Reprint from the Conference proceedings: 8th ENTRE 2016, Advancing research in entrepreneurship in the global context, (with Juraković, L.), Krakow, Poland, (ed.) Wach, K., Zur, A., 7-8 April 2016, pp. 953-969,
http://www.conference.uek.krakow.pl/2016/proceedings.html

CHAPTER 7

KALDOR'S INCOME DISTRIBUTION AND TOURISM SPECIALIZATION: EVIDENCE FROM SELECTED COUNTRIES

1. Introduction

The issue of income distribution linked to specialization can be viewed from various angles, but a formal analysis inevitably abstracts from details and tries to capture the most relevant aspects of the issue at hand. A Kaldorian hypothesis about income distribution and specialization put forward in this paper is one of the alternative perspectives.

The main hypothetical conjecture in this paper is that tourism leads to profit-led growth in economies. In an open economy that is fully specialized in providing tourism services to foreigners that sector is often the main instrument of economic growth. Many studies have found that most countries are wage-led domestically and that the larger economies (including the US and the EU as a whole) are wage led overall, while some smaller or

https://doi.org/10.2478/9783110628548-008

more open economies (including some individual EU members) are profit led once foreign trade is taken into account (e.g., Onaran and Galanis 2013).

Thus, the primary focus of this paper is to observe the contributions from the use of basic production factors, labour and capital in the aggregate output, which is based on the calculation at the end of the fiscal year and on realised income, as well as to measure the impact of tourism development in this regard.

In this paper, we propose and conduct a simple empirical test that examines the consequences of tourism development and specialization within a given circle of a relatively homogenous group of economies based on Kaldor's theory of income distribution. Using data from the Extended Penn World Tables 4.0 and simple panel regression analysis, our test strongly rejects the prediction of Kaldor's theory in the group of Mediterranean countries that have substantial tourism activity. The rest of this paper is organised as follows. The next section gives a brief discussion of the tourism-income distribution schedule according to Kaldor's theory, an important device used in the empirical approach. In the subsequent two sections, we derive the Kaldorian condition regarding how tourism demand impacted profit shares in terms of income distribution; these sections draw heavily on Candela and Figini (2013). In the penultimate section, we outline our empirical strategy, conduct the empirical analysis and present the main results. The last section concludes the discussion.

2. Literature review

It is difficult to relate our results to the existing literature because, apart from Marcouiller, Kim and Deller (2004), who examine the performance of the tourism sector

and the distributional mechanisms of aggregate amenity-led economic growth for the US lake states, the relationship between income distribution and tourism specialization across the various regions has not been studied. The distributional consequences of the growth through tourism have not been investigated (Pant, 2011). So, it is very difficult to compare, the drawn conclusions from a set of our aggregate data that are leaning on modified Kaldor's theory of income distribution, to conclusions of other authors.

There are a number of case studies examining the relationship between Kaldor's theory of income distribution and economic conditions in certain aspects, see e.g. Soon Ryoo and Yun K. Kim (2014) who extend Kaldor's theory of income distribution to include workers' debt accumulation and their motive to emulate rentiers' consumption. Cook (1995) made effort to develop a cross-country test for the existence of Kaldor effects in less developed countries in regard income distribution. In paper of Dünhaupt (2014) several theoretical approaches explaining functional income distribution are summarized among them the Kaldor's too. In light of the different theoretical stances, this paper reviews the empirical literature on potential explanations for the prolonged fall since the 1980s, the share of wages in national income in almost all countries over the world. Palely (2013) in his theoretical paper presents a Kaldorian model of growth that incorporates both Kaldor's theory of income distribution and his endogenous technical progress function. Based on the assumptions of the neo-Keynesian distribution theory and using an information-theoretic approach, Das and Martin (2012) in their paper derive the distribution of income between income units. The paper of Ryoo (2014) examines the effects of changes in aggregate demand on income distribution in a stock-own consistent model of a corporate economy with two classes. The model has a main Kaldorian feature: income distribution is determined endogenously by the level of aggregate demand.

A large body of literature inspired by the seminal contribution of Marglin and Bhaduri (1988) has debated the distributional determinants of demand and growth. A general conclusion has been that open economy considerations weaken the potential for a wage-led growth regime (Razmi,2014). As for the role of profit in growth (the focal point in our paper), Bhaduri and Marlgin call profit-driven pattern of growth an "exhilarationist" regime (1990). This type of growth benefits not only capitalists but also unemployed workers through the creation of new jobs. Job creation, however, is achieved at the expense of the average real wages of those who are already employed (Molero-Simarro, 2013).

'Income shares' or 'factor shares' refer to the shares of national income that reward the different factors of production. Because they are related to the macroeconomic functioning of economies, they are typically measured from aggregate data. Labour share "*shows how much of national income accrues to labor"* (Lübker, 2007). Krueger (1999) notes that the types of computations used to determine income shares force income into two artificial categories: labour and non-labour, with the latter strongly linked to capital shares. In reality, however, there are many different types of labour *"labor and capital no longer divide so neatly into mutually exclusive categories"* (Krueger, 1999) - and each economic agent derives its earnings from multiple different sources. Thus, factor shares are very important for studying the functioning of economies, both the economies of the Mediterranean band and those of some European countries.

Owing to the predominance of tourism development strategies in the Mediterranean rim countries, it is interesting to focus on the practical question of whether exaggerated tourism development (and hence specialization) in these countries determines a specific income distribution structure considering the dichotomy between labour and capital.

To our knowledge, we repeat there has not yet been any systematic attempt to assemble a common database and study the conceptual issues linked to the empirical trade-off between level of tourism development and income distribution among labour and capital recipients according to Kaldor's theory of income distribution. However, some papers address that issue from the different angles at which the concept can be studied. Blake et al. (2009) developed a computable general equilibrium (CGE) model of Brazil's tourism that includes earnings by different types of labour in the tourism industry, households with different income levels, and the channels through which tourism alters the income distribution between households with different income levels. In low-income countries, the use of tax revenues to fund tourism promotion is motivated in part by the belief that tourism growth will improve income distribution by expanding the demand for relatively low-skilled labour. The authors examine this opinion for the case of Thailand, a highly tourism-intensive economy, using a specifically designed applied general equilibrium model (Wattanakuljarus, Coxhead, 2008).

3. Material and methods

3.1. The Model

Conventionally, national income accounting identities are employed to expose the links between final output consumption, e.g., government budget balance, and the trade balance, among others. The model we use for the empirical study is a panel regression model based on a slightly corrected Keynesian open economy model. In a Keynesian open economy model, gross domestic product Y is the sum of private consumption expenditures C; gross private domestic investment expenditures I; government expenditures G; and net exports EX-IM.

$$Y = C + I + G + EX - IM, \quad (1)$$

Let us assume now that there is another economy that is the same in every respect as the previous one except that this second one also receives a systematic flow of tourists because it is necessary that a share of the production in our "mixed economy" be directed to tourism consumption. We indicate tourism demand in the economy as TU. By introducing a series of simplifying assumptions (the time term is t, in the economy import equals to export, EX - IM = 0, the local population does not travel abroad, and there is no autonomous consumption), the equilibrium condition (1) between aggregate production and aggregate demand becomes

$$Yt = Ct + It + Tut \quad (2)$$

Because we are looking for growth equilibrium in a mixed industrial and tourism economy that does not undergo structural transformations, we must assume that the share of tourism consumption in income remains constant, which is equivalent to adding the following condition:

$$Tut/Yt = q, \text{ with } 0 \leq q < 1 \quad (2.1)$$

The only problem left to solve, therefore, is the dynamic equilibrium of this mixed economy. With condition (2.1) and the indication of the Keynesian consumption function with no autonomous component, the Harrod-Domar model becomes

$$I_t = v\,(Y_{t+1} - Y_t)$$

$$Y_t = C_t + I_t + Tu_t$$

$$C_t = cY_t \tag{2.2}$$

By substituting the third equation (2.2) into the second one, solving for It, establishing the propensity to save (s) a fraction of national income as a source of investment, and inserting the result into the first equation, we obtained

$$sY_t - Tu_t = v(Y_{t+1} - Y_t). \tag{2.3}$$

Dividing both sides by Yt, we find a warranted growth rate γT of the mixed (industrial and tourism) economy:

$$\gamma T = (s - q) / v = (s - q)\,\pi \tag{2.4}$$

where $\pi = 1/v = (Y_{t+1} - Y_t)/(K_{t+1} - K_t)$ denotes marginal capital productivity and where under condition (2), the ratio $q = TU_t / Y_t$ is assumed to be constant, with $s > q$. The comparative dynamics in the specialised economy allow us to remark that $(s-q)\,\pi < s\,\pi$, and therefore $\gamma T < \gamma a$. The effect of tourism on the host economy is that the warranted income growth rate is lowered; over the long term, tourism consumption has a crowding-out effect on investments by domestic firms. In terms of the lower warranted income growth rate (in the Harrod-Domar growth model, we recall that this is the growth rate necessary to maintain the dynamic equilibrium between production and demand), tourism consumption would only not lower the rate if residents reduced their

household consumption to allow for consumption by tourists; in this case, the consumption function would become $C_t = cY_t - T_{ut}$, which, when inserted into (2.1), would drive the economy to warranted growth rate γa.[1]

To complete the theoretical analysis in this paper, the equilibrium or steady state condition that will be tested in the econometric section of this work must be considered. To obtain the equilibrium condition of a full economy, the equality of γT and $n + \lambda$ should be stipulated because in the Harrod–Domar growth model, in order for the initial equilibrium to be steady over time, it is necessary that the growth rates of population n and technological progress λ both follow the so-called natural growth rate γ (or $\gamma = n + \lambda$).

$$\gamma T = (s - q)\ \pi = n + \lambda = \gamma \qquad (2.5)$$

The growth of mixed economy γT is not affected by tourism and remains unchanged because it is plausible to assume that tourism development does not affect demographic and technological parameters.

Now we will introduce Kaldor's model, which focuses on the distribution of total income between profits Π and wages W, and which assumes that two divided groups' propensities to save will differ: profit earners' (capitalists') propensity to save s_c is assumed to be larger than that of wage earners (workers)[2] s_w, given that Keynes stated

[1]In certain pure socialist countries such as Cuba, where the so-called benevolent social planner reduces aggregate consumption using economic policy instruments, smoothing consumption over the lifetime of a typical household can occur at lower standards of living, but this does not occur in capitalist economies, so that the last theoretical consideration is not typical for the modern world.

[2] Keynes never formulated a theory of distribution. The credit for developing the Keynesian theory of distribution goes to Kaldor, who contended that the principle of the multiplier could be used to determine the relationship between prices and wages given the output and employment levels.

that the marginal propensity to consume decreases when income grows and Kalecki considered different propensities to consume depending on whether the source is wages or profits. In other words, the propensity to spend one's share of income is much greater among the working class than *vice versa.* Therefore, total saving is determined by the following equation:

$$S = sc\,\Pi + sw\,W \qquad (3)$$

where $s = S/Y = sc\,\Pi / Y + sw\,W / Y$ with postulated $sc > sw$.

Using Qc and Qw, respectively, to indicate the shares of income accruing to the capitalists and to workers, $Qc + Qw = 1$, and therefore, we can write

$$S = scQc + swQw = scQc + sw(1\text{-}Qc) = (sc\text{-}sw)Qc+sw \qquad (3.1)$$

Inserting (3.1) into (2.5), we obtain the share of profits in a mixed economy that maintains the growth rate in equilibrium:

$$Qc = ((\gamma - \pi\,sw)/(sc - sw)\,\pi) + (q/(sc\text{-}sw)) \qquad (4)$$

The first-order condition (4), with respect to q, shows the equilibrium effect of opening up a destination to international demand on the functional distribution of income. Because in Kaldor's model,

$$\partial Qc / \partial q = 1/(sc-sw) > 0, \quad (5)$$

the destination with a higher share of tourist output in the aggregate economy has a higher quota of profits and a lower quota of wages in the national income. The interpretation here is that tourism-led growth, which stands as a euphemism for the continuing increase in the tourism-to-output ratio, may effectively expand profit shares in the income distribution and reduce thus wage shares in income (implicitly, the proposition $\partial Qw / \partial q = 1/(sw-sc) < 0$) can also be valid). In a predominantly tourist-developed country, tourism labour productivity is typically low, and average real wages often converge toward the minimum wage. Although tourism is labour-intensive, the workforce, which is mainly seasonal, contributes less to the salaries in aggregate income than is the case in predominantly industrial countries. Because lowering the wage share in origin countries' income distributions can stagnate tourism growth, the obvious theoretical conclusion is that the future development of destination economies is halted.

Of course, the highlighted consequences of Kaldor's model, considering the relationship between income distribution and tourism in the macroeconomic framework, are actually counterintuitive if we contemplate matters differently. The growth in real wages as part of the GDP in western, industrialised countries implies higher potential growth in international tourism demand.

All in all, this led to the theoretical possibility that the ratio of tourism to output and its dynamics could influence the redistribution of national income between workers and capitalists and vice versa.

The last expression can be transformed into the elasticity of profit share in the mixed economy regarding tourism's share of the economy if we multiply both sides of (5) by q/Qc.

$$\partial Qc / \partial q * q/Qc = 1/(sc-sw) * q/Qc,$$

The elasticity coefficient is unknown, but the above theoretical considerations suggest that at the macroeconomic level, we should be able to observe a positive (or negative) relationship between the profit (or wage) shares in the national income and tourism shares in the economy.

3.2. Specifications

The standard method of statistically proving facts is to test hypotheses. In our case, we would formulate as the null hypothesis H0 the claim that profit (or wage) share in GDP is not related to the tourism-to-GDP ratio. The related, alternative hypothesis is denoted as H1. To test the hypothesis that tourism share in aggregate demand expands (or reduces) the share of profits (or wages) in output, this paper assumes a simple empirical linear relationship between the two variables. Thus, the econometric model for estimating the factor contribution share in GDP, in regard to tourism over GDP, takes the following form:

$$FACTOR\_CONTRIBUTION\_SHARE = a + b*TOURISM/GDP \quad (6)$$

Taking logarithms and adding time subscripts (*t*) and an error term (*uit*) to equation (6), the equation for estimating factor share becomes

$$Ln\ (FACTOR\_CONTRIBUTION\_SHARE_{it}) = \alpha_0+\beta_1 ln\ (TOURISM/GDP_{it}) + u_{it} \quad (7)$$

where FACTOR_CONTRIBUTION_SHARE is the percentage of profits (or, alternatively, wages) in the aggregate income, TOURISM/GDP is the tourism-to-GDP ratio, i = 1… 35 (total number of countries, i.e., 15 for the Mediterranean circle and 20 for the Northern circle), and t = 1,…15 (1 = 1995 and 15 = 2009).

Thus, a unique type of model is developed to estimate the links between factor shares in GDP and tourism in GDP across the various nations, namely, a panel regression model. The total set of countries is divided into three groups: Total set, Mediterranean circle and Northern circle.

The above model is a generalisation of the different types of specifications to be used in the empirical analysis based on different techniques for estimating static panel data econometrics. We use the panel data method because: (i) both time series and cross-sectional data are available, and (ii) only the relationship between the tourism over GDP and the factor share in GDP is of interest, not forecasts. The restrictions imposed by the cross-section methods yield biased results because they do not control for heterogeneous relationships between countries. Time-series analysis *per se* imposes analogous assumptions about the comparability of different observations in time and also yields biased results (separately, the observed period in our cases is too short). Only panel data methods explicitly take into account unobserved heterogeneity.

The signs for the estimators associated with the variables in the model are expected to be similar to the aforementioned theoretical expectations. It is expected that the effect of the tourism-to-output ratio (TOURISM/GDPit*i*) on profit share is positive and on wage share, it is negative. That is, the tourism-to-output ratio, as a proxy for tourism dominance in an economy, has relevant impact, with a theoretically elaborated direction of the aggregate income factor share.

4. The Data

The model for factor share that links tourism demand to GDP developed as Equation (7) was examined empirically for the case of A) sample and two subset of sample (B and C). A) The total data set (using data on 33 countries) comprises the following countries: AUT, BEL, BGR, HRV,CYP, CZE, DNK, EGY, FIN, FRA, GER, GRC, HUN, ISL, IRL, ISR, ITA, LUX, MLT, MAR, NLD, NOR, POL, PRT, ROM, SVN, SVK, ESP, SWE, CHE, TUN, TUR, and GBR; (B) The Mediterranean countries (14) are: HRV, CYP, EGY, FRA, GRC, ISR, ITA, MLT, MAR, PRT, SVN, ESP, TUN, and TUR; and (C) the Northern block (19 countries) consists of AUT, BEL, BGR, CZE, DNK, FIN, GER, HUN, ISL, IRL, LUX, NLD, NOR, POL, ROM, SVK, SWE, CHE, and GBR. The names of the countries are given in shorthand. Nearly all countries are European; the exceptions are Egypt, Israel, Morocco and Tunisia.

GDP factor shares in percentage statistics over the sample period were collected from the Extended Penn World Tables (EPWT) 4.0 (xls) database on Foley's website. The countries were chosen based on the intuited importance of tourism to their aggregate outputs and on the availability of the required data. The Mediterranean circle serves as

the benchmark set of countries, and the other two sets are included for comparison. The data used to create the tourism over GDP by countries, as an independent variable, were collected annually from the World Development Indicators found at http://data.worldbank.org/country. All observations are annual and were processed following the required procedures.

5. Panel Data Regression

There are multiple types of panel analytic models: pooled ordinary least squares (POLS), fixed-effects models (FEM), and random-effects models (REM). To select the correct estimator for the model, a number of tests were performed to determine whether classical OLS assumptions would hold for the model, and remedies are suggested. Then, the factor share model was estimated using appropriate method(s).

6. Test of the Model

Because the variability in the data increases when the horizontal section dimension is included in the analysis, it is accepted that the panel unit root tests with regard to the information about both the time and the horizontal section dimensions of the data are statistically stronger than the time series unit root tests, which consider only the time dimension (Im, Pesaran, Shin, 2003; Maddala, Wu, 1999; Taylor, Sarno, 1998; Levin, Li, Chu, 2002; Hadri, 2000; Pesaran, 2006; Beyaert and Camacho, 2008).

Although nearly all classical panel data econometrics assume cross-section independence, the dependent variable(s) was subjected to the panel unit root tests to detect whether there would be possible cointegration with other variables. When the

significance level obtained from the test results is smaller than 0.05, the null hypothesis is rejected, and it is determined that the series is stable. However, because both tests rejected the unit root hypothesis, the analysis proceeded with estimating the models in log levels (Table 1).

Table 1. Results of panel unit root testing for dependent variable (all countries)

PANEL UNIT ROOT TESTING	ADF TEST	HADRI TEST
log(PROFIT_SHARE)	-5.094***	14.852 ***
log(WAGE_SHARE)	-5.179***	14.843***

Note: Signif. codes: 0 '***'

Source: Author's calculations; notes: reject the null of unit root at the level of significance *** 0%

The following sections discuss the results of each econometric model.

Before panel data estimations are performed, it is necessary to choose the appropriate estimation techniques for the model and test for the specification characteristics. The likelihood ratio test for individual effects and the Hausman test are performed to determine whether to treat individual effects as country-specific or period-specific, and for each effect, the choice is made between fixed and random effects. Tests for heteroscedasticity and autocorrelation assist in specifying and estimating. The following tests are first conducted to aid in choosing the estimation techniques.

Using panel data allows one not only to investigate dynamic relationships but also to control for unobserved cross-section heterogeneity. With panel data, the issue is whether to use random-effects or fixed-effects estimation. The random-effects approach to

estimating β_i exploits the correlation in the composite error composed of the unobserved heterogeneity and the error term. This approach uses the idiosyncratic error term, assuming that unobserved heterogeneity (or a specific country effect) is orthogonal to particular country input variables in time dynamics, and it uses a generalised least squares (GLS) estimator to take into account serial correlation in the composite error.

There can, however, be many instances in which this assumption is violated. Specifically, unobserved heterogeneity (individual country effects) can be correlated with explanatory variables in the present model if the individual country effects influence the input variable. In this case, a fixed-effects estimator which is more robust may be more appropriate to use. A shortcoming of the fixed-effects approach, however, is that time-constant factors cannot be included as explanatory variables; otherwise, there would be no way to distinguish the effects of these variables from the effects of the unobservable variable. Although in our panel data set, the tourism-to-GDP ratio is not particularly volatile, that variable is also not exactly constant. Another shortcoming of the fixed-effects estimator is that it is less efficient than the random-effects estimator; it has a lower degree of freedom and calculates only the within-units variation, not the variation between units. Accordingly, to avoid exclude intuitively hypothesised issues, the unique explanatory variable that determines the factor share in aggregate output, it is natural to exclude from the game the fixed-effects estimator. However, prior to opting for the random-effects estimator, we need to diagnostically test this question. Whether the effects are truly random or not can be determined by F test. Validation was performed once again using LM and the Hausman test.

7. Fixed Effects versus the Pooled OLS Estimator

In the estimation, unbalanced panel data were used, and individual effects were included in the regressions. We first perform the test for data pooling (Chow F- test) by comparing the fixed effects and the benchmark pooled OLS fits by means of F test for individual effects. Our results indicate that there is substantial inter-country variation, indicating that a fixed-effects model is appropriate; the FE model is a better choice than pooled OLS (Table 2).

Table 2. FE vs. pooled OLS Estimator: Diagnostic Results of F test (Chow Test)

DEPENDENT VARIABLE (MODEL)	ALL COUNTRIES	MEDITERRANEAN	NORTH
Log (profit_share)	F = 116.467*	F = 91.342*	F = 95.985*
Log (wage_share)	F = 109.117*	F = 108.707*	F = 68.394*

*Null hypothesis rejected

Note: Null (unconstrained) hypothesis – distinct regressions for each individual; alternative (constrained) – individuals have same coefficients, no error components (simple error); Signif. codes: '*' 0.05

Source: Author's calculations

We also used the Lagrange Multiplier (LM) test proposed by Honda (1985) to determine whether the variance of the intercept components of the composite error term would be zero.

The results of the LM tests are summarised in Table 3.

Table 3. Pooled OLS Estimator: Diagnostic Results

	LAGRANGE MULTIPLIER TEST - (BREUSCH-PAGAN)		
DEPENDENT VARIABLE (MODEL)	ALL COUNTRIES	MEDITERRANEAN	NORTH
Log (profit_share)	$\chi^2(1) = 3422.56$*	χ^2 (1) = 1658.433*	χ^2 (1) = 1812.04*
Log (wage_share)	χ^2 (1) = 3625.50*	χ^2 (1) = 1677.30*	χ^2 (1) =1711.440*

Null hypothesis rejected; Signif. codes: '' 0.05

Source: Author's calculations

Here, with the LM test, we successfully reject the null and conclude that random effects are appropriate; the test also suggests that some form of parameter heterogeneity must be taken into account. This is, evidence of significant differences across countries, and therefore, we cannot run a simple pooled OLS regression. Now, the confirmation comes from comparing the pooled OLS estimator with the RE estimator.

a. Fixed Effects versus Random Effects – The Hausman Test

Random-effects methods are more efficient that the fixed-effects estimator under more restrictive assumptions, namely, the exogeneity of the individual effects. A central assumption in random-effects estimation is that the random effects are uncorrelated with the explanatory variables. One common method for testing this assumption is to employ the Hausman (1978) test to compare the fixed- and random-effects estimates of coefficients. The Hausman test indicates whether the specific effects are correlated with

the explanatory variables. Thus, we test for the occurrence of endogeneity, or, in other words, whether it is really more appropriate to choose the competitive random-effects model, based on the exclusion principle, rather than a fixed-effects model.

High Hausman Chi-square values (that is, low *p*-values, for example<0.05) favour fixed-effects modelling, and low Hausman Chi-square values (that is, high *p*-values) favour random-effects modelling.

The results of the Hausman specification tests are summarised in Table 4 below.

Table 4. FE vs. RE Estimator: Diagnostic Results

	HAUSMAN SPECIFICATION TEST (ENDOGENEITY)		
DEPENDENT VARIABLE (MODEL)	ALL COUNTRIES	MEDITERRANEAN	NORTH
Log (profit_share)	χ^2 (1) = 1.562 (0.211)	χ^2 (1) = 1.842 (0.174)	χ^2 (1) = 3.061 (0.081)
Log (wage_share)	χ^2 (1) = 2.025 (0.154)	χ^2 (1) = 2.907 (0.088)	χ^2 (1) = 3.014 (0.082)

Note: () - p-value

Source: Author's calculations

The results of the Hausman test suggest that the random-effects model (REM) is the appropriate panel data estimator for this study because the Chi-square statistic ($\chi 2$ = 1.56–3.06) provides evidence against the null hypothesis that there is no misspecification. Therefore, the Breusch-Pagan LM test results, which strongly indicate the existence of REs, is supported by the Hausman test results, which also find in favour

of the RE. These findings suggest that the RE estimator can be used in all of our regressions without the anxiety of producing biased estimates.

b. Testing for Heteroscedasticity

In panel data analysis, homoscedasticity is an underlying assumption. Consequently, the assumption of homoscedasticity in the panel sample data needs to be tested. To test the heteroscedasticity in the model, the Breusch-Pagan LM test was adopted because it accurately detects heteroscedasticity. The null hypothesis for the Breusch-Pagan test is homoscedasticity. The test detected the existence of heteroscedasticity in all regressions except for that for the total set of included countries with profit share as a dependent variable. The most popular remedy for heteroscedasticity, the heteroscedasticity corrected standard errors technique, is used to estimate the random effects of the model for the Mediterranean circle. It focuses on improving the estimation of the standard errors in estimators without changing the slope coefficient estimates. For the other models that were plagued by heteroscedasticity, different means were used (see the next paragraph).

c. Test for Serial Correlation

The estimation of the random-effects models uses the Breusch-Godfrey/Wooldridge test for serial correlation in panel models. This test indicated the presence of serial correlation in the residuals in all cases except for the Mediterranean set. To remedy the first-order serial correlation, the general FGLS estimator is used to yield unbiased and efficient parameter estimates. This type of estimator allows for correcting the serial

correlation structure and heteroscedasticity within the panel data when both problems occur at the same time.

d. The Hausman-Taylor estimator

The error term (uit) in our model reflects measurement error both in percentage of factor share and in the other determinants of cross-country differences in factor share that were excluded for this simple specification. To correct for the omitted variable bias, it is assumed that factor distribution share is affected by realised tourism per capita because time and human resources are required to develop and improve structure and income distribution. Although we exclude the endogenous problem using the Hausman test in our model with one explanatory variable, and instrumental variable methods allow for consistent estimation when the explanatory variables (covariates) are correlated with the error terms of a regression relationship, in the table 5 and table 6 we present the results for the Hausman-Taylor (1981) estimator, and the 2SLS regression results are displayed in the table 7. (Appendix)

The 2SLS regression uses at least one instrument and identifying assumptions to obtain an unbiased estimator. The identifying assumptions are that the instrument correlates highly with the *explanatory variable* but does not correlate with the error term. The latter assumption cannot be tested, and thus, any conclusions from the Hausman-Taylor estimators rest on attestable assumptions. Hence, the 2SLS regression results should be viewed with caution.

Some theoretical considerations are linked with that procedure. In brief, the tourism demand in a national economy is measured with the tourism-to-GDP ratio and instrumented with the log of TOURISM per capita.

The concept is that with regard to tourism's impact on an economy, wherever a comparative advantage in tourism exists for the local inhabitants, the human factors will focus their activities on tourism, thereby augmenting the profit share in GDP (as our theory suggests).

8. The empirical results

As we mentioned earlier, the Hausman test suggested that random-effects panel estimation was the appropriate strategy to be adopted. The models of equations (1 and 3) above are estimated using the tourism over GDP variable for all three groups of countries. The estimation uses White's heteroscedasticity - corrected covariance matrix estimator for the Mediterranean circle of countries, which is considered to be a robust method. This measure focused on improving the estimation of the standard errors without changing the slope coefficient estimates. The estimation subsequently uses the general FGLS estimators for the remaining two sets of countries that allow for serial correlation and heteroscedasticity within the data. The R-squares of the models are between 0.28 and 0.51, and the F-statistics are always significant at $p < 0.05$. This implies that including estimated random effects, the models explain 28–51% of the variations in the factor share(s).

In the present models, the intercept term $\alpha 0$ is considered to be country-specific, and the slope coefficients are considered to be the same for all countries. The results refer to a simple double log regression of factor share(s) in income structure on tourism to GDP to determine the (constant) elasticity of factor(s) share with respect to the tourism-to-GDP ratio for each of the three groups. The coefficient of TOURISM over GDP ratio, as expected, is positive (0.016) and significant ($p < 0.05$) for the total data set. This implies that the profit shares in the incomes of given countries increase on average by

1.6% when tourism in the GDP increases by 1%. It is found that the intensity index of tourism activity in an economy (as measured by tourism per capita) positively affects profit share in income. We observe that the coefficient on tourism to GDP for the 2SLS procedure is still significant (at the 5% level) and has a lower magnitude. This result suggests that the possibly omitted variables in the random-effects specification likely biased the coefficient upwards. By looking at the first-stage regression results in Panel B, we observe that the proposed instrument (log (TOURPC)) affects the endogenous variable positively and highly significantly (at the 1% level), with an adjusted R2 of 0.92; thus, the assumption of correlation between the explanatory and instrument variables is satisfied. Thereby, the positive value of the coefficient that precedes the explanatory variable for the total set of countries confirms the initial hypothesis of a positive link between tourism intensity in an economy and profit share.

The test results obtained in the regressions with the other data sets are surprising and counterintuitive, that is, contradictory to the earlier theoretical speculations. For the countries in the Mediterranean circle and the Northern circle, we obtain a negative parameter sign when we regress the explanatory variable on profit share. In addition, this parameter is significant for the Northern circle. The IV regression applied to the circuit of the Northern countries resulting in positive but not significant values for the explanatory variables. We also did not find sound statistical evidence in support of the theory that the growth of tourism in GDP causes a rise in the share of profits in aggregate income.

If we consider the results of the regression of wage share in income as an endogenous variable given the explanatory variable, we see that the results are, as expected, more or less the inverse of a regression with profit share in income as an independent variable. In the focus of our research, as well as in the detailed theoretical elaboration that links profit and tourism, it does not make sense to interpret these regression results separately.

9. Conclusions

The theory that explains tourism intensity (within output) growth by referring to the functional distribution of aggregate income (between wages and profits) - but abstracting from complexity because of the progressing reductionism - cannot be reliably tested at the national level. However, the modified Kaldor theory of income distribution and its interference to tourism sector could, at least in principle, be tested more reliably at the global level. In this paper, we attempt to do this.

The stylised fact (the magnified tourism demand within GDP), coupled with a firmer fact (the impact on the increasing global share of profit in GDP), suggest that the total set of included economies in our empirical research closely followed the theoretical speculation of profit-led growth in economies. Profit-led growth can provide sufficient savings and investment for future generations, and wage-led growth is beneficial (but myopic) for mitigating the effects of short-term recessions (for example Croatia, Greece, Portugal, Italy, Egypt, etc.).

However, we failed to find hard evidence that our theory was valid in the separate cases of the Mediterranean and Northern circle countries. One of the reasons the Mediterranean economies have been losing momentum in growth, compared with the finite set of all included countries to produce substantial profits through tourism growth, may be linked to the exaggerated union interest in valuing labour in those countries. Because the tourism sector is labour-intensive by nature, continuing steps to increase minimum wages could stimulate the expanding wage share in GDP if and only if other factors beyond the horizon of our reasoning remain the same.

Although we know that a conservative stance in wage policy has not been popular, the proven rule, one that was once obeyed in economic policy making, that wages must

move hand-in-hand with labour productivity needs to be resurrected, allowing the Mediterranean tourist economy to continue to generate growth and capacity for future generations.

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APPENDIX

Table 5. Random Effects of Models: Estimation Results of Profit Share Model

DEPENDENT VARIABLE PROFIT_SHARE	ALL COUNTRIES	MEDITERRANEAN	NORTH
Constant	-0.643*** (-15.97) -0.691*** (-7.764)	-0.541 *** (-7.521) [-7.150]+	-0.688 *** (-15.574) -0.034*** (12.987)
Log (TOUR/GDP)	0.007 (0.863) 0.016* (2.023)	-0.004 (-0.291) [-0.224]+	0.008 (0.789) -0.027** (-2.873)
Observations	495 (33 countries* 15 years)	210 (14 countries*15 years)	285 (19 Countries* 15 years)
R-squared	0.28	0.4	0.36
F	3.227 [0.03]	6.768 [0.01]	6.675 [0.01]
Breusch_Godfrey/Wooldridge Test of serial correlation	100.468 [0.000]	12.556 [0.051]	72.581 [0.000]
Breusch-Pagan LM test of heteroskedasticity a)	1.092 [0.295]	17.930 [0.000]	6.744 [0.009]

Source: Author's calculations

Notes: The t-values are shown in () brackets; t-values obtained from the standard errors of the β_i's which are White-adjusted are in [ ]+; p-values in [ ] brackets; bolded are general FGLS estimators that allows for a serial correlation structure and heteroscedasticity within panel data.a) Based on the OLS estimates, tested for heteroscedasticity. The null hypothesis for the Breusch-Pagan test is homoscedasticity.

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 '

Table 6. Random Effects of Models: Estimation Results of Wage Share Model

DEPENDENT VARIABLE: WAGE_SHARE	ALL COUNTRIES	MEDITERRANEAN	NORTH
Constant	-0.541 *** (-7.521) -0.746*** (-17.147)	-0.914 *** (-8.901) [-7.184]+	-0.717 *** (-13.06) -0.846*** (-20.945)
Log (TOUR/GDP)	-0.009 (-0.767) -0.002 (-0.295)	0.006 (0.296) [0.194]+	-0.009 (-0.715) 0.041*** (4.332)
Observations	495 (33 countries*15 years)	210 (14 countries*15 years)	285 (19 countries*15 years)

R-squared	0.46	0.51	0.39
F	12.108 [0.000]	6.987 [0.01]	11.399 [0.000]
Breusch_Godfrey/Wooldridge Test of serial correlation	55.057 [0.000]	12.222 [0.06]	31.927 [0.000]
Breusch-Pagan LM test of heteroskedasticity a)	7.137 [0.007]	26.318 [0.000]	1.986 [0.04]

Source: Author's calculations

Notes: Ibidem

Table 7. 2SLS Model by Hausman and Taylor Estimator: Estimation Results

Dependent Variable	PROFIT_SHARE			WAGE_SHARE		
	All countries	Mediterran.	North	All countries	Mediterran.	North
Panel A. Second-stage regressions						
Constant	- 0.643*** (-15.97)	-0.541*** (-7.521)	-0.688*** (-15.574)	-0.779*** (-14.378)	-0.909*** (-7.840)	-0.654*** (-11.269)
Log TOURGDP	0.007 (0.863)	-0.004 (-0.291)	0.008 (0.789)	-0.009 (-0.767)	0.007 (0.204)	-0.012 (-0.715)
Observations	495	210	285	495	210	285
R-squared	0.25	0.37	0.32	0.24	0.32	0.29

Instrumented variable	TOURGDP	TOURGDP	TOURGDP	TOURGDP	TOURGDP	TOURGDP
Instrument	TOURPC	TOURPC	TOURPC	TOURPC	TOURPC	TOURPC
Panel B. Second-stage regressions						
Log(TOURPC)	0.715*** (71.955)	0.737*** (52.875)	0.708*** (52.417)	0.715*** (71.955)	0.737*** (52.875)	0.708*** (52.417)
Observations	495	210	285	495	210	285
R-squared	0.92	0.92	0.91	0.90	0.89	0.87

Source: Author’s calculations

Notes:The t-values are shown in () brackets

Signif. codes: 0 ‘***’