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THE EPISTEMOLOGICAL VALUES OF TRAVEL & TOURISM COMPETITIVENESS INDEX AND ITS PREDICTIVE POWERS ON TOURIST ARRIVALS IN AFRICA; PLS-SEM APPROACH

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Abstract: This study aimed to assess the explanatory power of the sub-indices and pillars of the Travel & Tourism Competitiveness Index on ITA taking Africa as a case. The study extended the epistemological articulations and empirical values of the TTCI by introducing ITA as a dependent variable. It took WEF's 7 years report on TTCI of 29 African economies. Results show that the predictive powers of half of TTCI Sub-indices as formative indicators to ITA are weak and negative. Analogously, the collinearity, validity, and reliability issues of sub-indices were substantially not resolved. These findings have implied that the TTCI has to articulate its predictive bearing before it can be accepted as an epistemologically and practically relevant concept that prescribes policy issues especially on the course of diagnosing the African Tourism ecosystem.

Key words: destination competitiveness, TTCI, African Tourism, epistemology of competitiveness of competitiveness, PLS-SEM Approach

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INTRODUCTION

1. Study Background

The discourse of inquiry on tourist destinations competitiveness is a recent academic phenomenon (Mazanec and Ring, 2011; Mazanec et al., 2007; Pike, 2008; Weldearegay, 2017). However, it has suddenly overwhelmed the travel and tourism discipline of inquiry from the ending of the second millennia onwards and, currently, it is one of the hottest agendas of academic debates in the tourism field (Weldearegay, 2017). Destination competitiveness research has, now, well matured to a level of moving on from defining the concept, gathering important data on it, aggregating, disaggregating, and indexing towards the development of measurement instruments and elements of theory building discourses (Mazanec et al., 2007). Mapping all works of literature on destination competitiveness give two main streams of indicators; one, destination competitiveness measured from output or impact point of view (OECD's Approach); and, two, destination competitiveness measured from the input point of view (WEF's Approach).

From an input point of view, the most comprehensive and systematic collection of data on destination competitiveness is the Travel and Tourism Competitiveness Index (TTCI) (Ring, 2016) that has collected comprehensive data for more than seven years. The TTCI, which gives the basis to the Travel and Tourism Competitiveness Report (TTCR), was started in 2007 by WEF with three sub-indexes, 13 pillars, 58 individual indicators, and 124 economies which developed into four sub-indexes, 14 pillars, 90 individual indicators and 140 economies in 2019.

However, the TTCI receives strong criticisms from its different aspects. The aspects of the criticism are the following. On, the TTCI is based neither on well-built theory nor does itself constitute a theory. It has not discussed the philosophical and ideological underpinnings of its claims. As such, it is nothing more than a comprehensive definition of destination competitiveness (Mazanec and Ring, 2011; Mazanec et al., 2007). The second criticism of the TTCI is its arbitrary weighing of variables (Mazanec and Ring, 2011; Pulido-Fernández and Rodríguez-Díaz, 2016). Moreover, the variables in the TTCI index are measured based on hard data and executive's opinion poll (Pulido-Fernández and Rodríguez-Díaz, 2016). The last, but the most important, criticism is that, from an epistemological point of view, the destination competitiveness index appears to be systems of one side rather than cause-effect relationships (Mazanec et al., 2007). This is, therefore, where the

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current study builds. In so doing, the TTCI is made to be the subject of this study, because, with all its criticisms, it still can be regarded as the most comprehensive and systematic collection of data on destination competitiveness (Ring, 2016). This discourse has, henceforth, tried to measure the predictive power of the sub-indices of TTCI on international tourist arrivals taking the case of Africa, and showed the level of the epistemological and practical relevance of the index.

2. Study Objective

The general objective of this study is to examine the epistemological Values of the Travel & Tourism Competitiveness Index (TTCI) and its Predictive Powers on the continent's "International Tourist Arrivals" and whether such results can be used as inputs towards African Tourism Ecosystem Diagnosis.

3. Null Hypotheses

H0: The coefficient β of the African Tourism Competitiveness Valuation results on the sub-index "Enabling Environment" as exogenous latent construct on the path relationship with the "International Tourist Arrivals" as an endogenous latent construct is statistically not different from zero, i.e. β= 0.

H0: The African Tourism Competitiveness Valuation results on the sub-index "Natural and Cultural Resources" as exogenous latent construct doesn't significantly explain the variation on the African "International Tourist Arrivals" as an endogenous latent construct, i.e. β= 0.

H0: The coefficient β of the African Tourism Competitiveness Valuation results on the sub-index "Infrastructure" as an exogenous latent construct on the path relationship with as an endogenous latent construct of African "International Tourist Arrivals" is statistically not different from zero, i.e. β= 0.

H0: There is no statistically significant direct path relationship between the African Tourism Competitiveness Valuation results on the sub-index "T&T Policy and Enabling Conditions" as an exogenous latent construct and the African "International Tourist Arrivals" as an endogenous latent construct, i.e. β= 0.

LITERATURE REVIEW

The discourse of inquiry on tourist destinations competitiveness is a recent academic phenomenon (Mazanec and Ring, 2011; Mazanec et al., 2007; Pike, 2008; Weldearegay, 2017). However, it has suddenly overwhelmed the travel and tourism discipline of inquiry from the ending of the second millennia onwards and, currently, it is one of the hottest agendas of academic debates in the field (Weldearegay, 2017). Destination competitiveness research has, now, well matured to a level of moving on from defining the concept, gathering important data on it, aggregating, disaggregating, and indexing to elements of theory building discourses (Mazanec et al., 2007).

Among many researchers in the destination competitiveness area, some have tried to clarify destinations competitiveness (Dwyer et al., 2004; Garau-Taberner, 2007; Hassan, 2000; Ritchie et al., 2001); some tried to develop a model (Crouch and Ritchie, 1999; Dwyer and Kim, 2003; Hassan, 2000; Ritchie and Crouch, 2003); other tried to identify the relevant factors of destinations competitiveness (Dwyer et al., 2004; Weldearegay, 2017); and, still others tried to evaluate an index's explanatory power (Mazanec and Ring, 2011; Weldearegay, 2017).

Referring to specific indicators; Hassan (2000) built on the theory of comparative advantage; Dwyer and Kim (2003) appreciated demand as an essential construct; Craigwell and Worrell (2008), Dwyer et al. (2000) and Song and Witt (2000) emphasized on destination pricing; Weldearegay (2017) built on the breadth of the concept by appreciating urbanization as a significant construct; and, Cárdenas-García et al. (2013) focused on sustainability dimension of it, to mention a few. In all these discourses, however, almost all authors regard their model as continuously evolving (Mazanec and Ring, 2011).

Coming to general streams, mapping all these works of literature on destination competitiveness give two main streams of indicators; one, destination competitiveness measured from output or impact point of view (OECD's Approach on the study of competitiveness); and, two, destination competitiveness measured from the input point of view (WEF's Approach on the study of competitiveness). On one hand, the substantially agreed output indicators of destination competitiveness are market share based on international arrivals in a destination (Crouch, 2010; Mazanec et al., 2007; Weldearegay, 2017), market share based on international tourism receipts in a destination (Crouch, 2010; Li et al., 2013; Mazanec et al., 2007; Weldearegay, 2017), and tourism revenue/spending per arrival in a destination (Kim, 2012; Weldearegay, 2017) which together appreciate the values of arrivals, the values of receipts and the proportional spending of incoming tourists indicating the destination's price or value proposition competitiveness (Weldearegay, 2017).

On the other hand, the input indicators of destination competitiveness are not, however, as such distilled based on academic debates. On this input aspect of the area, the first effort was the trial to develop Competitiveness Monitor (CM), which was developed by WTTC, in collaboration with the Christel DeHaan Tourism and Travel Research Institute (TTRI) of the University of Nottingham in 2001. It had 65 tourism competitiveness indicators classified into eight dimensions such as openness in tourism, competitiveness in prices, technology, infrastructure, social development, environment, human resources, and human tourism. This discourse has later joined to the initiative of the World Economic Forum (WEF) on compiling Travel and Tourism Competitiveness Report (TTCR) based on set indices, which was first published in 2007.

The Travel and Tourism Competitiveness Index (TTCI) that gives the basis to the Travel and Tourism Competitiveness Report (TTCR) started with three sub-indexes, 13 pillars, 58 individual indicators, and 124 economies which developed into four sub-indexes, 14 pillars, 90 individual indicators and 140 economies in 2019.

As put in Figure 1, in the 2019 report, the TTCI is conceived as a composite construct resulting from the four sub-indices. They are; Enabling Environment, Travel &Tourism Policy and Enabling Conditions, Infrastructure, and Cultural and Natural Resources (World Economic Forum, 2019). The sub-indices are composed of formative indicators too.

Accordingly; the Enabling Environment sub-index consists of five pillars (Business Environment, Safety & Security, Health & Hygiene, Human Resources & Labor Market, and, ICT Readiness); the T&T Policy and Enabling Conditions sub-index consists of four pillars (Prioritization of Travel &Tourism, International Openness, Price Competitiveness, and Environmental Sustainability); the Infrastructure sub-index consists of three pillars (Air Transport Infrastructure, Ground & Port Infrastructure, and Tourist Service Infrastructure); and, the Cultural and Natural Resources sub-index consists of two pillars (Natural Resources and Cultural Resources & Business Travel). Therefore, as stated elsewhere in this paper, mapping all these works of literature on destination competitiveness gives two main streams of indicators; they are output and input indicators. The input indicators of destination competitiveness that have the most comprehensive data (Ring, 2016) for more than 8 years are the ones embodied in the above briefly described Travel and Tourism Competitiveness Index (TTCI) developed by the WEF starting from 2007. However, the TTCI receives strong criticisms from its different aspects.

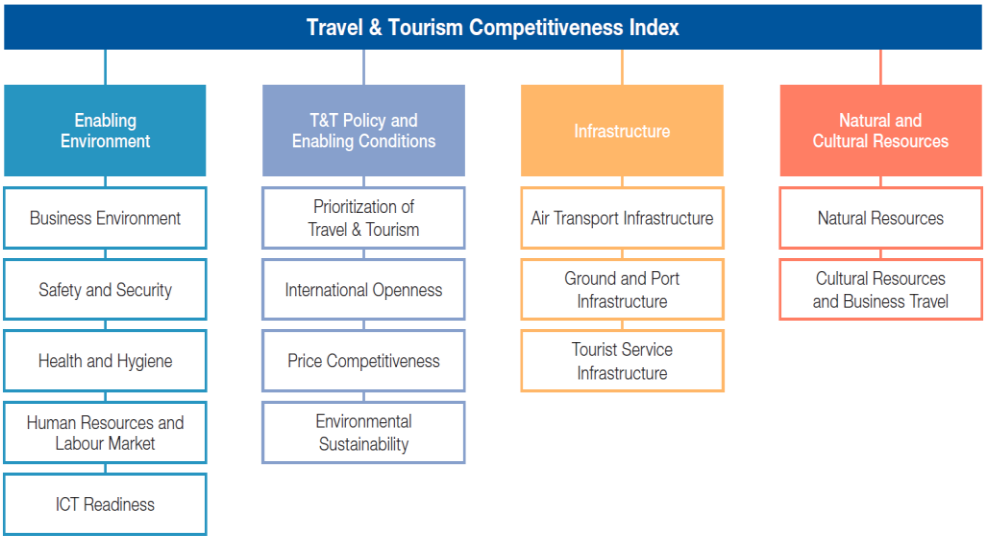

Figure 1. The TTCI Sub-Indices and Pillars (Source: World Economic Forum, 2019)

One aspect of the criticism is that the TTCI is based neither on a well-built theory nor does itself constitute a theory. It has not discussed the philosophical and ideological underpinnings of its claims. As such, it is nothing more than a comprehensive definition of destination competitiveness (Mazanec and Ring, 2011; Mazanec et al., 2007).

The second criticism of the TTCI is its arbitrary weighing of variables (Pulido-Fernández and Rodríguez-Díaz, 2016). The TTCI report treats all items at each step of aggregation – from 90 individual indicators to 14 pillars, and to 4 sub-indices, all calculated as unweighted average (Mazanec and Ring, 2011). However, not all individual indicators, individual pillars, or individual sub-indices would have the same explaining power.

The third criticism is the fact that the variables in the TTCI index are measured based on hard data and executive's opinion poll. In this case, it is argued that not all executives have first-hand experience with the issues and the "go-and-ask-the-practitioners" research strategy cannot be fulfilled. Related critics of these approaches consider that the opinions are too subjective (Pulido-Fernández and Rodríguez-Díaz, 2016). The last and the most important criticism is that it is not known if the two main streams of indicators which are the destination competitiveness measured from an output point of view, and destination competitiveness measured from an input point of view are in a significant statistical harmony to each other. In other words, the explaining power of the input indicators on the output indicators is not statistically estimated to be significant. From an epistemological point of view, the destination competitiveness index appears to be systems of one side rather than cause-effect relationships (Mazanec et al., 2007). This is, therefore, where the current study builds. In creating a proper link between the input factors with success criteria, the output side of destination competitiveness is proposed by many authors to be measured using different indicators including; the number of visitors (Mazanec et al., 2007; Weldearegay, 2017); tourism expenditures (Crouch, 2010; Li et al., 2013; Mazanec et al., 2007; Weldearegay, 2017); tourism receipt per arrival (Kim, 2012; Mazanec et al., 2007; Weldearegay, 2017); seasonality resilience on tourism (Butler, 2001); efficient use and preservation of natural and cultural resources (Ritchie et al., 2001); visitor satisfaction (Kozak, 2002); tourism growth (Mazanec et al., 2007). However, the measure of "International Tourist Arrivals" was used in this study as output indicators because the most readily available data is on this variable.

MATERIALS AND METHODS

1. Research paradigm, positionality, and place of the researcher

Axiologically, the research tried findings not to be mediated by values. The research appreciates that the researcher's biography may directly or indirectly influence the design, execution, and interpretation of the research which makes it very 'difficult' to fully attain a completely 'objective' reality. Ontologically, however, it appreciates that the difficulty to fully attain a completely 'objective' reality doesn't mean that, there is no objective external reality that is independent of human value systems. Epistemologically siding to positivistic world view, but reflexively acknowledging the influence of biography, the research has aspired to achieve 'empathetic neutrality and strived towards dualism of the researcher and the researched.

2. Data Source

The type of data used for this study is secondary data. World Economic Forum's Travel and Tourism Competitiveness Reports of the years 2008, 2009, 2011, 2013, 2015, 2017, and 2019 were used for the exogenous latent construct and the endogenous latent construct, data from the World Bank and the United Nations World Tourism Organization have been used (World Economic Forum, 2008, 2009, 2011, 2013, 2015, 2017, 2019).

3. Sampling and inclusion criteria

The African continent was taken as a single destination. This helps to smoothen the idea of distance bonus or burden from tourist generating countries; to estimate the sustainability of success criteria by avoiding disturbances by short-term phenomena, such as exchange rate fluctuations, terrorist attacks, mega-events, and catastrophes of all sorts that occur in a single country; to neutralize the effect of the size of nations or arrival per capita; and, to smoothen maintaining a sizeable market share versus fast growth of their share. Therefore, taking Africa as a single destination, 29 countries from Africa were taken as a sample. The inclusion criteria used was covering all the countries as long as a country has data of TTCI indices of the years 2008, 2009, 2011, 2013, 2015, 2017, and 2019. Technically, the sampling method can be regarded as a census. Table 1 lists the African economies included in the sample.

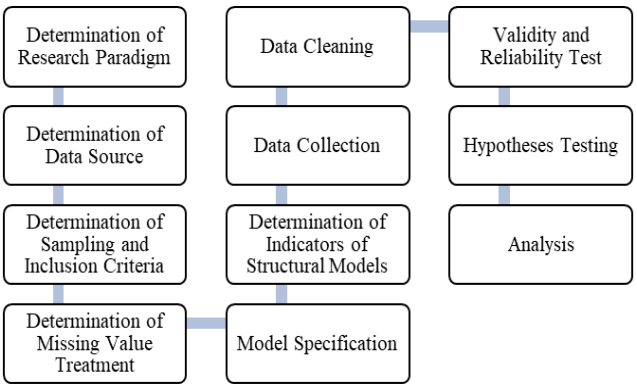

Figure 2. Flowchart of Research Methodology
Source: adopted from Craiut, et al. (2022), Prada et al. (2020), Teklebrhan, et al. (2023), and Arifin et al. (2023)

Table 1. Economies Participated in the Study

S.N.	Economy	S.N.	Economy	S.N.	Economy
1.	Algeria	10.	Ethiopia	20.	Mozambique
2.	Benin	11.	Gambia	21.	Namibia
3.	Botswana	12.	Kenya	22.	Nigeria
4.	Burkina Faso	13.	Lesotho	23.	Senegal
5.	Burundi	14.	Libya	24.	South Africa
6.	Cameroon	15.	Madagascar	25.	Tanzania
7.	Chad	16.	Mali	26.	Tunisia
8.	Cyprus	17.	Mauritania	27.	Uganda
9.	Egypt	18.	Mauritius	28.	Zambia
		19.	Morocco	29.	Zimbabwe

4. Missing value treatment method

Casewise Deletion Method which deletes each row (i.e., case, response, observation) that contains a missing value was used as the missing value treatment method. This method has the disadvantage of changing the sample size and the power of the estimation. However, it is very accurate with a consistent sample size for each analysis across parameter estimations. Hence, sample size 29 is the reduced size after the missing value was treated.

5. Model specification

Partial Least Square (PLS) path modeling of the SEM was used because it is regarded as suitable when; sample size is small, applications have a little available theory, the correct model specification cannot be ensured, and when there is a non-normal distributional assumption of the data (Bacon, 1999; Hwang et al., 2010; Wong, 2010). This study used both the formative and the reflective measurement models. The reflective outer model is specified as: $X_\chi = \Lambda_\chi \xi + \varepsilon_\chi$

Where; X is exogenous Latent Construct or the four sub-indices of the TTCI, Λ (capital lambda) denotes the loading coefficients, and ξ (small letter xi) is the vector of latent Constructs or the 14 pillars of the TTCI, and ε (epsilon) is the residual. Customizing the recommendations of Bacon (1999), Hwang (2010) and Wong (2010), the formative inner model is specified as follow: $\eta = B\xi + \zeta$ Where; η (small letter eta) is the endogenous latent Construct "International Tourist Arrivals", B denotes the matrix of coefficients, ξ (small letter xi) is the vector of exogenous latent constructs which are the four sub-indices of the TTCI, and ζ (small letter zeta) represents the structural model residuals.

Table 2. Indicators of the Outer Model, the Measure model, and the Structural Model (Source: Adopted from World Economic Forum, 2019)

S.N.	Exogenous Variables of the Outer Model	Endogenous Constructs of the Measure Model	Endogenous Variables of the Structural Model or Inner Model
1)	Business Environment (EE1)	Enabling Environment	International Tourist Arrivals
2)	Safety & Security (EE2)		
3)	Health & Hygiene (EE3)		
4)	Human Resources & Labor Market (EE4)		
5)	ICT Readiness (EE5)		
6)	Prioritization of Travel &Tourism (PL1)	Travel &Tourism Policy and Enabling Conditions	
7)	International Openness (PL2)		
8)	Price Competitiveness (PL3)		
9)	Environ. Sustainability (PL40		
10)	Air Transport Infrastructure (IN1)	Infrastructure	
11)	Ground & Port Infrastructure (IN2)		
12)	Tourist Service Infrastructure (IN3)		
13)	Natural Resources (NC1)	Cultural and Natural Resources	
14)	Cultural Resources & Business Travel (NC2)		

6. Data Processing Software

After the data was cleaned and arranged using Microsoft Excel, it was processed by a PLS data processing package called SMART PLS (Version3).

7. Indicator of the Endogenous Latent Variable

As stated elsewhere, the output side of destination competitiveness is proposed by many authors to be measured using different indicators including; the number of visitors (Mazanec et al., 2007; Weldearegay, 2017); tourism expenditures (Crouch, 2010; Li et al., 2013; Mazanec et al., 2007; Weldearegay, 2017); tourism receipt per arrival (Kim, 2012; Mazanec et al., 2007; Weldearegay, 2017); seasonality resilience on tourism (Butler,1994); efficient use and preservation of natural and cultural resources (Ritchie et al., 2001); visitor satisfaction (Kozak, 2002); tourism growth (Mazanec et al., 2007).

However, the measure of "International Tourist Arrivals" was used in this study as output indicators because the most readily available data from 2008 to 2019 is on this variable.

RESULTS AND DISCUSSION

1. Structural Inner Model and Hypotheses Testing

The structural inner model was estimated through R2. R 2 explains the percentage of the variance of the endogenous latent variable by the change in the exogenous latent variable in the structural equation model. Figure 3 shows that the coefficient of determination, R2, of the endogenous latent variable is found to be 0.764. This means that the four exogenous latent variables (Infrastructure, T&T Policy, and Enabling Conditions, Enabling Environment, and Natural & Cultural Resources) explain 76.4% of the variation in "International Tourist Arrivals". However, R2 is such a floating measure that its value increases even if an irrelevant predictor is added. Therefore, adjusted R2 is used to penalize such irrelevance. Customizing the recommendations of Bacon (1999), Hwang (2010) and Wong (2010), the Adjusted R2 is calculated using the following formula:

$$R^2 - adjusted = R^2 - \frac{p(1-R^2)}{n-p-1}$$ Where: = Unadjusted R-square; = sample size which is 29, after missing value treatment; = number of predictor variables (latent constructs) which is 4 in this model

Accordingly, customizing the recommendations of Bacon (1999), Hwang (2010) and Wong (2010), the adjusted R2 is calculated in the following manner:

$$R^2 - adjusted = 0.764 - \frac{4(1-0.764)}{29-4-1} = 0.764 - \frac{4(0.236)}{24} \left| = 0.764 - \frac{0.944}{24} \right| = 0.764 - 0.0393333333$$

$$R^2 - adjusted = 0.725$$

This means that the four exogenous latent variables have a 72.5% penalized and adjusted value of explaining the variation in International Tourist Arrivals unconditional to an irrelevant additional predictor.

Hence, the joint predictive power of the four TTCI Sub-indices overall model combined as formative indicators to International Tourist Arrivals is substantial firmly established. Nevertheless, the individual predictive power of the four TTCI Sub-indices as individual formative indicators to International Tourist Arrivals is not as to the essence of the World Economic Forum in its TTCI. The details are explained as follows. Path coefficient matrixes of the inner model Figure 3 suggest that "T&T Policy and Enabling Conditions" and "Enabling Environment" have a positive and direct effect on the endogenous latent variable. The path coefficient from "T&T Policy and Enabling Conditions" to “International Tourist Arrivals” is found to be 1.172 and the path coefficient from “Enabling Environment” to “International Tourist Arrivals” is found to be 1.216. As these results are out of the statistical values of the path coefficient range (-0.2, 0.2), and are positive values, these indicate that they contribute to an increase in “International Tourist Arrivals” thereby to TDC.

However, the correlation values between “T&T Policy and Enabling Conditions” and “International Tourist Arrivals” as well as between “Enabling Environment” and “International Tourist Arrivals” is showing more than 1. This could be because they may have a spurious component that each variable is being caused by some third variable or set of variables in the model. According to Deegan (1978), if there are 2 or more predictors that are correlated, positively or negatively, then the path coefficient values may exceed the bounds (-1,1). Nevertheless, as such path coefficients can legitimately occur in the presence of strong multicollinearity, analysts should not be reticent to report models with this characteristic.

Neither should analysts feel forced to modify models simply because of the presence of multicollinearity. Standardized regression coefficients are not restricted to any range as the standardized coefficient can coincide with the correlation coefficient. The higher the correlation between two independent variables in the model, the more likely it becomes that the standardized coefficient exceeds the statistical value 1. Therefore, the null hypotheses (H0) "The coefficient β of the African Tourism Competitiveness Valuation results on the sub-index "Enabling Environment" as exogenous latent construct on the path relationship with the "International Tourist Arrivals" as an endogenous latent construct is statistically not different from zero, i.e. β= 0" fails to be accepted. Likewise, the null hypotheses (H0) "There is no statistically significant direct path relationship between the African Tourism Competitiveness Valuation results on the sub-index "T&T Policy and Enabling Conditions" as an exogenous latent construct and the African "International Tourist Arrivals" as an endogenous latent construct, i.e. β= 0" fails to be accepted.

Other results from the path coefficient matrixes of the inner model in Figure 3 suggest that “Natural and Cultural Resources” and “International Tourist Arrivals” have negative effects on the endogenous latent variable “International Tourist Arrivals”. The path coefficient from “Natural and Cultural Resources” to “International Tourist Arrivals” is found to be -0.612 and the path coefficient from “Infrastructure” to “International Tourist Arrivals” is found to be -0.369. As these results are out of the statistical values of the range (-0.2 - 0.2), and are negative values, these indicate that they contribute to a decrease in "International Tourist Arrivals" thereby to TDC which are at odds with the essence TTCI of the World

Economic Forum on the same sub-indices. The finding on the negative relationship of "Natural and Cultural Resources" and "International Tourist Arrivals" is at odds not only with the essence and articulations of the TTCI, but also with the articulations of Weldearegay (2017), and Hassan (2000) that consider it to be one of the core drivers of tourist arrivals.

Therefore, the null hypotheses (H0) "The African Tourism Competitiveness Valuation results on the sub-index "Natural and Cultural Resources" as exogenous latent construct doesn't significantly explain the variation on the African "International Tourist Arrivals" as an endogenous latent construct, i.e. β= 0" fails to be accepted with the finding of negative relationships. Likewise, the null hypotheses (H0) "The coefficient β of the African Tourism Competitiveness Valuation results on the sub-index "Infrastructure" as an exogenous latent construct on the path relationship with as an endogenous latent construct of African "International Tourist Arrivals" is statistically not different from zero, i.e. β= 0" fails to be accepted with the finding of negative relationships. Another worth analyzing results from Figure 3 is explaining powers of the 14 pillars of the TTIC as reflective indicators of the 4 sub-indices.

Accordingly, 12 of the 14 reflective pillars have established strong explaining powers on all of the four sub-indices of the TTCI. However, the explaining powers of the reflective pillar "Prioritization of Travel &Tourism (PL1)" to the sub-index "T&T Policy and Enabling Conditions" and the reflective pillar "Human Resources & Labor Market (EE4)" to the sub-index "Enabling Environment" were found to be weak and negative (-0.027, and, 0.033 coefficient values, respectively). These results are at odds with the perspectives of TTCI of the World Economic Forum that they should be strong and positive. All in all, half of the four sub-indices of the TTCI ("Natural and Cultural Resources" and "Infrastructure") as formative indicators of International Tourist Arrivals and two of the 14 pillars (Prioritization of Travel &Tourism (PL1), and Human Resources & Labor Market (EE4)") as reflective indicators of "T&T Policy and Enabling Conditions", and "Enabling Environment", respectively, are at odds with the perspectives of TTCI of the World Economic Forum that they should be strong and positive. The negative signs in the sub-index "Natural and Cultural Resources" and the pillar "Human Resources & Labor Market (EE4)" are a repetitive phenomenon in that it was found the same in the study of (Mazanec and Ring, 2011) under different samples and different methodologies.

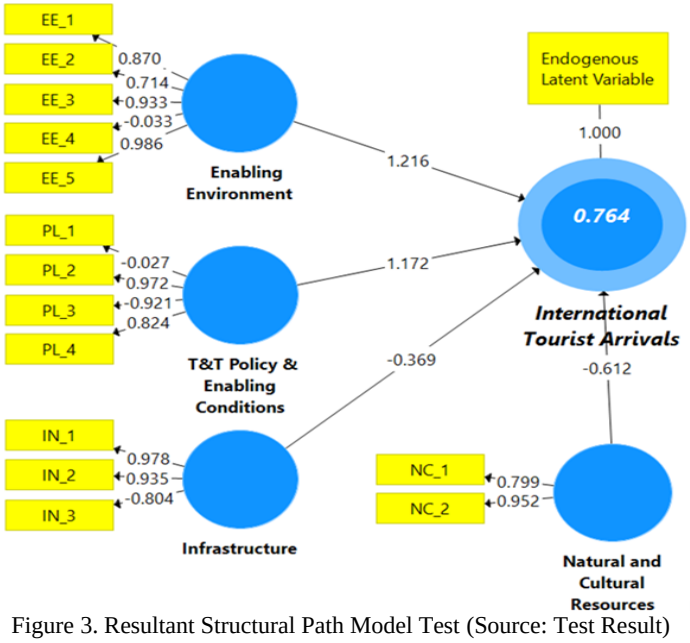

Figure 3. Resultant Structural Path Model Test (Source: Test Result)

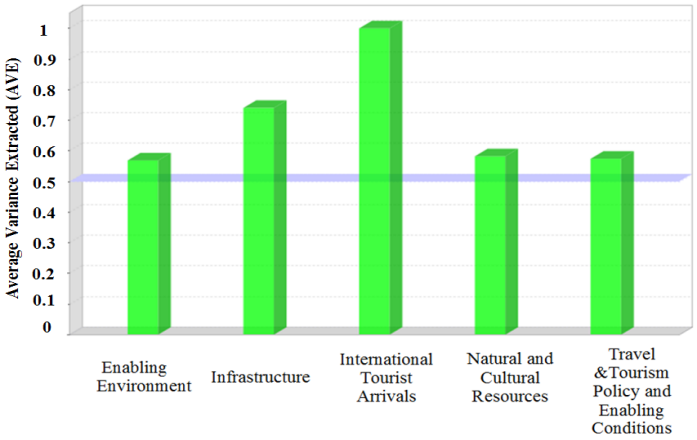

Figure 4. Average Variance Extracted (AVE) for Convergence Validity

Table 3. Inner Variance Inflation Factor (VIF) Values (Source: Test Result)

	Variance Inflation Factor (VIF)
EE_1	26.930
EE_2	7.694
EE_3	7.130
EE_4	5.927
EE_5	35.643
Endogenous Latent Variable _(Dependent _Variable)	1.000
IN_1	30.408
IN_2	23.732
IN_3	2.699
NC_1	1.500
NC_2	1.500
PL_1	1.100
PL_2	11.245
PL_3	5.096
PL_4	4.369

The results are at odds with the perspectives TTCI of the World Economic Forum on the sub-indices and in line with the critics made by tourism researchers in that the TTCI does not represent a destination's actual tourism performance in terms of generating tourist arrivals. So, the epistemological and practical characteristics of the indices, the pillars, and individual indicators of the TTCI are questionable because of their weak and negative predictive powers, and as such, the TTCI's claim of offering guidelines for developing competitiveness-enhancing strategies may posit practical, methodological and theorizing questions.

Statistically, this weak and negative predictive power can be attributed to; one, non-linear phenomena related to inaccurateness of valuing destinations based on the TTCI; two, unobserved heterogeneity where some other variables might act as a background variables.; three; the index valuations system may come too close to capture the cause–effect relationships or the approximated 7-point index scales TTCI system may not manifest true interval-scale property; four, the

tourism resources may not be transformed properly into tourism products that attract tourists unless infrastructures are sufficiently developed, and as such, an interaction term or interplay between the indices "Natural and Cultural Resources" and "Infrastructure" can be observed which ultimately lower value of Infrastructure may offset the value of Natural and Cultural Resources; five, the fact that some of the variables in the TTCI index are valued on the basis of executive's opinion poll with "go-and-ask-the-practitioners" strategy which may collect subjective and professionally unsought opinions with little touch to the actual performance; six; among the 90 individual indicators within the pillars of the TTCI's sub-indices, some of them may be weakly theoretically justified and the statistical methods used to demonstrate the individual indicators' usefulness may not be accurate. All or the combination of some of the above problems can be attributed to result in weaker, and the unexpected negative, explaining power of the formative sub-indices "Natural and Cultural Resources" and "Infrastructure" and the two of the 14 pillars (Prioritization of Travel &Tourism (PL1), and Human Resources & Labor Market (EE4)") as reflective indicators of "T&T Policy and Enabling Conditions", and "Enabling Environment", respectively.

2. Inner Variance Inflation Factor (VIF) Values

To check the attributions, the collinearity test and the Inner Variance Inflation Factor (VIF) have been run. To avoid the collinearity problems, the VIF of 5 or lower is accepted (Hair et al., 2011). As can be seen in table 9, the VIF of the value of half of the exogenous latent variables is greater than 5 which indicates that there is a high collinearity problem. Therefore, the essence of attributing international tourist arrivals to the pillars has failed substantially. This high collinearity test result is consistent with the articulations of Deegan (1978) that if there are 3 or more predictors that are correlated, positively or negatively, then the path coefficient values may exceed the bounds (-1,1). This is because, it is found that the correlation values between "T&T Policy and Enabling Conditions" and "International Tourist Arrivals" as well as between "Enabling Environment" and "International Tourist Arrivals" are showing more than 1 (1.172 and 1.216, respectively).

3. Validity and Reliability Tests

3.1. Validity Tests

In this paper, validity tests are conducted to confirm the research design measures what is intended to measure and whether the total variations found reflect true variations. Accordingly, Average Variance Extracted (AVE) for Convergence Validity, Fornell-Lacker Criterion for Discriminant Validity, and Heterotrait-Monotrait Ratio (HTMT) for Discriminant Validity, have been used to estimate the soundness of the measures. Henseler et al. (2009) put that the average variance extracted should be higher than 0.5. From Figure 3, it is found that all of the AVE values are greater than the acceptable threshold of 0.5, so convergent validity is confirmed, and as such the research design measures what is intended to measure and the total variations in the endogenous latent construct reflect true variations. Table 4 shows the results of the discriminant validity test using the Fornell Larcker criterion. All diagonal elements in the table are not greater than the correlation values in their respective column nor are they larger than the correlation values in their respective row.

Accordingly, the Fornell–Larcker criterion of validity is not well captured. Hence, the TTCI constructs are not valid constructs to be sound explainers of ITAs. So, conclusions made regarding structural paths may or may not be correct as the strength of a relationship could be overestimated, underestimated or a relationship may be confirmed when in fact there is no real relationship. So, one cannot be certain which latent constructs are acting as the antecedent to the explained result. This result is consistent with the results of the Inner Variance Inflation Factor (VIF) used to test collinearity to find high collinearity problems where, in that regard, the essence of attributing international tourist arrivals to the pillars has failed substantially.

The heterotrait-monotrait (HTMT) ratio of correlations is a new method for testing discriminant validity in PLS-SEM. Discriminant validity is established between two constructs if the HTMT value is below 0.90. The results in Table 5 indicate that in more than half of the relationship between two constructs the HTMT value is greater than 0.9. This indicates that the latent constructs are not distinguishable. So, it cannot be certain that the results confirming hypothesized structural paths are real, or merely the result of statistical discrepancies. It is consistent with the results of the discriminant validity test using the Fornell Larcker criterion where the Fornell–Larcker criterion of validity was not well captured and so, the TTCI constructs were regarded as not valid constructs to be sound explainers of international tourist arrivals.

Table 4. Discriminant Validity; Fornell-Lacker Criterion (Source: Test Result)

	Enabling Environment	Infrastructure	International Tourist Arrivals	Natural & Cultural Resources	T&T Policy &_ Enabling Conditions
Enabling Environment	0.754				
Infrastructure	-0.963	0.860			
International Tourist Arrivals	0.828	-0.767	1.000		
Natural & Cultural Resources	-0.805	1.005	-0.699	0.763	
T&T Policy &_Enabling Conditions	-1.031	1.062	-0.753	0.994	0.758

Table 5. Heterotrait-Monotrait Ratio (HTMT) for Discriminant Validity (Source: Test Result)

	Enabling Environment	Infrastructure	International Tourist Arrivals	Natural & Cultural Resources	T&T Policy &_ Enabling Conditions
Enabling Environment					
Infrastructure	1.066				
International Tourist Arrivals	0.813	0.769			
Natural & Cultural Resources	0.915	1.000	0.719		
T&T Policy &_Enabling Conditions	1.246	1.190	0.809	1.107	

3.2. Reliability Test

The test of reliability is conducted to check the soundness of measurements. The reliabilities of the constructs are measured through Composite Reliability, Cronbach's Alpha, and rho_A. Table 6 has contains three reliability Tests. The first result is on Composite Reliability. It is used for the internal consistency measure of PLS. A sound measure of composite reliability or internal consistency is a value greater than 0.7 and hence only half of the latent constructs (Enabling Environment and Natural & Cultural Resources with Composite Reliability values of 0.831and 0.735, respectively) satisfy the composite reliability measure. The second reliability result that Table 6 presents is that Cronbach's Alpha. It is a method used to check the reliability of PLS construct scores which is calculated based on the correlations between the variables to be observed. The recommended Cronbach's Alpha value is greater than 0.5. The testing results of this study show only half of the latent constructs (Enabling Environment and Natural & Cultural Resources with Composite Reliability values of 0.774 and 0.732, respectively) satisfy the Cronbach's Alpha reliability measure. Two constructs (infrastructure and T&T Policy &_Enabling Conditions) that do not satisfy Composite Reliability have not again satisfied Cronbach's Alpha result recommendations while the rest two (Enabling Environment and Natural & Cultural Resources) have satisfied both Cronbach's Alpha and Composite Reliability test thresholds. The third reliability test result that Table 6 presents is the rho_A reliability test result. It is a method employed to check the reliability of PLS construct scores, which is regarded better reliability measure than Cronbach's Alpha because it is calculated based on the loadings rather than the correlations between the variables to be observed. The recommended rho_A value is in the range from 0.700 to 1.000 for formative constructs. The testing results of this study show that rho_A values of four of the latent constructs fall between 0.741 to 1.000 satisfying the suggestions of Henseler et al. (2014).

Table 6. Reliability Tests (Source: Test Result)

Construct	Composite Reliability	Cronbach's Alpha	rho_A
ENABLING ENVIRONMENT	0.831	0.774	0.912
INFRASTRUCTURE	0.540	-0.311	0.898
INTERNATIONAL TOURIST ARRIVALS	1.000	1.000	1.000
NATURAL & CULTURAL_RESOURCES	0.735	0.732	0.741
T&T POLICY &_ENABLING CONDITIONS	0.287	-0.571	0.918

CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions

This study built on relating African valuations on the sub-indices of TTCI with international tourist arrivals to Africa in view of increasing the epistemological and empirical values of TTCI of the World Economic Forum. It put efforts to increase the operational usage and theoretical articulations of the TTCI as the subject of the study by introducing a dependent variable to it and measuring the explaining power of the indices. It took WEF's 7 years report on TTCI of 29 African economies. Accordingly, the following results are found; One, the structural inner model estimated through adjusted R2 resulted that the joint predictive power of the four TTCI Sub-indices combined as formative latent variables have a 72.5% adjusted value of explaining the variation in International Tourist Arrivals. Nevertheless, the individual predictive power of the four TTCI Sub-indices as individual formative indicators to International Tourist Arrivals is not as to the essence of the World Economic Forum in its TTCI. Considering the individual predictive power, the two main streams of indicators which are the destination competitiveness measured from an output point of view measured by International Tourist Arrivals, and the destination competitiveness measured from the input point of view as put in the TTCI are partly found to be statistically unharmonious to each other. Specifically, the explaining power of the input indicators in the TTCI, sub-indices "Natural and Cultural Resources" and "Infrastructure" on the output indicators (International Tourist Arrivals) are statistically estimated to be weaker and negative. Two, the collinearity test through Inner Variance Inflation Factor (VIF) has been run and the VIF of values of half of the exogenous latent variables is greater than the acceptable threshold which indicates that there is a high collinearity problem. Therefore, the essence of attributing international tourist arrivals to the individual pillars of the TTCI has failed substantially.Three, the discriminant validity test using the Fornell Larcker criterion and Heterotrait-Monotrait Ratio (HTMT) were not well captured through convergent validity was established. So, the TTCI constructs were regarded as not distinguishable, giving mixed messages, and as such, they are invalid constructs to be sound explainers of international tourist arrivals. So, it cannot be certain that the results shown in the structural paths are real.

Four, the TTCI constructs "Infrastructure", and "T&T Policy &_Enabling Conditions" are found to be not satisfying both Composite and Cronbach's Alpha Reliability tests though the rho_A reliability test was well satisfied. These again give mixed messages. Therefore, the study finding has implied that the TTCI has strong epistemological issues to be resolved before it reaches the level of prescribing on policy or practical issues. The fact that, epistemologically, the destination competitiveness index appears to house indicators of one side features rather than cause-effect relationships (Mazanec et al., 2007), lacks the proper link with success criteria such as tourist arrivals. However, the concept of TTCI is of little epistemological value unless it explains the destination's actual performance in a system of cause-effect relationships. Without these dependent variables, a TTCI's values get fixed in a stage of description.

As such, TTCI cannot transcend towards having epistemological values that have back and forward explanations as well as cause and effect relationships nor will it have healthy policy prescriptions capacity. This is because; both theory building and policy prescriptions shall begin on featuring relationships among cause and effects or at least associations between factors. If TTCI is to be accepted as an epistemologically and practically relevant concept, therefore, it should articulate how it is capable of explaining performance features that directly depend on it such as tourist arrivals, tourism receipts, and/ or receipts per arrival. As such, the TTCI shall transcend from strictly supply-driven to include the demand

dimensions to it in the harbor of bridging its applicability and theorizing gaps. The overall finding of this paper is that the TTCI has not matured enough to be used by tourism policymakers, especially in Africa, to be able to see where interventions would be valued, make wise public spending and how to prioritize their focus to the things that matter to maintain a competitive destination before better theorizing and measurements are appropriated to it.

2. Recommendations

The study provides two sets of recommendations; epistemologically and empirical. Epistemologically, based on the finding that the TTCI has strong cause and effect issues to be resolved before it reaches the level of prescribing on policy or practical issues, making the various individual indicators, pillars, and sub-indices of the TTCI of the World Economic Forum theory-guided and data-driven would strengthen its significance to theoreticians and academicians. The individual predictive power of the four TTCI Sub-indices as individual formative indicators to International Tourist Arrivals or spending should be measured before TTCI reports can be produced. In line with this, collinearity issues of sub-indices, pillars, and individual indicators, their validity issues to be sound explainers of competitiveness, and the reliability of measures should be tested. To do so, introducing a critical change in the future measurement of destination competitiveness index would be to make them in line with output measures of tourist destination competitiveness such as tourist arrivals and spending. This would lead to better theorizing of the TTCI by establishing both the cause and the effect epistemological aspects of it. Empirically, again based on the findings that the valuations of Africa on the TTCI are not consistent with the number of tourists the continent receives, there is a need to revisit its real-time competitiveness. Therefore, while taking the valuations of TTCI as a springboard is quintessential, grossly taking the prescriptions would be misleading. So, there is a need to revisit the continental tourism eco-system with a new start and be subjected to eco-system diagnosis that intends long-term structural fix. Because African tourism eco-system diagnosis is significant to broadly understand the continental peculiarities of the Tourism Sector that are deviating it from the TTCI reports. This is because the gross TTCI reports do not support the African tourism sector's work in tune with its real-time data. Therefore, though basing on the TTCI is quite important, revisiting them against regional tourist flows and at the African tourism eco-system level is prototypical. This can ultimately keep a high degree of sector organization at a continental level based on real-time data of input and output indicators.

Limitations of the Study

The scores of the independent variables on different countries are captured from the World Economic Forum (WEF) (World Economic Forum, 2008, 2009, 2011, 2013, 2015, 2017, 2019), The World Bank (2021), and the UNWTO (United Nations World Tourism Organization, 2009, 2010, 2012, 2014, 2016, 2018, 2021). The scores of the measures are therefore only as good as the implicit assumptions of the WEF, World Bank, and the UNWTO. As the study uses a secondary data source, the quality of the data wholly depends on the previous source of data.

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