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Tourism-income inequality Nexus in Africa: evidence from SADC countries

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ABSTRACT

The tourism sector is one of the fastest-growing services sub-sectors worldwide and promises to unlock job opportunities and improve social inclusion outcomes in developing countries. We focused on the Southern African Development Community (SADC) region, which houses developing countries with high income inequality and constitutes attractive tourist centres in sub-Saharan Africa. We employed both the disaggregated and composite indicators of tourism development to investigate the tourism-income inequality nexus in the SADC region from 2010 to 2019. Utilizing the panel quantile regression approach, our overall results suggest that tourism development is inequality-worsening, and this is robust to both the composite tourism index and the individual tourism indicators (except in a few instances). While we established that net FDI inflows improve the inequality outcomes in the region, less corruption worsens inequality (except in a few cases). Accordingly, we offer relevant policy options for the governments of the SADC region.

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1. Introduction

The tourism sector is gradually gaining prominence as a viable growth-enhancing sector globally, considering its increasing contribution to the World's gross domestic product (about 10%) and international services exports (about 30%). It is adjudged one of the fastest-growing services sub-sectors worldwide (Chi, 2020). According to the United Nations' World Tourism Organisation (UNWTO, 2020), international tourism arrivals surged by 130%, from 1 billion tourists in 1995 to 2.3 billion tourists in 2019, while global tourism receipts more than doubled, rising from US$509.4 billion in 1995 to US $1.8 trillion in 2019. The World Bank (2017) and UNWTO (2020) ranked tourism among the largest export industries in the 20 least developed economies, with half of these countries recording a three-digit growth in the tourism sector since 2009.

Moreover, statistics from the World Travel and Tourism Council (WTTC, 2020) show that the growth rate of the travel and tourism sector (3.5%) outpaced the growth of the global economy (2.5%), with the sector contributing 10.3% to global gross domestic product (GDP) in 2019 and creating 330 million jobs globally. In Africa, however, the tourism and travel sector contributed 7.1% to total GDP, 6.8% to total employment and 10.4% to total exports in 2019. Available evidence on the Southern African Development Community (SADC) shows that the tourism sector's contribution to the region's GDP, employment, and exports in 2019 stood at 7.2%, 6.6% and 9%, respectively (WTTC, 2020). While it is impressive that the tourism sector's contribution to GDP in SADC is slightly

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above the African average, its share in employment and exports underperformed the continental average.

Intuitively, the growth-enhancing effect of tourism development in SADC is low as economic growth in the region is less inclusive. This is evidenced by the region's pervasive poverty, unemployment and income inequality. Specifically, the unemployment rate in a few SADC countries, including Angola, Tanzania and Zimbabwe, stood at 7.7%, 2.2% and 5.7%, respectively, in 2020, while the proportions of the population living below the poverty line in these countries were 51.8%, 49.4% and 33.9%, respectively, in 2017 (WDI, 2020). Similarly, their inequality rates stood at 53.2, 41.3 and 49.6 index points, respectively, in 2019 (Solt, 2019). It is worthy of note that Tanzania (one of the top three countries with prevalent income inequality and poverty level) and South Africa (the country with the highest unemployment rate in SADC) are also among the top three SADC countries, including Mauritius, with the highest tourism revenue in the region. This potential linkage between income inequality and tourism development could result from intervening factors, such as institutional quality, differences in tourism dependency and income group (Incera & Fernandez, 2015; Nguyen et al., 2020).

Generally, tourism development is still at its nascent stage in most Sub-Saharan African countries, given that the region's average tourism receipts between 1995 and 2019 are a meagre 2.1% of the World's total tourism revenue (WDI, 2020). Nonetheless, the SADC region contributes an average of 58.2% to SSA's total tourism revenue between 1995 and 2019 but only 1.2% to global tourism revenue, with South Africa contributing as much as 60.3% to total SADC tourism revenue within the period (WDI, 2020). The substantial contribution of the SADC region to SSA's total tourism revenue shows that tourism development in the region has transited from the pre-takeoff stage to the takeoff stage, and its low overall contribution to global tourism revenue shows that tourism development in the SADC region is far from reaching the maturity stage. However, the COVID-19 pandemic depressed the tourism sector's performance as economic activities across the World were grounded for most of 2020 (Bolaji et al., 2021; Henseler et al., 2022; Musavengane & Leonard, 2022; Olanrewaju & Afolabi, 2022). The ban on international travel as a containment measure against the spread of the pandemic not only deterred tourism arrivals but also crippled all tourism-related economic activities and drastically reduced tourism receipts across the World, including the SADC region (Musavengane & Leonard, 2022; Omarjee, 2021).

Moreover, empirical shreds of evidence show that tourism development has varying distributional effects such that while it is capable of worsening income inequality (see, Alam & Paramati, 2016; Incera & Fernandez, 2015; Raza & Shah, 2017), it also has the potential to narrow income gaps (see, Fang et al., 2020; Li et al., 2016; Lv, 2019). The rationale behind the inequality-worsening effect of tourism is that tourism development engenders economic growth through increased demand for goods and services, which could lead to inflation and push up asset prices, thereby widening the degree of income inequality (Alam & Paramati, 2016). Moreover, Stabler et al. (2010) argued that the dominance of transnational companies (TNCs) over small local firms in the tourism market not only stifles the performance of the local firms but also poses severe entry barriers to new local corporates, which ultimately deepens the income inequality both in the TNCs' country of operation and, by extension, their home country. In addition, tourism development can worsen socioeconomic conditions, aggravating poverty levels and exacerbating income inequality (Cárdenas-García et al., 2015; Nguyen et al., 2020; Raza & Shah, 2017). More so, regions with large tourist attraction centres are likely to receive more developmental attention than regions with low tourist sites, which worsens income inequality. However, Blake (2008) argued that income inequality could only be further exacerbated if low-income earners are exempted from actively participating in tourism-related activities.

Nevertheless, the proponents of tourism development alluded that its benefits are diverse. Ashley and Mitchell (2009) and Saarinen et al. (2013) classified the benefits of tourism into three major effects: direct, secondary and dynamic effects. The direct effect deals with the tourism sector's employment-generating potential, which helps bridge income gaps. The secondary effect relates

to strengthening the supply chains in the local community such that local traders and suppliers are allowed access to meet tourists' demand for consumer goods and services. The dynamic effect relates to structural changes indirectly linked to tourism development, such as self-sufficiency from in-house facility development. Other notable benefits of tourism development include a viable source of foreign exchange earnings, foreign investment (capital inflow) and government (tax) revenue (Alam & Paramati, 2016; Tang & Abosedra, 2014). In addition, since tourist attraction sites are primarily located in remote areas, the possibility of narrowing income gaps through tourism revenue in those areas is high (Nguyen et al., 2020).

In light of the aforementioned, the research questions pursued in this study are three-fold: (1) Does Tourism development significantly impact inequality in the SADC region? (2) Does the Kuznets Curve Hypothesis hold in the case of the tourism-inequality nexus in SADC? (3) Do tourism development and other intervening variables (corruption and FDI inflows) have any interactive effect (worsening or reducing) on income inequality in the SADC region?

The rest of the study proceeds as follows. The major thrust of Section 2 is constructing a composite tourism index and some stylized facts. Section 3 entails the review of the empirical literature on the tourism-inequality nexus. Section 4 contains the methodology and data. Section 5 entails empirical analysis and discussion of results. Section 6 concludes the study.

2. Building a composite tourism development index and stylized facts

2.1. Procedure for computing the composite tourism development index

We collect the raw data on three disaggregated tourism development indicators – share of SSA's international arrivals, international tourism expenditure (% of total imports) and global tourism receipts (% of total exports) – from the World Bank's World Development Indicators.[1] In line with Transparency International's approach to computing the corruption perception index, we subject our data to standard normalization, with zero mean and unit variance. We, then, adopted the year 2014 – when many commodity-dependent developing countries (African economies, inclusive) suffered a huge revenue loss due to a plunge in global commodity prices, remarkably the price of crude oil – as the base year for computing the index. At that point in time, the affected countries explored alternative revenue sources, such as deepening foreign exchange earnings from the travel and tourism sector.

We normalize the data on the indicators using the Z-score as follows:

$$Z_{t,j} = \frac{X_{t,j} - \overline{X_j}}{\sigma_{X_j}} \tag{1}$$

Where: $Z_{t,j}$ = Z-score for indicator j at time t; $X_{t,j}$ = The value of indicator j at time t; $\overline{X_j}$ = Mean for indicator j across time t; σ_{X_j} = Standard deviation for indicator j across time t

We obtained the mean and standard deviation for the distribution by utilizing the 2014 base year values (raw data) across the three tourism development indicators. We after that, obtain a sub-index for each of the tourism indicators using the following:

$$\check{X}_{t,j} = (Z_{t,j} * \mu_{2014} + \sigma_{2014}) \tag{2}$$

Where: $\check{X}_{t,j}$ = Standard normal version of $X_{t,j}$; μ_{2014} = Mean for the distribution across the three tourism development indicators at the 2014 base year; σ_{2014} = Standard deviation for the distribution across the three indicators at the 2014 base year.

Lastly, we take the average of the three sub-indices to determine the time-varying composite tourism index, and this is replicated for each of the 15 member-states of the SADC[2] over the period from 2010 to 2019. The choice of the time scope is premised on the need to reflect more recent data points on tourism development in the aftermath of the 2007 global financial crisis and the 2008–09 Great Recession.

2.2. Stylized facts on tourism development indicators in the SADC region

The level of tourism development varies across SADC countries based on the performance of each country's tourism sector. The industry's average performance using different indicators (tourism revenue, tourism expenditure and tourism arrivals), as shown in Figure 1, confirms this notion. Regarding international tourism arrivals between 2010 and 2019, South Africa attracts the highest number of international tourists in the SADC region throughout the period under consideration. Specifically, the share of South Africa in total sub-Saharan Africa's international tourists averaged 29%, suggesting that South Africa accounts for more than a quarter of international tourism arrivals in SSA. This impressive feat is explained by the successful implementation of policies that enhance tourism development (such as the Tourism Act of 2014 and the Tourism Sector Recovery Plan) and South Africa's distinctive features coupled with her highly captivating natural and cultural diversity (Tibane, 2021). However, the average contribution of each of the other countries in the SADC region to total SSA international tourist arrivals is significantly less than 10%.

Apparently, the number of international tourism arrivals influences a country's tourism revenue. However, despite South Africa being a major destination for international tourists to SSA, the country's tourism revenue as a percentage of its total exports is among the lowest (below 10%) in the SADC region. This shows that South Africa is not a tourism-dependent country. However, the narrative is different for tourism-dependent SADC countries like Comoros, Lesotho, Madagascar, Mauritius, Seychelles and Tanzania[3], whose tourism revenue (% of total exports) is significantly more than 10%. Worthy of mention is Comoros, the country with the highest tourism revenue (% of total exports) in the SADC region. The tourism sector in Comoros contributes more than 50% to the country's total exports, indicating that the tourism sector is a significant source of foreign exchange for the country.

Similarly, Comoros has the highest volume of tourism expenditure (% of total imports) in the SADC region, closely followed by Lesotho. The share of the other SADC countries' tourism expenditure in total imports is less than 10%, suggesting that these countries are unlikely to be susceptible to tourism-related domestic shocks, particularly depreciation or devaluation that makes imports dearer (Adekunle et al., 2019; Ogunjimi, 2020) and global shocks such as the COVID-19 pandemic. However, countries like Comoros and Lesotho, whose tourism expenditure accounts for a larger share of their total imports, should be more concerned about the huge consequential bills spent on outbound tourism, whereas foreign exchange could have been saved for other productive uses. This suggests the need for these countries to develop their tourist attraction sites to diversify their revenue sources.

The average values of the newly computed composite tourism index for SADC countries in 2010–2019 are represented graphically in Figure 2. In terms of regional economic communities[4] in Sub-Saharan Africa (SSA), the SADC region has the highest average tourism index of 30.1 points, followed by the East African Community (EAC) with its average tourism index of 29.9 points, Economic

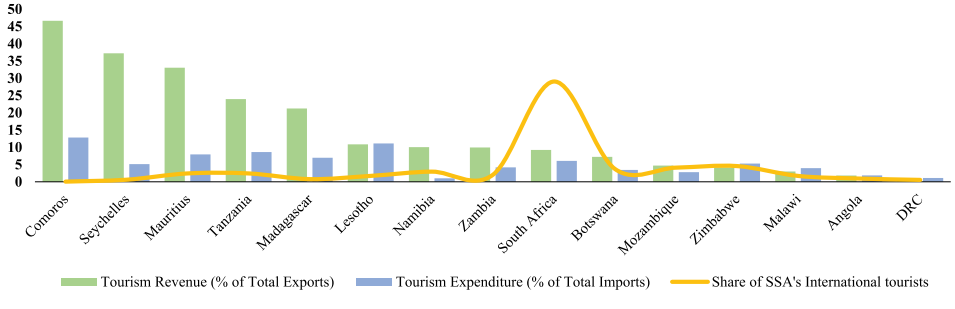

Figure 1. Tourism Development Indicators. This figure depicts the average performance of tourism indicators in SADC countries over the period of 2010–2019. Source: Based on Data extract from the World Development Indicators (WDI, 2020).

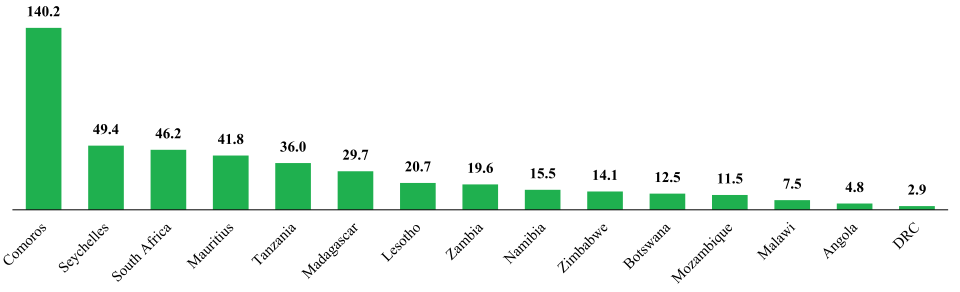

Figure 2. Composite Tourism Index (points). This figure represents the average values of the composite tourism index for SADC Countries in 2010-2019. Source: Based on disaggregated tourism data extract from WDI (2020).

Community of West African Countries (ECOWAS) at 21 points and Economic and Monetary Community of Central African States (CEMAC) at 12.2 points. The first two sub-regions outperformed the SSA's average of 27.1 points. On a country level, Comoros has the highest tourism index at 140.2 points in SSA and the SADC region, giving further credence to its tourism-dependent nature. Other SADC countries that outperformed the SSA's average on the index include Seychelles (49.4 points), South Africa (46.2 points), Mauritius (41.8 points), Tanzania (35.9 points) and Madagascar (29.7 points). The remaining SADC member-states have their average tourism index below the SSA and SADC averages. The high rank of the SADC on the tourism index cannot be disconnected from the implementation of the Protocol on the Development of Tourism and the creation of the TransFrontier Conservation Areas, which contributed to the remarkable improvement in service delivery, infrastructural development and safety standards (SADC, 2012).

3. Review of the literature

3.1. The theoretical literature – The Kuznets Curve Hypothesis

The Kuznets Curve Hypothesis suggests that the impact of tourism development on income inequality depends on a country's development stage. In other words, tourism development may widen the income inequality gap at the initial stage of development but bridge the gap as certain stages of development are reached (Alam & Paramati, 2016). The rationale behind the inequality-worsening effect of tourism is that tourism development engenders economic growth through increased demand for goods and services, which could lead to inflation and push up asset prices, thereby widening the degree of income inequality (Alam & Paramati, 2016). Conversely, some proponents of tourism development have alluded to its benefits to include direct, secondary and dynamic effects. The direct effect revolves around the employment-generating potential, which helps to bridge income gaps. The secondary effect relates to strengthening the local community's supply chains, giving room for the locals to meet tourists' demand for goods and services. Lastly, the dynamic effect relates to structural changes indirectly linked to tourism development, such as self-sufficiency from in-house facility development (Ashley & Mitchell, 2009; Saarinen et al., 2013).

3.2. The empirical literature

The tourism-inequality literature is quite diverse, with the dominance of cross-country studies over country-specific evidence, given that tourism usually involves two or more countries. Accordingly, the empirical evidence on the tourism-inequality nexus is mixed, as some studies reported a positive or negative relationship while others reported a significant or insignificant relation. The strand of the literature in support of a positive relationship between tourism and income inequality indicates that tourism development widens the income gap (Alam & Paramati, 2016; Nguyen et al., 2020; Raza &

Shah, 2017). The basic idea behind this positive relationship is that tourism development worsens income inequality by making the poor poorer and the rich richer. In their case, Peng et al. (2023) analyzed the effects of the tourism market diversification (TMD) strategy on the economic growth of 75 tourist destinations globally over the period 1995-2018. Exploring the dynamic system GMM approach, the study established that the TMD strategy accelerates economic growth in tourist destinations, and the results are robust for different sub-samples of countries. Meanwhile, the growth effect of the TMD in low and lower-middle-income groups is significantly higher than in high and upper-middle groups.

Another strand of the literature argues for a negative relationship between tourism development and income inequality (Fang et al., 2020; Lv, 2019; Seetanah et al., 2023; Zhang & Yang, 2023). This perspective portrays tourism activities as pro-poor in that tourism creates employment opportunities for low-income earners in producing tourism-based products and services, thereby moving low-income earners up the income ladder and reducing the prevailing income gaps in the economy (Alam & Paramati, 2016). Nonetheless, Alam and Paramati (2016), Chi (2020) and Fang et al. (2020) argued that the tourism-income inequality nexus is significant in developing countries but insignificant in developed economies. This is because tourist attraction centres are more concentrated in developing economies than in developed economies, as well as the relatively low-income level and institutional qualities in developing economies (Tang & Tan, 2018). Nevertheless, Mahadevan and Suardi (2017) argued that tourism growth does not significantly influence income distribution.

The Kuznets Curve hypothesis has been extensively adopted in several past empirical studies (see Alam & Paramati, 2016; Chi, 2020; Kumail et al., 2023; Nguyen et al., 2020; Uzar & Eyuboglu, 2019; Wang & Tziamalis, 2023), which confirmed the validity of the Kuznets Curve hypothesis, especially in developing countries. The hypothesis suggests the possibility of a non-linear relationship between tourism development and income inequality. Similarly, some studies have contributed to the non-linearity debate by identifying the channels through which tourism development influences income inequality, including institutional quality (see Nguyen et al., 2020) and the income status of countries (see Incera and Fernandez (2015).

Blake et al. (2008) and Incera and Fernandez (2015) identified the three main channels tourism development influences income inequality: price, earning, and tax. First, tourism activities raise the cost of recreational, cultural, hotel and hospitality services usually consumed by high-income households, which spills over, in little proportion, to the prices of consumer goods, thus, reducing income inequality gaps and generating a price effect (Incera & Fernandez, 2015). Second, tourism fosters self-employment in transport, restaurant, accommodation and other hospitality services, which could increase the income of the service providers over other economic agents, thus, engendering income disparity and generating an earning effect. However, Fang et al. (2020) argued that the earning effect generated through increased employment opportunities could reduce poverty and income inequality, especially if the poor engage in tourism-based goods production. In line with this empirical proposition, Mahadevan and Suardi (2017) found that tourism growth led to the decline in poverty and income inequality rates in 13 tourism-intensive economies, and Folarin and Adeniyi (2019) found that tourism development contributes to poverty reduction in Sub-Saharan African countries.

Third, the tax revenue accruing to the government increases with increasing tourism activities. This could increase the government's expenditure on the tourism sector at the expense of other sectors, thus generating a tax revenue effect and potentially widening income gaps across sectors. Succinctly, tourism widens income inequality gaps through the tax-revenue and earning effects but reduces income inequality through the price effect. Intuitively, whereas the tax revenue effect and earning effect support the positive tourism-income inequality nexus strand of the literature, the price effect is in accordance with the strand of the tourism-inequality literature arguing for an inverse relationship. However, Blake et al. (2008) averred that the magnitude of each effect, usually determined by a country's income level, determines the net effect of tourism on income inequality.

Moreover, Dossou et al. (2023) assessed the impact of tourism development on income inequality while controlling for the role of governance quality on the tourism-income inequality nexus in 30 Asian countries over the period 1996–2020. Using the dynamic ordinary least square (DOLS) and panel-corrected standard errors (PCSE) estimation techniques, the study established that the impact of tourism on income inequality is positive and statistically significant. However, the results showed that the impact of governance quality on income inequality is negative and statistically significant. Also, the study observed that governance quality moderates the nexus between tourism and income inequality.

Regarding the causal relationship between tourism development and income inequality, Raza and Shah (2017) and Lv (2019) document evidence in support of unidirectional causality running from tourism to income inequality, while Chi (2020) supports the causality running from income inequality to tourism in developing countries. In addition, Raza and Shah (2017), Chi (2020), and Kumail et al. (2023) provide evidence of a two-way causality between income inequality and tourism development, indicating that tourism development and income inequality are cause and effect of each other. Regarding the estimation techniques employed to examine the tourism-income inequality nexus, recent studies (see Alam & Paramati, 2016; Chi, 2020; Fang et al., 2020; Lv, 2019; Raza & Shah, 2017) employed the fully modified ordinary least squares method. Some other studies employed the causality test to confirm the direction of causality between tourism development and income inequality (see Katircioğlu, 2014; Tugcu, 2014), panel vector autoregression (see Mahadevan & Suardi, 2017), dynamic ordinary least square (see de Vita et al., 2015; Katircioğlu, 2014) and system generalized methods of moment (see Folarin & Adeniyi, 2019).

Similarly, past studies have used different proxies in measuring tourism development. For example, Alam and Paramati (2016), Li et al. (2016), Mahadevan and Suardi (2017), Raza and Shah (2017), and Chi (2020) used tourism receipts; Katircioğlu (2014), de Vita et al. (2015) and Nguyen et al. (2020) used international tourist arrivals; Nguyen et al. (2020) used tourism investment; and Tugcu (2014), Fang et al. (2020) and Nguyen et al. (2020) used tourist expenditure to proxy tourism development. However, Lv (2019) and Adeniyi, Kumeka, et al. (2021) argued for computing a tourism index using a Principal Component Analysis (PCA) to aggregate all proxies of tourism development.

Nguyen et al. (2020) argued that the choice of proxy for tourism development matters in its nexus with income inequality. They found that domestic tourism indicators directly impact income inequality, while international tourism indicators are inversely related to income inequality. They also showed that the tourism-income inequality nexus is sensitive to regional characteristics. This stance is further substantiated by Li et al. (2016), who alluded that tourism development substantially reduces regional inequality, with domestic tourism contributing more than international tourism. In addition, Adeniyi, Kumeka, et al. (2021) investigated the link between inclusive growth and tourism in 45 African countries spanning the period of 1995 to 2019 within the frameworks of the panel vector autoregression (pVAR) and the panel system generalized method of moments (GMM). Results showed a weak positive effect of international tourism arrivals and the composite tourism indicator on inclusive growth, while tourism receipts and expenditure insignificantly decreased inclusive growth in the sampled African economies.

To this end, the null hypotheses subject to validation in this study are three-fold: (1) Tourism development has no significant impact on inequality in the SADC region; (2) The Kuznets Curve Hypothesis is not valid in the case of the tourism-inequality nexus in SADC; (3) Tourism development and other intervening variables (corruption and FDI inflows) do not have any interactive effect (worsening or reducing) on income inequality in the SADC region.

In addition, to reiterate the contributions of this study to knowledge, the first novelty of this study lies in its central focus on Southern African Development Community (SADC) countries, as this region consists of developing countries with high income inequality and constitute attractive tourist centres in Sub-Saharan Africa. Alam and Paramati (2016) argued that income inequality is more common in developing economies than in developed countries. A similar study on the SADC region by

Makochekanwa (2013) focused on the tourism-growth nexus and confirmed a direct relationship between tourism revenue and economic growth but ignored the distributional effects of tourism development. More so, few studies on the tourism-inequality-poverty nexus have instead focused on individual member states of SADC. For example, Kinyondo and Pelizzo (2015) evaluated the impact of tourism development on income inequality in Tanzania, while Sharpley and Naidoo (2010) examined how tourism development affects poverty in Mauritius. Secondly, for robustness' sake, this study employs disaggregated and composite tourism development indicators to evaluate the tourism-income inequality nexus in the SADC region.

Thirdly, to our knowledge, this is the first study to compute a composite tourism index using an approach other than the traditional approaches, such as principal component analysis (PCA) and factor analysis (FA). Unlike the PCA and FA approaches which generate the tourism index by ensuring that the index significantly approximates (say over 70%) the combination of the individual tourism indicators, our approach utilizes the z-score method in line with Transparency International's methodology of computing the corruption perception index annually. Unlike the PCA and FA, our proposed approach is premised on a base year that is not arbitrarily selected and is equally ignored by traditional approaches. Lastly, the current study employs the panel quantile regression approach to evaluate the nexus between tourism development and income inequality and the intervening variables that connect the two. This regression analysis is premised on the fact that the dependent variable (income inequality index) is relatively stable for within-country data points but is not for between-country data points. Thus, it is necessary to state that static panels, which house the quantile regression, become a plausible alternative to dynamic panels.

4. Methodology and data

We rely on the quantile regression approach Koenker and Bassett Jr (1978) proposed within the panel data setting. Quantile regression provides estimates of the linear relationship between explanatory variables and a specified quantile of the dependent variable. One important special case of quantile regression is the least absolute deviations (LAD) estimator, which corresponds to fitting the conditional median of the response variable. A typical panel quantile regression can be specified as follows (see Table 1):

$$y_{it} = x_{it}^{'}\beta_{\tau} + \varepsilon_{it} \text{ and } Quant_{\tau}(y_{it}/x_{it}) = x_{it}^{'}\beta_{\tau} \tag{3}$$

The panel quantile regression is preferred to heterogeneous dynamic panels, including the Generalized Methods of Moments and the panel autoregressive distributed lag (ARDL), in that the former requires larger cross-sectional units and smaller periods, whereas the latter requires larger periods and smaller cross-sectional units (see Adeniyi, Ogunjimi, et al., 2021; Peng et al., 2023; Zaman, 2023). Static panels, including fixed-effect, random-effect and quantile models, are utilized whereby there are smaller cross-sectional units and periods (Ihebuluche et al., 2022). Meanwhile, the use of the quantile regression approach becomes plausible in the current study because the first two static models do not consider the variability in the data distribution on the dependent variable of interest – income inequality.

Table 1. Variable description.

Symbol	Definition
y_{it}	The response variable – *gini* is the inequality index
x_{it}	A vector of explanatory variables which includes: *t_index* is the composite tourism index; *tex_m* is tourism expenditure (% of total imports); *trr_x* is tourism revenue (% of total exports); *s_arrival* is the share of SSA's international tourism arrivals; *cpi* and *fdi* are corruption perception index score and net FDI inflows (% of GDP), respectively;
β_i	A vector of parameters – the intercept and partial slope coefficients – to be estimated
ε_{it}	A vector of disturbance terms
$Quant_{\tau}(y_{it}/x_{it})$	This symbol implies the τ^{th} conditional quantile of y_{it} given the value(s) of x_{it}

In specific terms, we explored alternative specifications that capture the non-linear effect of the tourism indicators by including the squared terms of the tourism indicators in separate models for income inequality. We also captured the role of intervening factors (including net FDI inflows and corruption index score) in the nexus between income inequality and tourism development by introducing the interaction terms of each tourism indicator (aggregate and disaggregated) and each of net FDI inflows and corruption index score in separate models. In all, we estimated a total of 16 models of income inequality.

As mentioned earlier, our study was delimited to 15 SADC member-states for which the relevant data points are available from 2010 to 2019. We obtained the data points on tourism revenue (% of total exports), tourism expenditure (% of total imports), the number of international arrivals (from which the SADC's share of total international arrivals in SSA was computed), and net foreign direct investment (FDI) inflows were sourced from the World Bank's World Development Indicators. In addition, we obtained the data points on the Gini coefficient or income inequality index from Standardised World Income Inequality Database (SWIID) generated by Solt (2019). Finally, we obtained the corruption perception index (CPI) from the database of Transparency International (2020), which computes the index on about 180 countries annually.

5. Empirical analysis and discussion of results

5.1. Descriptive analysis

The statistical properties of the variables employed in this study are summarized in Table 2. The income inequality index for the SADC region measured by the Gini coefficient averaged 53.1 points over the period of 2010 to 2019. High-income inequality countries also characterize the region as the maximum Gini coefficient is 69 index points.[5] There are observed dynamics across tourism indicators in the region. The share of the SADC region in SSA's international tourist arrivals averaged 3.8% over the study period. Notably, South Africa has the highest average share of international arrivals at 32%. On the other hand, the SADC countries whose average shares of total SSA arrivals are less than 1% include Comoros (0.1%), Democratic Republic of Congo (DRC) (0.5%), Madagascar (0.8%), Seychelles (0.6%). The tourism revenue to total exports ratio and tourism expenditure to total imports ratio averaged 14.9% and 5.5%, respectively, between 2010 and 2019.

On a country level, Comoros has the highest tourism revenue ratio, while DRC has the lowest tourism revenue ratio. Conversely, both countries have the highest and lowest tourism expenditure ratios in the SADC region, respectively. Our newly computed composite tourism index averaged 30.2 points, with more contribution traced to Comoros, which has the highest tourism index in the region (refer to Figure 2). Moreover, the net FDI inflows[6] averaged 4.99% of GDP, while the corruption perception index (CPI) score[7] averaged 37 points. Notably, Botswana and DRC are the least corrupt and most corrupt nations in the SADC region, respectively, as the former has posted the highest CPI score while the latter has the lowest CPI score. Regarding the coefficient of variation (CoV), the highly volatile variable is the country's share of international arrivals in SSA, with the highest CoV of 180.18%. In contrast, the least volatile is the Gini coefficient, with the lowest CoV of 16.72%.

Table 2. Summary statistics.

Variable	Obs.	Mean	Std. Deviation	Coefficient of Variation (%)	Minimum	Maximum
gini	150	53.102	8.878	16.719	40.2	69
t_index	150	30.165	36.244	120.152	0.32	159.82
s_arrival	150	3.835	6.910	180.183	0.038	32.011
tex_m	150	5.483	3.572	65.147	0.42	14.64
trr_x	150	14.876	14.014	94.205	0	53.2
FDI	150	4.994	7.936	158.911	−6.369	57.838
cpi	150	37.320	13.787	36.943	15	66

Note: The coefficient of variance is the ratio of standard deviation to mean.
Source: STATA 12 Output

5.2. Correlation analysis

The pair-wise correlation coefficients between the variables employed in this study are presented in Table 3. A positive and strong correlation is observed between the composite tourism (development) index and tourism revenue ratio, on the one hand, and the tourism expenditure ratio, on the other hand. This suggests that the composite tourism index hugely reflects the two tourism indicators. Meanwhile, the share of SADC in SSA's international tourist arrivals is positively and weakly associated with the composite tourism index. Also, tourism revenue and expenditure ratios have a positive and moderate correlation. It is, therefore, plausible to capture the aggregated and disaggregated tourism indicators in separate models to avoid the problem of severe collinearity, particularly with the inclusion of the two tourism ratios in the same model.

There is a weak correlation between the four tourism indicators and the control variables (net FDI inflows and CPI score). This suggests that including the four tourism indicators and the two control variables in the same model will yield unbiased results. However, there are mixed results when considering the correlation between the inequality index and the four tourism indicators. While the composite tourism index and share of SSA's international arrivals are positively correlated with the inequality index, tourism revenue and tourism expenditure ratios are negatively associated with the inequality index. In addition, the CPI score is positively correlated with the inequality index, whereas net FDI inflows are negatively associated with the inequality index.

5.3. The panel quantile regression results

5.3.1. Linear & individual effects in the income inequality model

We start our analysis by considering a baseline model which estimates the linear effects of the explanatory variables on the dependent variable of interest (inequality index) at lower, middle/median and upper quantiles (see Table 4). Our results showed that the composite tourism index positively and significantly impacts inequality, particularly at the median and upper quantiles (see Case 1 in Table 4). Similarly, disaggregated tourism indicators (tourism revenue and expenditure ratios) are significantly inequality-worsening at the upper quantile only (see Cases 2 and 3 in Table 4). Meanwhile, the SADC's share of international arrivals in SSA significantly worsens inequality outcomes in the SADC region across the three quantiles (see Case 4 in Table 4). Moreover, the region's share of international arrivals in SSA is more inequality-worsening than other tourism indicators. Our results lend credence to the previous findings of Cárdenas-García et al. (2015); Incera and Fernandez (2015); Alam and Paramati (2016); Raza and Shah (2017); Nguyen et al. (2020).

Corruption positively and significantly impacts inequality outcomes, particularly at the median and upper quantiles. This result is robust to the choice of tourism indicator (see Cases 1–4 in Table 4). This suggests that the less corrupt a country is as its CPI score moves towards 100 points, the higher the income inequality rate. It is only in the case of the composite tourism index that less corruption significantly reins in the rate of income inequality, particularly at the lower quantile (see Case 1 of Table 4). Moreover, net inflows of FDI are significantly inequality-worsening at the median and upper quantiles across the four tourism indicators. However, our result negates the

Table 3. Correlation matrix.

	gini	*t_index*	*s_arrival*	*tex_m*	*trr_x*	*FDI*	*cpi*
gini	1.000						
t_index	0.067	1.000					
s_arrival	0.484	0.051	1.000				
tex_m	−0.117	0.700	−0.009	1.000			
trr_x	−0.246	0.801	−0.186	0.665	1.000		
FDI	−0.211	−0.124	−0.098	−0.027	0.027	1.000	
cpi	0.271	0.032	0.151	0.038	0.271	0.062	1.000

Source: STATA 12 Output.

Table 4. Linear Effect Models of Income Inequality in the SADC region.

	CASE 1			CASE 2			CASE 3			CASE 4		
	gini_25	*gini_50*	*gini_75*	*gini_25*	*gini_50*	*gini_75*	*gini_25*	*gini_50*	*gini_75*	*gini_25*	*gini_50*	*gini_75*
t_index	0.002	0.047***	0.028***									
	(0.002)	(0.0086)	(0.089)									
tex_m				−0.829***	−0.087	0.226*						
				(0.193)	(0.169)	(0.119)						
trr_x							−0.465***	−0.361***	0.060**			
							(0.031)	(0.027)	(0.025)			
s_arrival										0.365***	0.462***	0.365***
										(0.118)	(0.078)	(0.118)
cpi	−0.025***	0.307***	0.511***	−0.027	0.313***	0.509***	0.392***	0.338***	0.487***	0.220***	0.306***	0.220***
	(0.006)	(0.227)	(0.022)	(0.052)	(0.043)	(0.023)	(0.031)	(0.027)	(0.022)	(0.0475)	(0.039)	(0.048)
fdi	−0.002	−0.248***	−0.216***	−0.035	−0.254***	−0.257***	0.007	−0.133***	−0.252***	−0.233***	−0.215***	−0.233***
	(0.063)	(0.341)	(0.430)	(0.053)	(0.065)	(0.497)	(0.042)	(0.045)	(0.042)	(0.088)	(0.059)	(0.088)
constant	46.888***	43.168***	40.961***	52.334***	44.255***	41.339***	39.285***	45.169***	42.261***	49.035***	41.837***	49.035***
	(0.262)	(0.945)	(0.907)	(2.607)	(1.931)	(0.896)	(1.460)	(1.043)	(0.729)	(1.966)	(1.583)	(1.966)
R^2	0.011	0.158	0.257	0.031	0.129	0.219	0.147	0.198	0.229	0.174	0.232	0.309

Note: ***, **, * indicate the significance of coefficients at 1%, 5% and 10%, respectively; the values in parentheses are standard errors. CASE 1, CASE 2, CASE 3 and CASE 4 have tourism indicators defined as the composite tourism development indicator, tourism expenditure-import ratio, tourism revenue-export ratio, and the share of SSA's international tourism arrivals, respectively. The control variables are the corruption perception index score and net FDI inflows (% of GDP), respectively. The terms *gini_25*, *gini_50* and *gini_75* represent the income inequality models with lower, middle (median) and upper quantiles, respectively. Refer to **Footnote 5** to observe the variability in inequality distribution across the 15-member states of the SADC region captured in this study; hence, the choice of quantile regression to determine the responsiveness of income inequality to the explanatory variables of interest at different quantiles – lower, middle and upper.

Source: STATA 12 Output.

findings of Stabler et al. (2010) that the dominance of transnational companies over domestic firms deepens the rate of income inequality in the host country. With the coefficient of determination ranging from 12-31%, the inequality outcomes in the SADC region are best explained by the tourism indicators, net FDI inflows and corruption, particularly at the median and upper quantiles.

5.3.2. Linear and non-linear effects in the income inequality model

We also test for the validity of the Kuznets curve, which hypothesizes a non-linear relationship between tourism development and inequality outcomes. We capture the non-linear effect by including the square terms of the four tourism indicators in separate models while controlling for the linear effects of the control variables, including net FDI inflows and corruption (see Table 5).

Our results are mixed regarding the validity of the hypothesis. Nonetheless, we observed a U-shape relationship between inequality outcomes and the aggregate and disaggregated tourism indicators at both the median and upper quantiles (see Cases 2 and 3 in Table 5) and at both the lower and median quantiles (see Case 1 in Table 5) and at the upper quantile only (see Case 4 in Table 5). These results suggest that tourism is income inequality-reducing at the early stages of development of SADC countries, but it becomes inequality-worsening at their later stages of development. Our results paralleled the previous findings of Alam and Paramati (2016), Uzar and Eyuboglu (2019), Chi (2020), and Nguyen et al. (2020). While these studies employed individual indicators of tourism development, our study validated the Kuznets curve effect/non-linear effect between tourism development and inequality outcomes using both the composite tourism indicator and the disaggregated tourism indicators.

Corruption positively and significantly impacts inequality incomes, particularly at the median and upper quantiles. This result is robust to the choice of tourism indicator (see Cases 1–4 in Table 5). This suggests that the less corrupt a country is as its CPI score moves towards 100 points, the higher the income inequality rate. In the case of the SADC's share of international arrivals in SSA, less corruption significantly reins in the rate of income inequality, particularly at the lower quantile (see Case 1 of Table 5). Moreover, net inflows of FDI are significantly inequality-worsening at the median and upper quantiles across the four tourism indicators. However, this result conflicts with the findings of Stabler et al. (2010). With the coefficient of determination in the range of 17-31%, the inequality outcomes in the SADC region are best explained by the tourism indicators and their squared terms, net FDI inflows and corruption, particularly at the median and upper quantiles.

5.3.3. Interactive effects in the income inequality model: role of corruption & net FDI inflows

We also contribute to the literature that the relationship between tourism development and inequality outcomes depends on intervening factors, including institutional quality measures, such as corruption (see Table 6) and FDI inflows (see Table 7). Except for the international arrivals measure of tourism development, which showed mixed results (see Case 4 in Table 6).[8] We established that tourism indicators positively and significantly impact income inequality at lower, median and upper quantiles (see Cases 1–3 in Table 6). As obtained earlier, we offer evidence that net FDI inflows are inequality-reducing, and the level of corruption worsens inequality (higher corruption perception index scores enhance the income gap in the SADC region). Meanwhile, we observed that the interaction between institutional quality (which is corruption in this case) and tourism indicators significantly improves inequality outcomes at the lower, median and upper quantiles (this is the case for all tourism indicators except the SADC's share of international arrivals in SSA measure of tourism development).[9]

We also affirmed our earlier findings that corruption positively and significantly impacts income inequality, particularly at the median and upper quantiles. This result is robust to the choice of tourism indicator (see Cases 1–4 in Table 6), suggesting that the less corrupt a country is as its CPI score moves towards 100 points, the higher the income inequality rate. It is only in the case of the SADC's share of international arrivals in SSA that less corruption significantly reduces the rate of income inequality, particularly at the lower quantile (see Case 4 of Table 6). Looking at

Table 5. Non-linear Effect/Kuznets curve models of income inequality in the SADC region.

	CASE 1			CASE 2			CASE 3			CASE 4		
	gini_25	*gini_50*	*gini_75*	*gini_25*	*gini_50*	*gini_75*	*gini_25*	*gini_50*	*gini_75*	*gini_25*	*gini_50*	*gini_75*
t_index	−0.289***	−0.253***	0.036									
	(0.073)	(0.042)	(0.0387)									
t_in_sq	0.002***	0.002***	−0.0001									
	(0.005)	(0.002)	(0.0003)									
tex_m				−2.759**	−3.618***	−2.627***						
				(1.312)	(0.797)	(0.502)						
tex_sq				0.205**	0.236***	0.169***						
				(0.082)	(0.057)	(0.036)						
trr_x							−0.268***	−0.413***	−0.286***			
							(0.094)	(0.133)	(0.102)			
trr_sq							−0.006***	0.001	0.007***			
							(0.006)	(0.003)	(0.002)			
s_arrival										0.777***	0.873*	−1.074**
										(0.051)	(0.013)	(0.457)
s_arr_sq										−0.001	−0.013	0.048***
										(0.017)	(0.013)	(0.014)
cpi	0.067	0.312***	0.506***	0.009	0.309***	0.398***	0.407***	0.333***	0.568***	−0.022***	0.287***	0.283***
	(0.051)	(0.312)	(0.026)	(0.097)	(0.059)	(0.031)	(0.021)	(0.037)	(0.035)	(0.045)	(0.039)	(0.034)
fdi	−0.035	−0.146* *	−0.217***	−0.025	−0.225**	−0.284***	−0.022	−0.129**	−0.241***	−0.0001	−0.196***	−0.120*
	(0.045)	(0.053)	(0.049)	(0.100)	(0.087)	(0.065)	(0.026)	(0.056)	(0.063)	(0.005)	(0.056)	(0.065)
constant	47.876***	46.448***	41.039***	54.325***	53.346***	52.082***	38.804***	45.404***	41.616***	46.260***	41.497***	49.321***
	(2.049)	(1.264)	(1.030)	(6.042)	(2.886)	(1.386)	(0.897)	(1.314)	(1.233)	(0.176)	(1.635)	(1.733)
R^2	0.064	0.184	0.257	0.048	0.203	0.271	0.161	0.198	0.235	0.174	0.237	0.310

Note: ***, **, * indicate the significance of coefficients at 1%, 5% and 10%, respectively; the values in parentheses are standard errors. CASE 1, CASE 2, CASE 3 and CASE 4 have tourism indicators defined as the composite tourism development indicator, tourism expenditure-import ratio, tourism revenue-export ratio, and the share of SSA's international tourism arrivals (*s_arrival*), respectively. The variables with 'underscore sq' represent the square terms of the tourism indicators in no particular order. The control variables are the corruption perception index score and net FDI inflows (% of GDP), respectively. The terms *gini_25*, *gini_50* and *gini_75* represent the income inequality models with lower, middle (median) and upper quantiles, respectively. Refer to **Footnote 5** to observe the variability in inequality distribution across the 15 member states of the SADC region captured in this study; hence, the choice of quantile regression to determine the responsiveness of income inequality to the explanatory variables of interest at different quantiles – lower, middle and upper.

Source: STATA 12 Output.

Table 6. Interactive effect models of income inequality in the SADC region – Role of corruption.

	CASE 1			CASE 2			CASE 3			CASE 4		
	gini_25	*gini_50*	*gini_75*	*gini_25*	*gini_50*	*gini_75*	*gini_25*	*gini_50*	*gini_75*	*gini_25*	*gini_50*	*gini_75*
t_index	0.246***	0.271***	0.275***									
	(0.034)	(0.028)	(0.029)									
index_cpi	−0.007***	−0.008***	−0.009***									
	(0.001)	(0.001)	(0.001)									
tex_m				2.897***	3.629***	1.655***						
				(0.329)	(0.707)	(0.169)						
tex_cpi				−0.135***	−0.129***	−0.052***						
				(0.009)	(0.019)	(0.005)						
trr_x							0.331***	0.713***	0.817***			
							(0.046)	(0.090)	(0.112)			
trr_cpi							−0.019***	−0.023***	−0.028***			
							(0.001)	(0.002)	(0.003)			
s_arrival										0.590***	−1.283	−2.941***
										(0.117)	(1.064)	(0.525)
arrival_cpi										0.004	0.041	0.077***
										(0.003)	(0.025)	(0.012)
cpi	0.128**	0.434***	0.649***	0.737***	0.745***	0.635***	0.501***	0.516***	0.798***	−0.027***	0.135*	0.010
	(0.052)	(0.035)	(0.039)	(0.046)	(0.103)	(0.027)	(0.027)	(0.049)	(0.003)	(0.009)	(0.072)	(0.033)
fdi	−0.053	−0.144***	−0.235***	−0.145***	−0.203**	−0.232***	−0.041	−0.122**	−0.183**	−0.0004	−0.188***	−0.161***
	(0.039)	(0.046)	(0.066)	(0.035)	(0.100)	(0.026)	(0.029)	(0.058)	(0.078)	(0.006)	(0.069)	(0.038)
constant	43.769***	39.437***	37.705***	32.383***	32.742***	37.919***	36.897***	37.861***	33.365***	46.533***	48.909***	57.743***
	(1.926)	(1.333)	(1.513)	(1.837)	(3.827)	(0.937)	(0.982)	(1.838)	(2.167)	(0.327)	(2.769)	(1.316)
R^2	0.047	0.233	0.262	0.176	0.217	0.311	0.257	0.354	0.420	0.175	0.242	0.337

Note: ***, **, * indicate the significance of coefficients at 1%, 5% and 10%, respectively; the values in parentheses are standard errors. CASE 1, CASE 2, CASE 3 and CASE 4 have tourism indicators defined as the composite tourism development indicator, tourism expenditure-import ratio, tourism revenue-export ratio, and the share of SSA's international tourism arrivals (*s_arrival*), respectively. The variables with 'underscore cpi' represent the interaction terms involving tourism indicators and corruption index score. The control variables are the corruption perception index score and net FDI inflows (% of GDP), respectively. The terms *gini_25*, *gini_50* and *gini_75* represent the income inequality models with lower, middle (median) and upper quantiles, respectively. Refer to **Footnote 5** to observe the variability in inequality distribution across the 15 member states of the SADC region captured in this study; hence, the choice of quantile regression to determine the responsiveness of income inequality to the explanatory variables of interest at different quantiles – lower, middle and upper.

Source: STATA 12 Output.

Table 7. Interactive effect models of income inequality in the SADC region – Role of net FDI inflows.

	CASE 1			CASE 2			CASE 3			CASE 4		
	gini_25	*gini_50*	*gini_75*	*gini_25*	*gini_50*	*gini_75*	*gini_25*	*gini_50*	*gini_75*	*gini_25*	*gini_50*	*gini_75*
t_index	0.014*	0.059***	0.043***									
	(0.008)	(0.009)	(0.015)									
index_fdi	−0.001	−0.020***	−0.023***									
	(0.002)	(0.002)	(0.002)									
tex_m				−0.636**	0.683***	0.307**						
				(0.257)	(0.133)	(0.155)						
tex_fdi				−0.022	−0.336***	−0.284***						
				(0.062)	(0.033)	(0.036)						
trr_x							−0.451***	−0.241***	0.069**			
							(0.034)	(0.034)	(0.029)			
trr_fdi							−0.004	−0.011***	−0.007***			
							(0.003)	(0.003)	(0.002)			
s_arrival										0.758***	0.344***	0.341**
										(0.008)	(0.093)	(0.140)
arrival_fdi										0.001	0.137***	0.022
										(0.003)	(0.032)	(0.027)
cpi	−0.021	0.323***	0.539***	−0.029	0.321***	0.465***	0.391***	0.347***	0.503***	−0.022***	0.302***	0.234***
	(0.026)	(0.023)	(0.037)	(0.068)	(0.029)	(0.026)	(0.031)	(0.032)	(0.024)	(0.004)	(0.042)	(0.057)
fdi	0.021	0.113**	0.012	0.058***	0.779***	0.582***	0.032	−0.060	−0.179***	−0.001	−0.677***	−0.279***
	(0.034)	(0.050)	(0.094)	(0.231)	(0.121)	(0.126)	(0.059)	(0.073)	(0.064)	(0.006)	(1.627)	(0.086)
constant	46.709***	42.318***	40.461***	51.411***	41.414***	43.280***	39.242***	43.894***	41.555***	46.271***	42.349***	48.683***
	(1.099)	(0.956)	(1.631)	(3.406)	(1.418)	(1.356)	(1.489)	(1.319)	(0.935)	(0.161)	(1.627)	(2.344)
R^2	0.012	0.227	0.308	0.033	0.222	0.311	0.149	0.202	0.249	0.174	0.251	0.312

Note: ***, **, * indicate the significance of coefficients at 1%, 5% and 10%, respectively; the values in parentheses are standard errors. CASE 1, CASE 2, CASE 3 and CASE 4 have tourism indicators defined as the composite tourism development indicator, tourism expenditure-import ratio, tourism revenue-export ratio, and the share of SSA's international tourism arrivals, respectively. The variables with 'underscore fdi' represent the interaction terms involving tourism indicators and net FDI inflows. The control variables are the corruption perception index score and net FDI inflows (% of GDP), respectively. The terms *gini_25*, *gini_50* and *gini_75* represent the income inequality models with lower, middle (median) and upper quantiles, respectively. Refer to **Footnote 5** to observe the variability in inequality distribution across the 15 member states of the SADC region captured in this study; hence, the choice of quantile regression to determine the responsiveness of income inequality to the explanatory variables of interest at different quantiles – lower, middle and upper.

Source: STATA 12 Output.

Table 7, we established that while tourism indicators generally worsen inequality in a few cases, less corruption exacerbates inequality in a few instances. In addition, except for the share of SSA's international tourists, the interaction of net FDI inflows and tourism indicators significantly reduces the income inequality in the SADC region.[10] This indicates that FDI positively impacts the SADC region's developmental objectives. Therefore, the member-states should encourage the inflow of FDI tied to improving socioeconomic outcomes in the region. With the coefficient of determination in the range of 20-31%, the inequality outcomes in the SADC region are best explained by the tourism indicators, net FDI inflows, corruption and the interactive terms at the median and upper quantiles.

6. Conclusion

We contribute to the debate on the nexus between tourism development and income inequality in the SADC region over the period of 2010–2019. One area of divergence with the existing literature is this study's construction of the time-varying composite tourism index other than the traditional approaches, as mentioned in earlier sections. Our tourism index was built along the methodology for computing the corruption perception index by Transparency International. For robustness' sake, we employed the aggregate and disaggregated tourism indicators. In addition, we utilized the quantile regression approach within the panel data setting involving 15 out of the 16 member-states of the SADC.

Our results showed that the composite tourism index positively and significantly impacts inequality, particularly at the median and upper quantiles. Similarly, disaggregated tourism indicators (tourism revenue and expenditure ratios) are significantly inequality-worsening at the upper quantile only. Meanwhile, the SADC's share of international arrivals in SSA significantly worsens inequality outcomes across the three quantiles. Corruption has a positive and significant impact on inequality outcomes, particularly at the median and upper quantiles, and this result is robust to the choice of tourism indicator. It is only in the case of the composite tourism index and the share of SSA's international tourist arrivals that less corruption is significantly inequality-reducing, particularly at the lower quantile**.** Moreover, net inflows of FDI are significantly inequality-reducing at the median and upper quantiles irrespective of the tourism indicators. This suggests that FDI that positively impacts the SADC region's developmental objectives should be encouraged among the member states.

Our study validated the Kuznets curve/non-linear effect between tourism development and inequality outcomes. We also observed that the interaction between institutional quality (corruption in this case) and tourism indicators significantly depresses income inequality at the lower, median and upper quantiles (except for the share of SSA's international arrivals measure of tourism development). Therefore, we suggest that the SADC member-states improve their institutional quality by conscientiously fighting anti-graft in the region to ensure that tourism development delivers improved social inclusion outcomes (by reducing the income gap).

Remarkably, Botswana – also a member of the SADC region – has maintained its ranking as the least corrupt nation in Africa over time. The country has achieved this feat through the practice of a Treasury Single Account (TSA), a whistle-blowing policy, and an open-door policy. Consequently, the non-resource-dependent economy has one of the highest degrees of government effectiveness and fiscal discipline (in terms of compliance with the 3% of GDP fiscal deficit target in SSA (IMF, 2023; World Bank, 2023). Except in a few cases, the interaction of net FDI inflows and tourism indicators significantly reduces income inequality in the SADC region. To this end, there is an urgent need for education reforms to enhance manpower development in the SADC region so that FDI inflows into the tourism and hospitality industry would unlock more job opportunities for the locals. Doing this would avert avoidable internal crises in the SADC, such as the xenophobic attacks on foreign nationals in South Africa that started in 2019. These are medium-term to long-term measures that could be leveraged by the authorities of the SADC countries to avert internal crisis and civil disobedience, as obtained in South Africa in 2019–20.

Our study showed that tourism development is critical in bridging income gaps in the SADC region. This suggests that the region's governments and other stakeholders need to devise pragmatic approaches to fostering tourism development. This could include formulating and implementing tourism-enhancing policies and creating a conducive business environment wherein tourism can thrive. This will create tourism-related jobs that narrow income gaps and promote welfare across the SADC region. This is a short-term to medium-term approach which the SADC countries' governments could explore to harness the benefits of tourism development for social inclusion (job creation, poverty reduction, and income inequality reduction).

Against the backdrop of the COVID-19 outbreak in 2020, we suggest that subsequent studies investigate the possible role of the global pandemic in the nexus between tourism development and inequality, particularly when long time-series data become available. In this way, future studies could ascertain if the pandemic constitutes a key structural disturbance in the tourism-inequality nexus. This ultimately assists in determining the resilience level of the tourism sector in the SADC region. Lastly, we suggest that future studies employ the traditional approach and our proposed approach in this study to determine if the impact of the tourism index on income inequality is sensitive to the choice of methodological approach.

Notes

1. See https://data.worldbank.org/
2. Eswatini was excluded from the 16 member-state SADC region due to data unavailability.
3. Except for Tanzania, these countries have been classified by the International Monetary Fund (IMF) as non-resource-dependent.
4. The EAC countries captured here include Rwanda, Uganda, Sudan, Tanzania and Uganda. The ECOWAS member-states include Cape Verde, Gambia, Nigeria, Senegal, Togo, Guinea-Bissau, Ghana, Mali, Niger, Burkina Faso, Cote d'Ivoire and Benin. The CEMAC countries captured here include Cameroon and the Congo Republic.
5. The SADC countries having an average inequality index that is greater than 50 index points in the study period (2010-2019) include Angola (53.1 points), Botswana (63.2 points), Comoros (58.2 points), Lesotho (57.9 points), Namibia (68.7 points), South Africa (68.6 points), and Zambia (59.4 points). Other countries in the SADC region have a moderate inequality index that is less than or equal to 50 points. They include the Democratic Republic of Congo (46.3 points), Madagascar (46.3 points), Mauritius (40.3 points), Malawi (48.4 points), Mozambique (50 points), Seychelles (45.5 points), Tanzania (41.1 points), Zimbabwe (49.6 points).
6. Angola is the only SADC nation with negative net FDI inflows or net FDI outflows.
7. Transparency International's definition of CPI score ranges between 0 (less clean/most corrupt) and 100 (most cleaner/corrupt-free). The closer the CPI score is to 100, the less corrupt a country is, whereas the closer the CPI score is to zero (0), the more corrupt a country is.
8. Here, our result affirms the earlier findings of a negative effect of tourism development on inequality outcomes (see Li et al., 2016; Lv, 2019; Fang et al., 2020)
9. This result correlates with the findings of Nguyen et al. (2020) that institutional quality matters in the nexus between tourism development and inequality.
10. This ultimately negates the findings of Stabler et al. (2010) that the increasing presence of transnational or multinational companies worsens income inequality in the host country.

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