchers were focusing on the relationship between tourism specialization and economic growth, and that tourism specialization had a positive and significant effect in many economic areas: for example, GDP, labor conditions, and education levels (Fernández, Pena-Boquete, & Pereira, 2009; Urtasun & Gutiérrez, 2006; Yang, 2012). The tourism-led growth literature claims that tourism specialization spawns economic growth (Algieri, 2006; Arezki, Cherif, & Piotrowski, 2009; Pérez-Dacal et al., 2014; Ridderstaat et al., 2016). This literature strand posits that small countries and small islands have a comparative tourism advantage, and that tourism through trade enlarges the small market through increased demand for international tourism (Algieri, 2006). The growth potential of tourism is revealed through increased terms of trade (ToT). The empirical evidence corroborates these theoretical propositions because small islands, despite the pessimistic predictions of the endogenous growth theory, were able to grow (Brau et al., 2007; Croes, 2011, 2013; Holzner, 2011; Lanza & Pigliaru, 2003; Narayan, Narayan, Prasad, & Prasad, 2010; Seetanah, 2011).

Small islands seem particularly prone to engage in tourism specialization because they entertain a smaller opportunity cost of specialization (Croes, 2011); and it is convenient for smaller sized islands to specialize in tourism (Algieri, 2006). Additionally, the combination of two elasticity phenomena (high income elasticity and price elasticity ambiguity) contribute to relatively stable export earnings of tourism products compared to commodity groups benefiting the ToT of destinations specializing in tourism. While tourism demand studies have played a prominent role in identifying the determinants of tourism flows, these studies have not provided sufficient empirical evidence regarding the sustainability of tourism specialization and its impact on residents' QOL in small island destinations. Tourism development may be a temporary occurrence and its development may not be sustainable, or tourism impact may change over time based on tourism's developmental stages (Kim et al., 2013), or demand elasticities may fluctuate over

time (Smeral, 2012). The reason for the temporal issues related to tourism may be that growth is induced by the intensive and increasing use of one production factor in small island cases: natural resources. Once this factor's employment reaches its maximum use, labor productivity becomes crucial in determining growth, and, as a result, tourism countries may grow more slowly than others. From this perspective, tourism may not be a viable development path in the long-term.

Algieri (2006) investigated the long-term benefits associated with tourism specialization and found that productivity, human capital, and output per employee grew faster in manufacturing than in tourism, which raises the issue of sustainability of tourism specialization. This finding begs the question as to whether there are limits to tourism growth. Adamou and Clerides (2010) addressed this issue and found that tourism specialization was associated with higher rates of economic growth at relatively low specialization levels, and tourism's contribution would become minimal at higher specialization levels. Figini and Vici (2010) also investigated tourism's specialization sustainability. In their study, which focused on 1990–2005; they found no statistically significant relationship between tourism specialization and economic growth. According to this study, tourism specialization has a higher impact on economic growth at lower than higher specialization levels, suggesting that tourism is not beneficial over time. Palmer, Ibañez, and Gomez (2005) also reached a similar conclusion in the sense that tourism cannot be expanded forever.

However, a number of studies contest such results. Durbarry (2004) applied a cointegration technique to Mauritius and found that tourism had promoted growth, having a significant positive impact on Mauritian economic development. Katircioglu (2009) found a long-term bi-directional relationship between tourism and economic growth for Malta. Ridderstaat, Croes, and Nijkamp (2014) confirmed Katircioglu's (2009) findings, using Aruba as a case study. Croes (2011) and Holzner (2011) also found consistent results supporting the Durbarry, Katircioglu, Ridderstaat, and Croes' previous studies' findings. Holzner (2011) investigated a sample of over 130 countries over nearly four decades. He found that tourism-dependent economies were experiencing higher average economic growth rates and therefore did not face diminishing returns. Croes (2011) applied a panel analysis to a large sample of small island destinations, finding that tourism specialization triggers economic growth in the long run, and tourism specialization did not entertain diminishing returns.

Economic growth has an important bearing on the QOL of residents, according to the development literature (Easterly, 1999; Kim et al., 2013). Applied studies have been scant in going beyond considering the pure income effects on QOL in the long-term with a few notable exceptions. Croes (2012a, 2012b) examined this relationship for Nicaragua and Costa Rica from 1990 to 2009 through a cointegration analysis, and found mixed results. Biagi, Ladu, and Royuela (2015) applied a panel for 63 countries from 1996 to 2008, and found that tourism is positively related to QOL, in particular education. Ridderstaat et al. (2016) applied an ARDL bounds testing approach to examine the relationship between tourism and QOL for Aruba from 1975 to 2010, and found non-linear and bidirectional dynamic relationships between these two constructs. These three studies, however, reveal inconsistent results with regard to the short- and long-term impacts of tourism. For example, the Biagi et al. (2015) report indicates short-as well as long-term effects between tourism and QOL, while Ridderstaat et al. (2016) only discovered short-term effects. In response to the Biagi et al. (2015) call to investigate the relationship between tourism specialization and QOL through other methodologies, this study examines the dynamic relationship running from tourism specialization to QOLin the context of Malta.

The focus on tourism specialization and income is too narrow in the context of small island destinations. While economic growth is relevant to development, income is not the only important measure of human conditions and life opportunities as it is too narrow to measure QOL (Stiglitz, Sen, Fitoussi, 2009). If QOL is the ultimate goal of tourism specialization, then understanding its nature as revealed in the small island development context is crucial for the destinations' socio-economic future. This is because small island destinations cannot afford many costly development trials and errors given their scant resources and economic opportunities. The relationship between tourism specialization and QOL becomes an empirical question if scarce resources are to be deployed wisely to ensure residents' QOL. It is also important to understand any existing limits to the extent that tourism specialization can sustain growth and enhance QOL (Adamou & Clerides, 2010; Croes, 2011) Therefore, this study discusses QOL beyond its instrumental value (income) and claims that a much broader and comprehensive set of information is required to assess QOL.

QOL is operationalized either uni-dimensionally or multi-dimensionally in terms of specific domains considered separately, or in terms of overall life satisfaction (Ryff & Keyes, 1995). It can also be measured from the multiple material and non-material dimensions that shape and define human experience (Easterlin & Angelescu, 2012; Stiglitz et al., 2009). QOL is captured by both objective and subjective indicators. Objective indicators are those that are independent of a person's control and include income, basic needs, and capability, while the subjective indicators capture self-reporting accounts of individuals' happiness or satisfaction with a list of capabilities, functionings, or needs (Stiglitz et al., 2009). Both objective and subjective paradigms struggle with the question of whether development makes life better.

The main critique of the subjective well-being approach is that feelings and emotions are a mental appraisal of an objective condition, but not the condition itself. Individuals are socially able to adapt to their situation and thus may perceive satisfaction with their life. So, basing policy on that adaptation could have undesirable repercussions on residents' QOL. Because an individual is able to socially adapt to his or her situation, grounding policy based only on one's own satisfaction with life could have undesirable repercussions on residents' QOL. Understanding objective conditions that may trigger QOL, as well as understanding how these conditions are related to tourism specialization, is a crucial step in calibrating realistic developmental choices for small island destinations. This study, therefore, focuses on the objective QOL conditions, and not the individual's experience.

The objective QOL paradigm consists of two schools of thought: the income paradigm and the capability approach. The income paradigm claims that higher incomes are associated with healthier and more educated people. The dissatisfaction with the income paradigm spawned by the abysmal deprivation of millions of people resulted in the capability approach. This approach (Sen, 1999) has claimed that the income paradigm does not capture all the important human experience dimensions. Instead, it has promoted the idea that QOL is a combination of motivation and opportunities. Motivation, opportunities (capability) to convert resources into functionings (which equals achievements), and the freedom to choose, to take action, and to seize opportunities is the crux of this approach (Croes, 2012a, 2012b).

However, the tourism literature has been relatively silent in investigating whether tourism specialization makes small island destination life better. Croes' (2011) study explored this issue and found no significant association between tourism specialization and QOL while unearthing an indirect relationship between the two constructs. Because fixed effects methods may conceal important information regarding the individual behavior in a group

environment, this study looks closely at one particular case to discern more insights into the dynamic relationship between tourism specialization and QOL.

This study adopts Croes' (2011) study and expands the results by examining the island of Malta.

The analysis of this study will focus on three sets of propositions:

Proposition 1: Tourism specialization propels economic growth.

Proposition 2: Tourism specialization sustains economic growth.

Proposition 3: Tourism specialization improves the residents' QOL.

3. Malta

Malta is a mature destination with over fifty years in tourism development. Tourism has grown significantly over time representing in 2014 as much as 28.1% of the gross national product and providing 29.1% of all jobs. Tourism arrivals and receipts have increased steadily over time. Arrivals increased from 783,900 in 1988 to 1,689,800 in 2014, while receipts increased from US$435 million to US$1.52 billion during the same time span (World Bank Group, 2016). Malta is also an affluent island destination. Its real economic output increased from US$3.25 billion in 1988 to US$7.8 billion in 2014 (World Bank Group, 2016). The destination reveals a high QOL (2014: 0.839) and a real GDP per capita of US$18,432 (2006 = 100) of 2014, ranking 37 among 186 countries (UNDP, 2015).

Despite these numbers, the destination went through a reinvention process when its competitive position in the Mediterranean region eroded. In the early 2000s, the destination repositioned and leveraged itself as a heritage mecca. This shift from a sun, sand, and sea product created lingering concerns regarding its sustainability and the management effectiveness of its tourist assets (Blake, Sinclair, Sugiyarto, 2003; Chapman & Speake, 2011; Dodds & Butler, 2010; Foxell & de Trafford, 2010; Graham & Dennis, 2010). Concerns also were related to the diminishing yield of its offerings and the increasing costs involved in the offerings' production.

To face these challenges and to allay growing concern about its competitiveness, the Ministry of Tourism, Culture and the Environment (2013) outlined a strategic vision to target and invest in attracting international tourist markets that deliver highest returns on investment. Malta is also increasingly focused on the delivery of high-quality tourism services and products to ensure high levels of visitors' satisfaction. The government of Malta has been installing tourism policies that could support measures to bring social economic benefits to the island and add value to islanders (Ministry of Tourism, 2014). Environmentally, it is important that tourism improves the synergy between the environment and tourism, give added value to both the built and natural heritage, and achieve a better QOL in all its urban areas (Minister of Tourism, Culture and the Environment, 2013). These policy intentions and actions have not been able to reveal whether Malta's tourism specialization spawned diminishing or increasing returns to the destination, or whether tourism specialization has enhanced residents' QOL.

4. Methodology

The study applied a translog production model to examine the link between tourism specialization and economic growth. This type of model is widely used in the empirical analysis of the production structure of many companies and industries (Kim, 1992). The translog production model has two main advantages over other production functions. First, it is not grounded in rigid assumptions such as perfect substitution between production factors and perfect competition as revealed in the Cobb-Douglas production (Douglas, 2006). Second, it facilitates the examination of nonlinear production patterns, thereby including dynamic aspects of tourism production. The study applies a Limited Information Maximum Likelihood regression technique to determine the nature of the relationship between tourism specialization and the QOL.

The model was partially derived from Holzner (2011), whereby output (Y) is a function of physical capital (K), human capital (H) and tourism specialization (T):

$$Yt = f(K_t, H_t, T_t) \quad (1)$$

where t represents time.

By including squared and interaction variables of the independent variables to investigate the nonlinearity and interface properties of the data, the model can be presented as follows:

$$Y_t = \alpha_1 K_t + \alpha_2 H_t + \alpha_3 T_t + \alpha_4 K^2{}_t + \alpha_5 H^2{}_t + \alpha_6 T^2{}_t + \alpha_7 K_t H_t + \alpha_8 K_t T_t + \alpha_9 H_t T_t + \varepsilon_t \quad (2)$$

where

K^2, H^2, T^2 = squared variables.
KH, KT, HT = interaction variables.
ε = error term.
α = coefficients.

The second model applied in this study is that where QOL is a function of human capital and tourism specialization:

$$QOL_t = f(H_t, T_t) \quad (3)$$

Including squared and interaction variables, the model looks as follows:

$$QOLt = \alpha_{10} H_t + \alpha_{11} T_t + \alpha_{12} H^2{}_t + \alpha_{13} T^2{}_t + \alpha_{14} H_t T_t + \varepsilon_t \quad (4)$$

The applied variables are included in Table 1. The gross domestic product (real terms, 1995 = 100) is used as a proxy for Y, in line with Dwyfor Evans et al. (2002), Kim and Lau (1994), and Pavelescu (2011). The source for this information is the World Economic Outlook database of the International Monetary Fund (IMF, 2015). K is proxied by the real investments (1995 = 100), derived from data provided by the IMF (IMF, 2015). H is proxied by the average years of education of people aged 25 and older (converted from education attainment levels using official durations of each level), and the data is derived from the United Nations Development Program (UNDP, 2015). This is the most widely acknowledged interpretation of human capital (Kubic, 2010).

As proxies for tourism specialization, the study applied four types of indicators. Tourism specialization is measured in four different ways, whereby the four indicators are subsequently combined using the principal components technique.

The first tourism specialization proxy was the ratio between nominal tourism receipts and the gross domestic product, (an indicator frequently used in literature). The source of the data is the IMF's World Economic Outlook together with the Tourist Board of Malta (IMF, 2015). The second tourism specialization proxy is the total travel and tourism contribution to GDP, based on calculations by the World Travel and Tourism Council (WTTC, 2014). The third tourism specialization proxy is the ratio between tourism receipts and exports, again calculated by the WTTC (WTTC, 2014). The fourth proxy of tourism specialization is the ratio between the

Table 1
Variable description.

Variable	Description	Mean	Median	Maximum	Minimum	Standard Deviation
LRGDP	Logarithm of real gross domestic product (2005 = 100)	1.6746	1.5690	2.0891	1.1809	0.2720
LINV	Logarithm of the real investments (1995 = 100)	3.1478	3.1398	3.5115	2.7537	0.2149
LHUMCAP	Logarithm of mean years of schooling (of adults) (years)	4.3603	4.3656	4.4055	4.3135	0.0265
LTOURSPEC1	Logarithm of tourism specialization (ratio of tourism receipts to GDP)	2.9285	2.9549	3.2921	2.5878	0.1916
LTOURSPEC2	Logarithm of tourism specialization (travel and tourism total contribution to GDP)	3.3616	3.3069	3.6610	3.1180	0.1614
LTOURSPEC3	Logarithm of tourism specialization (tourism receipts in % of exports)	3.1064	3.0587	3.4500	2.7663	0.2472
LTOURSPEC4	Logarithm of tourism specialization (tourism arrivals in % of total population)	5.7027	5.7048	5.9844	5.4346	0.1241
LHDI	Logarithm of Human Development Index	−0.2538	−0.2588	−0.1755	−0.3257	0.0478

Source: World Bank Group (2016), IMF (2015), UNDP (2015), World Travel and Tourism Council (WTTC) (2014).

numbers of visitors and is shown as a percent of the total population.

According to Pérez-Dacal et al. (2014), the literature has defined multiple indicators of tourism specialization, each of them measuring a particular feature of tourism. However, there is no consensus regarding which of these indicators is the best to use, and so they develop a composite indicator of several measures (using principal component analysis) that summarizes tourism specialization without losing the multidimensionality characteristics. A study by Biagi, Ladu, and Royuela (2016) found that a composite indicator rather than single variables would be better in capturing the effect of tourism on the human development indicator. The approach in the current study is similar, i.e., producing a one-dimensional indicator of tourism specialization that contains the multidimensional characteristics of the four individual measures applied in this investigation, using the principal component analysis technique to create the composite indicator. This technique transforms a group of variables into either a smaller number of variables, or a completely new set of composite variables (or principal components) that are not correlated with each other (Cooper & Schindler, 2011). A popular criterion for selecting the components is by looking at eigenvalues larger than 1 (Wold, Esbensen, & Geladi, 1987).

For QOL, the study used the HDI statistic produced by the United Nations. The collected data for this research are from 1988 to 2014, implying 27 data points. The authors transformed all data to logarithm, among others, to comply with the requirement of the translog production function.

Further analysis of Table 1 suggests that the mean and median of the logarithm data are very close to each other, indicating that the data may be, to some extent, evenly spread above and below the central tendency. Furthermore, the maximum and minimum values, as well as the standard deviation indicate that the data may contain some volatility degree.

Table 2 shows that there is only one component that complies with this norm (eigenvalue = 2.9574, which is equal to the product of the 4 variables and the explained variance). This component explains slightly more than 73.9% of the total variation in the data. For the purpose of this research, the final tourism specialization variable is calculated as the sum of each of the four tourism specialization variables and its respective eigenvector.

Preliminary analysis using the annual data, reveals large coefficients outcomes, which could be a sign that the model is over-interpreted. One possible solution to this problem is to reduce the number of variables included in the model. However, this approach would downgrade the usefulness of the translog production function. Instead, the study applied a data decomposition strategy, whereby the data is divided into a long-term (trend) component and a short-term (cyclical) component, and the model is thus applied in two separate data frameworks. This would provide an indication of the long- and short-term behavior of the data. For this purpose, the authors used the Hodrick Prescott filter to decompose the data into a trend and a cycle component, whereby the size of the lambda ($\lambda = 6.25$) was set in line with Ravn and Uhlig (2002) in order to achieve an acceptable calculation of the trend and cycle components out of annual data. To make the data comparable, the authors standardized both trend and cycle components and the results are provided in Fig. 1. Decomposition provides a clear picture of the nature of the development of the total variables (short- and long-term).

The next step is to determine whether the data (both trend and cycle series) is stationary or non-stationary, and at what level. Thus, the study applies the Augmented Dickey–Fuller test (ADF), the Phillips–Perron test (PP) and the Kwiatkowski–Phillips–Schmidt–Shin test (KPSS) (Dickey & Fuller, 1979; Kwiatkowski, Phillips, Schmidt, & Shin, 1992; Phillips & Perron, 1988). The KPSS, according to authors such as Jafari, Othman, and Nor (2012) and Pao, Fu, and Teng (2012), is often used to complement the ADF and PP tests to obtain robust results. In addition, the authors applied the Ng-Perron test (Ng & Perron, 2001) to further complement the other unit root tests.

Subsequently, the study applied the Limited Information Maximum Likelihood estimator (LIML) to determine the influence of each of the independent variables on Y and QOL. This procedure uses *a priori* information pertaining only to the equation(s) whose parameters' estimation is of interest (Dhrymes, 2012). The LIML has been suggested by Hayashi (2000), Poi (2006), and Stock, Wright, and Yogo (2002), and in cases where the sample size was small (also known as the finite-sample property). Tests based on this approach are also far more robust than weaker instruments that are based on two-stage least squares (Stock and Yogo, 2005). Prior to this application, the study tested whether these independent variables were not endogenous, meaning that the unobserved factors, represented by the error term, were not systematically related to the regressors (Gujarati, 2014). According to the Gujarati, if a single regressor in a multiple variable regression is correlated with the error term, then the estimates of all the coefficients should be

Table 2
Principal components results.

	Eigenvalue	Variance explained	Cumulative variance explained
Component 1	2.9574	0.7393	0.7393
Component 2	0.9409	0.2352	0.9746
Component 3	0.0608	0.0152	0.9898
Component 4	0.0409	0.0102	1.0000

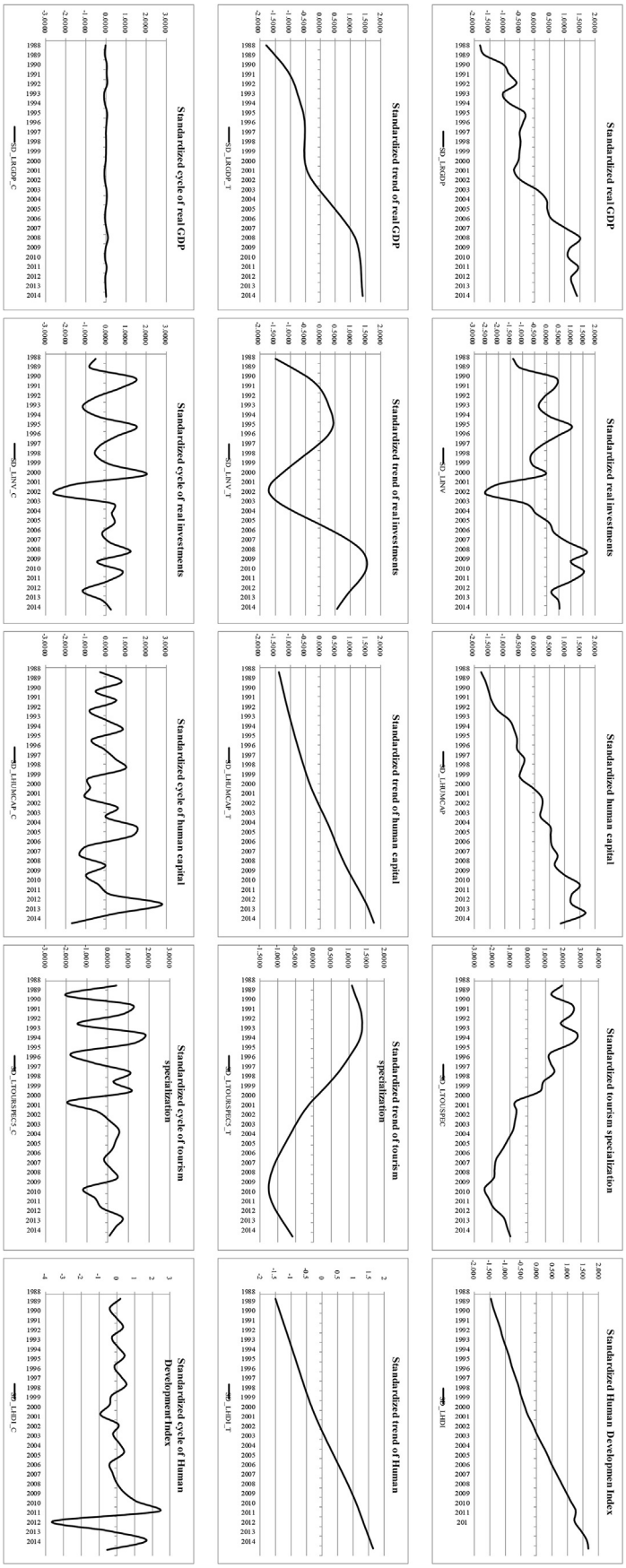

Fig. 1. Standardized cycles and trends.

considered inconsistent. So, for this purpose, the study tested the independent variables for endogeneity using a three-step procedure: Firstly, the authors regressed the dependent variables on the independent ones using simple ordinary least squares regression. Secondly, the authors calculated the residual from the regression, and, thirdly, calculated the coefficient of correlation (R) between this residual and the independent variables. If the R was significant ($p < 0.1$), then the variable(s) of concern was/were considered as endogenous.

After the endogenous variables had been identified, the study proceeded with the LIML analysis. The instruments used in the analysis consisted of two main groups. The first group related to instruments that were to some extent positively or negatively correlated to the endogenous variables, which is in line with Gujarati (2014). The second group of instruments consisted of lagged versions of the applied endogenous variables, which is an approach based on Hall (1988), Hansen and Singleton (1983), Murray (2006), and Yogo (2004).

5. Results

Unit root test results are provided in Table 3 (trend variables) and Table 4 (cycle variables). The outcomes suggest that all the variables were stationary at the level form, whereby the study employed this data type in the further analysis. Table 5 shows the result of the correlation test for both the trend and cycle components of the first model. The '**' and '***' signs in the table indicate the variables that were significantly correlated with the error term in the translog production function. The trend variables were found to be endogenous for real investments, human capital and tourism specialization as were the interaction variables of, respectively, investment-human capital and investment-tourism specialization (Table 5). For the relevant cycle variables, this was the case with real investments only. The findings imply that instrumental variable analysis is required for both trend variables and relevant cycle variables.

Table 5
Correlation between independent variables and error term (translog production function).

	Trend	Cycle
	R	R
LINV	0.6892***	0.8242***
LHUMCAP	0.9742***	−0.1779
LTOURSPEC	−0.8890***	−0.1113
$LINV^2$	0.2187	−0.2414
$LHUMCAP^2$	0.2763	−0.1639
$LTOURSPEC^2$	−0.0822	−0.2060
LINV x LHUMCAP	0.4255**	0.0698
LINV x LTOURSPEC	−0.4139**	0.1816
LHUMCAP x LTOURSPEC	−0.0402	0.0126

Note: *** and ** indicate, significance at, respectively, 1% and 5%.

Following the findings from the endogeneity tests, the study estimated the trend and cycle components of the translog production, using LIML. Because the data was standardized, no intercept component was needed, given that in a regression with standardized variables the intercept term is always zero (Gujarati & Porter, 2009). The results are revealed in Table 6. In the case of the trend (or long-term) component of the variables, the results show that real investments and human capital are highly significant (1%), meaning that both variables have a long-run positive impact on economic output. However, the squared version of the human capital variable came out significant and negative, indicating that this effect is not linear but concave - the latter meaning that the effect of human capital on real gross domestic product diminishes over time. Moreover, the interaction between real investment and

Table 3
Unit root test results (trend component).

		ADF	PP	KPSS	Ng-Perron				Result
					MZa	MZt	MSB	MPT	
LRGDP	Level	−4.2353**	−1.9152	0.0913 *	−6.7888	−1.799	0.2650	13.448	I(0) or I(1)
	First difference	−3.3513*	−1.8421	0.1179*	−39.3425***	−4.4318***	0.11265***	2.33429***	
LINV	Level	−4.2005***	−1.8677	0.1038*	−22.9483**	−3.3815**	0.14735**	4.00515**	I(0) or I(1)
	First difference	−3.5627*	−1.8366	0.0941*	−901.8440***	−21.2342***	0.02355***	0.1020***	
LHUMCAP	Level	−1.9811	−1.7651	0.2044***	−96.3493***	−6.90555***	0.07167***	1.07764***	I(0)
	First difference	−2.1368	−1.4504	0.1016*	−4.3332	−1.07783	0.24874	17.7426	
LTOURSPEC	Level	−1.6553	−0.8948	0.1285**	−31.5112***	−3.83705***	0.12177***	3.61743***	I(0) or I(1)
	First difference	−1.6790	−0.9479	0.1935*	−48.8588***	−4.89802***	0.10025***	2.08201***	
LHDI	Level	−3.1850	−1.8423	0.1765***	−28.4244***	−3.76383***	0.13242***	3.2405***	I(0) or I(1)
	First difference	−2.9759	−0.9809	0.1376**	−38.4605***	−4.33795***	0.11279***	2.61756***	

Note: *, **, and *** indicate significance at, respectively, 1%, 5%, and 10%.

Table 4
Unit root test results (cycle component).

		ADF	PP	KPSS	Ng-Perron				Result
					MZa	MZt	MSB	MPT	
LRGDP	Level	−6.2886***	−8.9280	0.5000	−43.1049***	−4.64158***	0.10768 ***	2.11851***	I(0) or I(1)
	First difference	−6.7820***	−10.3054	0.3087	−35.7539***	−4.22546***	0.11818***	2.56298***	
LINV	Level	−6.0699***	−8.5342	0.5000	−43.1216***	−4.64242***	0.10766***	2.11803***	I(0) or I(1)
	First difference	−5.5998***	−11.3642	0.1894	−0.6780	−0.5690	0.83925	128.9930	
LHUMCAP	Level	−5.5147***	−3.9833	0.1072*	1.2192	2.7773	2.2780	1136.3900	I(0) or I(1)
	First difference	−4.6219***	−8.2960	0.1743***	−11.8982	−2.37166	0.19933	8.0013	
LTOURSPEC	Level	−3.6732**	−14.0049	0.2751	−26.5912***	−3.64611***	0.13712***	3.42805***	I(0) or I(1)
	First difference	−4.3476**	−15.5792	0.1722*	−10.1889***	−2.25069***	0.2209***	8.97184***	
LHDI	Level	−6.0711***	−14.4720	0.2812	−43.3832***	−4.6489***	0.10716***	2.14383***	I(0) or I(1)
	First difference	−4.4755***	−16.4970	0.1757***	−49.5203***	−4.93173***	0.09959***	2.05431***	

Note: *, **, and *** indicate significance at, respectively, 1%, 5%, and 10%.

Table 6
Translog production function regression results (Trend & Cycles).

	Dependent = LRGDP_T	Dependent = LRGDP_C
LINV	0.1966 ***	0.4138 ***
LHUMCAP	0.9537 ***	0.1383
LTOURSPEC	0.0145	−0.8436
$LINV^2$	0.0062	0.0043
$LHUMCAP^2$	−0.1073 ***	−0.0045
$LTOURSPEC^2$	0.0489 **	−0.0089
LINV x LHUMCAP	−0.1127 ***	−0.0038
LINV x LTOURSPEC	−0.0703 ***	0.0220 **
LHUMCAP x LTOURSPEC	0.0122	0.0099
Underidentification test (H_0: equation is underidentified)		
Kleibergen-Paap rk LM statistic ($\chi 2$)	12.1380 (p = 0.0069)	9.7350 (p = 0.0831)
Weak identification test (Shea's partial R^2)		
SD_LINV_T	0.9239	
SD_LHUMCAP_T	0.9211	
SD_LTOURSPEC_T	0.9187	
SD_LINV_T_LHUMCAP_T	0.8809	
SD_LINV_T_LTOURSPEC_T	0.8901	
SD_LINV_C		0.6588
Overidentification test all instruments (H_0: variables are exogenous)		
Sargan's statistic	0.0010 (p = 0.9997)	3.6860 (p = 0.4502)

Note: ***, ** and * indicate, significance at, respectively, 1%, 5% and 10%.

human capital was also negative in the long run, suggesting that both variables are substitutes of each other. Tourism specialization was not significant in the model outcome, and, thus, has no immediate effect on economic output. This finding supports that of Adamou and Clerides (2010) in the case of Cyprus, but contradicts the findings from the studies of Biagi et al. (2015), Croes (2011), Holzner (2011), Katircioglu (2009), and Ridderstaat et al. (2016).

While the connection between tourism specialization and economic growth in Malta was insignificant, the squared version of this variable was positive and significant, indicating a convex relation with economic output. In other words, the influence of tourism specialization is increasing in the long-run, though not to a statistically significant measure. The latter may reflect the problem of low productivity in the tourism sector. The interaction between real investments and tourism specialization was significant, but negative, implying that tourism and investment seem to substitute for each other. This result is inconsistent with the findings of Holzner (2011) who found signs of complementarity between tourism specialization and investment in traditional physical capital. The case of Malta seems to suggest that the destination has reached a dangerous saturation point, plausibly involving a mismatch between product and market, carrying capacity, and sustainability concerns. Therefore, propositions 1 and 2 cannot be fully supported; in other words, tourism specialization, at least in the case of Malta, only marginally propels and sustains economic growth.

The study also tested the regressed models for possible underidentification, weak instrumentation, and for over-identification of applied instruments. The Kleibergen-Paap rk LM statistic was statistically significant, indicating the null hypotheses of underidentification are rejected. The Shea partial R^2 was higher than 0.88 for all applied instruments, indicating that the used instruments were not weak. Furthermore, the Sargan statistic was not significant, and, therefore, could not reject the null hypothesis that the independent variables were exogenous (applied instruments did not cause an over-identified equation).

In the case of the cyclical (short-term) components of the variables, the results show a significant (1%) positive outcome for investments, indicating that the latter has a positive short-term impulse on economic output. Moreover, there is a statistically significant (5%) positive result of an interaction of investment with tourism specialization, meaning that both variables are the complement of each other in the short run. The Kleibergen-Paap rk LM statistic was statistically significant, indicating that the equation is not under-identified. The Shea partial R^2 was higher than 0.65 for the applied instruments, indicating again that these instruments were not weak. An additional Cragg-Donald Wald F statistic test confirmed this finding (Cragg-Donald Wald F statistic: 5.020, which is higher than the Stock & Yogo (2005) critical values (10%: 4.840; 15%: 3.560; 20%: 3.050; 25%: 2.770)). The Sargan statistic was statistically insignificant, meaning that, once more, the applied instruments did not contribute to an over-identified equation.

The study finally examined the dynamic relationship between tourism specialization and QOL. The correlation test results of the QOL model are shown in Table 7 and indicate that in the case of the trend variables both human capital and tourism specialization were significant, and, thus, endogenous; and in the case of the cycle variables, both tourism specialization and squared human capital were deemed endogenous. The results from Table 7 indicate that instrumental variable analysis was again required. Following the findings from the endogeneity tests, the study applied the LIML again on both the model's trend and cycle components, and the results are revealed in Table 8. In the case of the long-run regression, all independent variables showed statistically significant outcomes.

Human capital is quite important for long-term QOL development in Malta. However, this circumstance is not linear, but diminishing over time considering the negative value of the

Table 7
Correlation between independent variables and error term (quality of life model).

	Trend	Cycle
	R	R
LHUMCAP	0.9973***	−0.0739
LTOURSPEC	−0.9216***	0.4550**
$LHUMCAP^2$	0.2851	−0.4676**
$LTOURSPEC^2$	−0.2328	−0.3077
LHUMCAP x LTOURSPEC	0.0495	0.3082

Note: *** and ** indicate, significance at, respectively, 1% and 5%.

Table 8
Quality of life model regression results (Trend & Cycles).

	Dependent = LHDI_T	Dependent = LHDI_C
LHUMCAP	1.0046 ***	−53.1784
LTOURSPEC	−0.0246 *	109.2268 *
$LHUMCAP^2$	−0.0448 **	−0.2706
$LTOURSPEC^2$	0.0522 ***	−0.2206
LHUMCAP x LTOURSPEC	0.0510 **	0.4056
Underidentification test (H0: equation is underidentified)		
Kleibergen-Paap rk LM statistic ($\chi 2$)	9.1780 (p = 0.0102)	12.7700 (p = 0.0779)
SD_LHUMCAP_T	0.7318	
SD_LTOURSPEC_T	0.6858	0.8693
SD_LHUMCAP_T_SQ2		0.9343
Overidentification test all instruments (Ho: variables are exogenous)		
Sargan's statistic	0.0080 (p = 0.9272)	6.9030 (p = 0.3299)

Note: ***, ** and * indicate significance at, respectively, 1%, 5% and 10%.

squared human capital variable, which suggests that the relationship is concave. Tourism specialization has a significant negative long-term effect (at the 10% significance level) on QOL, but this effect is fading and could even turn around over time, given its convex structure, reflected in the positive and significant coefficient of its squared variable. Therefore, proposition 3 cannot be rejected. The statistics of model adequacy showed that the model was not under-identified or over-identified, while the applied instruments were also not weak. The short-term results show that tourism specialization has a statistically significant impact on the QOL of residents of Malta (providing an additional argument for not rejecting proposition 3), and the model adequacy statistics showed that the estimated equation was suitable.

Overall, the results show that the production structure of Malta, as described by the translog model, as well as residents' QOL, are dynamic in nature when considering the data's long-term and short-term dimensions.

6. Conclusion and recommendations

This study examined the nature of the relationship between tourism specialization and residents' QOL in the context of a small island with a focus on Malta. Small islands have limited development options and tourism seems to be a vehicle that could help small islands overcome scale constraints. Because human development is considered the hallmark of development, the impact of tourism specialization on residents' QOL becomes a quintessential concern. Thus, the study entertained three propositions: (1) Tourism specialization propels economic growth; (2) Tourism specialization sustains economic growth; and (3) Tourism specialization improves the QOL of citizens. While propositions 1 and 2 could not be fully supported, proposition 3 could not be rejected.

The study's results entertain four important conclusions. First, the relationship between tourism specialization and economic growth is not self-evident. Tourism specialization does not have a significant direct impact on economic growth, which is inconsistent with other studies based on the tourism-led growth hypothesis (TLGH). One potential reason for this discrepancy is that most TLGH studies are based on time series variations that may be corrupted with potential endogeneity in the level of tourism specialization in growth regressions. Consequently, these studies may be overestimating the impact of tourism specialization and economic growth. Inputs such as managerial skills and quality of the institutions, which are unobserved, may play a significant role in spawning economic growth and tourism expansion. Second, the interaction between tourism specialization, investment, and human capital is negative implying that marginal effects of investments in the tourism product may be spawning low returns, while the tourism products seem to be suffering from decaying productivity in the sector. Human capital seems to entertain diminishing returns, and appears to have substitute effects when interacting with tourism specialization. Third, tourism specialization does suggest signs of diminishing returns over time in the case of economic growth in Malta. This result is consistent with the findings of Adamou and Clerides (2010) for Cyprus. And fourth, tourism specialization seems to have a resolved relationship with QOL for Malta: it is significant in the short run and suggests increasing returns in the long run.

The results, therefore, suggest three main managerial implications. First, the relevance of tourism receipts is related to the question of how receipts are generated, rather than on how much receipts should be generated in order to induce economic growth. If tourism specialization has an impact on household incomes only through human capital, and if there is an ambiguity between tourism specialization and economic growth, then it begs the question regarding what type of tourism dynamics may have spawned this situation. There may be three dynamics working synergistically in the case of Malta: offerings of low value-added content attracting the wrong tourist segments, a growing presence of foreign workers with high remittances that could have negative repercussions on economic growth (Baas and Melzer, 2012) and which could depress wages affecting the purchasing power of locals (Olney, 2013), and high presence of part-time jobs due to seasonality effects.

Second, household incomes are less associated with health and education; allocation is more related to public resources implying a role of government in the allocation and distribution of resources. One explanation for the previous result may well be in the definition of the HDI. Life expectancy, which is contingent on the adequacy of health care and the level and quality of education, is mainly affected by public expenditures and less by household expenditures. Tourism provides jobs, salaries, and income, and through these items taxes to the government. Taxes received from tourism are converted into government expenditures and a portion of these expenditures is allocated as resources in improving human development. The amount of resources and the way these resources are allocated within the human development sectors have an impact on the degree of improvement in human development. In small islands, government expenditures have a larger impact on health care and education than household expenditures. In other words, the importance of tourism lies in the way that its benefits are distributed among people, and the extent to which its expansion supports public services.

Third, human development seems key to tourism development. Investment in human capital is required for the delivery of quality offerings and services to tourists. Tourism suffers from a productivity gap with regards to other industries, which increases its production costs over time. To compensate for this increase, tourist offerings and services are required to entertain higher prices. Yet, higher prices are only possible through high-quality tourist offerings, which require industry's capacity and capability to deliver new and innovative products and services. High competencies, skills, and creativity from human resources are crucial ingredients undergirding the future sustainability of the tourism sector in small island destinations.

The conclusions warrant four policy considerations. First, this

study suggests that context matter and that, therefore, small island destination managers should not automatically follow the best practice approach. Different contexts may require different solutions. The policy methodology should be undergirded by a diagnostic rather than a presumptive approach. The diagnostic approach should be imbued with information that discovers what works in a small island destination. Second, to discover what works, a small island destination cannot simply rely on an expanding list of best practices. Rather, the destination works in a policy setting that is a high dimensional and evolving space with many specific interactions. These interactions are too intractable for anyone to keep track of considerations regarding the production of new offerings in the tourism industry which requires coordination, the self-discovery of costs, and the finding of workers with the experience. This highly dimensional policy setting requires information diffused throughout the tourism system.

Third, because the tourism system is fragmented, the search for what works demands an open architecture approach that includes all destination stakeholders. Stakeholders in the private sector possess information regarding productive opportunities and obstacles and could help design an effective selection mechanism to discover what works. The private sector can reveal information to the government promptly whereupon the government could act effectively. One practice that could enhance effectiveness is benchmarking which meticulously measures and compares performance. This mechanism supports a process of open-ended search for improvements. Here, finding the right performance measures of how to make human capital more supportive of the tourism industry is crucial.

And fourth, innovation should direct the coevolution process of production and capability. The cornerstone of this direction should center on innovativeness, which includes products, services, processes, and overall business strategies. The open architecture approach consists of four key elements—policy that guides the coordination of initiatives, organization and management embedded in transparency, linkages among stakeholders, and service delivery— that together aim at increasing consumer surplus (memorable experiences), the profitability of firms, and productivity of the tourist sector. The effectiveness of any government's intervention will ultimately be assessed by its impact on productivity that increases the total resources to enhance the small island destination's quality of life.

7. Limitations and future research

The results of this study may be due to stylized circumstances associated with the case reviewed. Other cases at a different tourism life cycle may spawn different results. In addition, the small number of observations (23) applied in the Limited Information Maximum Likelihood regression analysis may have unduly affected the results. A larger sample may yield more precise results, while also considering other approaches to cycle decomposition, such as the Christiano-Fitzgerald band-pass filtering technique (Christiano & Fitzgerald, 1999). Another issue to consider is the use of a multidimensional construct. Quality of life consists of material (e.g., income) and non-material dimensions (e.g., health) that may cancel each other out. For example, tourism specialization may generate more household income; members of those households may endure more stress, lack sleep, and suffer from other impairments. An in-depth subjective well-being investigation could complement the objective well-being approach as a future research strategy in order to get deeper insights into the nature of the relationship between tourism specialization and QOL. Future research should also examine the proximity or overlap of the subjective and objective approaches of well-being.

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