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Modeling the determinants of tourism diversification: An empirical analysis for Australia

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Abstract
This paper aims to use an augmented tourism demand model to examine the determinants of tourism diversification by using the data from 46 tourism markets and seven tourism activities in Australia from 1987 to 2021. The tourism markets in Australia have been further divided into sub-regions, and each region has been analyzed. The empirical evidence shows that an increase in the average income in the source markets and infrastructure investment in Australia increases tourism diversification. At the same time, the relative price effect appears to hinder Australia's tourism market diversification. Political risk has not been shown to have a significant impact on Australia's tourism market diversification. Policy conclusions and discussions related to the empirical results are presented in the main body of the paper.

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Data Availability Statement included at the end of the article

Keywords
tourism diversification, tourism market, tourism activities, augmented tourism demand model, Australia

Introduction

Tourism activities have proliferated since the 1960s thanks to technological advances in land, sea, and air transport. Since tourism is a specific export form, it decreases current account deficits, enhances employment levels by promoting investment, creates new jobs, and increases tax revenues (Song et al., 2023; Okumus and Erdogan, 2021). Therefore, tourism is an essential source of economic growth with its positive influences and externalities on the economy and its spillover effects on other economic activities such as transportation and travel, recreation, food, entertainment, and agriculture. Tourism activities can stimulate capital formation and production by enabling the import of required machinery through foreign exchange earnings (Can and Gozgor, 2018). Tourism can provide a Keynesian stimulus to host countries, which in turn promotes the countries' economic growth.

Increasing the number of tourist arrivals has become a significant goal for many countries, owing to the benefits provided by the tourism. Therefore, diversifying the number of tourism partner markets and the diversity of activities in tourism destinations has become more critical. Yap (2022) stated that the most characteristic contributions of the tourism market diversification strategy can be unveiled under two topics. First, it can help policymakers to determine potential source markets successfully. Second, tourism market diversification can ensure the minimization of uncertainties and risks resulting from external factors such as adverse demand shocks and political turmoil. Weidenfeld (2018) stated that success in the tourism depends on the degree of diversification. Therefore, diversification of tourism potentials can provide more employment alternatives. Moreover, tourism can be an alternative to traditional economic activities such as agriculture and labor-intensive manufacturing (Sharpley, 2002). Given the potential fragility of source markets (e.g., economic crises, political turmoil, changing habits and preferences, etc.), tourism diversification can minimize the risk of fluctuations in arrivals and revenues (Can and Gozgor, 2018).

Moreover, Szivas and Riley (1999) emphasized that tourism diversification can be "a port in the storm" for destination countries during economic turmoil. Thus, diversification of tourism markets and activities can offset the collapse of employment and foreign exchange earnings in other specific activities. Tourism diversification can help absorb unemployment among unskilled workers and play a significant role in enabling the host country to increase tourism-based value added. Besides, Weidenfeld (2018) suggests that tourism diversification promotes the development of value-added services and contributes to protecting natural resources by preventing the risk of resource depletion in specific tourism activities. Thus, it ensures the sustainability of tourism activities in each market.

Although tourism market diversification is generally known for its benefits to the national economies, it may not create expected advantages under all circumstances. Hoskisson and Hitt (1990) emphasized that tourism diversification is not an easy task for practitioners, and diversification and performance nexus are complicated processes. In this regard, determining target tourism markets for diversifying tourism markets could be costly; hence, a biased diversification strategy can waste limited resources. Besides, the success of the diversification depends on the circumstances at the time the decision is made. For instance, tourism market diversification may not produce the desired outcomes amidst turmoil such as the COVID-19 outbreak (Yap et al., 2022). Lastly, achieving long-term results with diversifying markets in the tourism may be challenging because the nature of consumer demand can profoundly shift as long as welfare levels and consumer behaviors change (Yasar et al., 2022).

Australia is one of the major tourist attractions, ranking 58th among countries with the most tourists in 2020. Tourism activities account for nearly $33.3 billion in Australia's GDP and 10% of total exports in recent years (Main, 2022; World Bank, 2023). Thus, the tourism provides thousands of jobs and is an integral part of the Australian economy; therefore, diversifying the number of tourism markets, arrivals, and revenues is critical to the Australian economy. Raising the competitiveness of Australian tourism activities by understanding the drivers of tourism diversification could be the driving force of Australian economic development amidst the uneven economic recovery process of the global economy in the post-pandemic period.

Although researchers have focused on various dimensions of Australian tourism diversification, such as tourism market diversification and environmental sustainability (Peng et al., 2023), tourism diversification and economic growth (Solarin et al., 2023), innovation capacity of Australian tourism destinations (Schmallegger et al., 2011); surprisingly, researchers have not addressed uncovering determinants of Australian tourism market diversification. This exposes the existing research gap in the literature. To this end, the primary objective of this research is to investigate the determinants of tourism diversification in Australia from 1987 to 2021. In this regard, this paper estimates the tourism diversification index for different markets and tourism purposes based on the work of Can and Gozgor (2018) to examine the determinants of tourism diversification. To the best of our knowledge, no work has examined the determinants of tourism diversification dynamics by constructing a diversification index for different markets and tourism purposes. Uncovering what drives Australian tourism diversification can contribute to the existing literature in the following ways. First, understanding Australia's tourism diversification determinants can provide key evidence for policymakers to plan future tourism strategies effectively. Second, understanding Australian tourism diversification can strengthen Australia's tourism activity recovery in the post-pandemic period and provide key inferences for setting market/activity-based tourism policies. Third, using a combination of cointegration tests and different estimators can help researchers check the robustness of the empirical estimations and accurately determine the long-run drivers of market diversification of Australian tourism.

Literature review

The tourism-economy nexus is a contemporary topic for economists, and there is considerable empirical literature on the subject. The characteristics of the literature to date can be examined by dividing the existing work into two main strands. The first strand of research sought to answer the nexus between tourism and economic growth (see Lee and Brahmasrene, 2013; Paramati et al., 2017; Balsalobre-Lorente et al., 2021; Solarin et al., 2024). Much of the research demonstrates that an increase in tourism activities and revenues either promotes or has a causal impact on economic growth. The second strand of research focused on identifying the determinants of tourism demand. In this regard, the second group of papers can be divided into several sub-groups. The first group of works examines the impact of income on tourism (see Loeb, 1982; Lim et al., 2008; Husein and Kara, 2020; Permatasari et al., 2020; Bayrakcı and Ozcan, 2023). It can be said that there is a consensus among researchers about the positive effect of income on tourism.

The second group of researchers questions the role of relative prices or prices on tourism (see Uysal and Crompton, 1985; Akış, 1998; Durbarry and Sinclair, 2003; Seetanah et al., 2010). The empirical results show that relative price level changes and price competitiveness are essential determinants of tourism. The third group of papers focuses on uncovering the impact of exchange rates on tourism (see Tang et al., 2016; Shafiullah et al., 2019; Ulucak et al., 2020). Much empirical evidence proves that exchange rate changes and their volatility can drive tourism.

The fourth research group has focused on the role of infrastructure in tourism (see Seetanah et al., 2010; Seetenah, 2011; Li et al., 2015; Wamboye et al., 2020; Nguyen, 2021). Consequently, researchers have unveiled that infrastructure development can promote tourism in the countries concerned. The fifth group of research has emphasized the investigating impact of non-economic factors (i.e. democracy, freedom, geographical proximity, climate policy, information and communication technologies, political risk, terrorism risk, market structure, culture, etc.) on tourism (see Cho, 2010; Seetanah et al., 2010; Tavares and Leitao, 2017; Bulut et al., 2020; Shafiullah et al., 2019; Vanegas, 2020; Ağazade, 2023; Apergis et al., 2023; Yerdelen et al., 2020; Ghosh, 2022; Noonan, 2022). Researchers have reported that non-economic factors can also determine tourism activities in this context.

Despite their importance for the sustainability of tourism revenues, researchers have paid less attention to tourism diversification. As far as we know, surprisingly, few studies on the concept have concentrated on the consequences of tourism diversification. For instance, Can and Gozgor (2018) develop a new tourism diversification index and examine the economic growth and tourism diversification index by applying the panel Granger causality method from 1995 to 2014. They report bidirectional causality between economic growth and market diversification in Italy, Spain, and Tunisia. Saboori et al. (2022) investigate the economic impact of tourism market diversification in 109 countries from 1995 to 2018. The results show that diversification of tourism markets has a more positive effect in nations with lower levels of economic growth. Yap et al. (2022) showed that diversifying tourism markets positively affects tourism arrival growth in Qatar.

In contrast to the existing literature, this paper constructs a tourism diversification index that considers submarkets and the purposes of tourism for the Australian economy and examines the determinants of tourism diversification in Australia within an augmented tourism demand model. In this regard, this paper aims to help fill the existing literature gap and combine unique contributions.

Model, data, methodology, and empirical results

Theoretical framework

According to the standard tourism demand model, the income of visitors is a significant determinant of tourism arrivals (Husein and Kara, 2020; Kocak et al., 2023). In the same vein, increases in the income of new source (or underdeveloped) markets will raise the average income of all visitors to a host country if there is an increase in arrivals from the new source (or underdeveloped) markets. In such cases, tourism diversification efforts will be successful. In many hosts (that are developed) nations (including Australia), countries with higher income (especially the developed countries) tend to dominate the tourism arrivals (Saboori et al., 2022). However, in recent years, statistics have shown that countries with lower income (especially developing countries) have experienced faster income growth than countries with higher income (especially developed countries) (World Bank, 2023). Additional visitors are likely to engage in new tourism activities (McKercher, 2002), thereby diversifying tourism activities. These scenarios imply that an increase in the average income of visitors is associated with tourism diversification.

Another significant variable recognized in the standard tourism demand model is the relative prices and cost of travel (Dogru et al., 2017; Husein and Kara, 2020). Cost and distance of travel barriers are among the several factors contributing to hindrances from moving from the origin country to the destination country. One of the reasons is that most of the new markets in a destination country are likely to be the more dominant markets in other destinations than the developed markets in the destination country under consideration (Smeral and Witt, 2002). Hence, an increase in the cost of travel to a particular destination will likely have more impact on visitors from new source markets. An increase in the cost of travel might also have a more significant negative impact on new or undeveloped markets as tourists from these countries might not have adequate information on cheaper tourism packages in a particular destination, unlike visitors from established markets that have been frequenting a particular country. Many tourism packages are designed to financially incentivize repeat tourism in many destination countries (Vada et al., 2023). An increase in the cost of tourism tends to have a more significant financial impact on tourists from new markets, thereby leading to tourism market concentration that is against tourism market diversification. As additional visitors from the new markets are likely to engage in new tourism activities (McKercher, 2002), the cost of travel will harm the diversification of tourism activities.

To augment the main variables of the standard tourism demand framework, we have also included infrastructural facilities in the model. Infrastructural facilities development influences both tourism arrivals and tourism market diversification. Infrastructural facilities, including accommodation, transportation, and institutional support, are often more visible in destinations with excellent tourism arrivals (Kanwal et al., 2020). Some tourism infrastructure facilities specifically aim to attract visitors from new source markets to mitigate the seasonality problems in the destination countries' tourism activities (Sharpley, 2002). These include investment in tourism sites that are culturally affiliated with visitors from underdeveloped markets (Lahura and Cabrera, 2023). Hence, increasing such infrastructural facilities is expected to improve tourism market diversification. Additional facilities also imply new capacities for additional tourism activities (Bond et al., 2015), diversifying tourism activities.

Another variable that can be used to augment the standard tourism demand framework is political risk. Internal conflict, religious tensions, lack of law and order, and ethnic tensions are some variables associated with political risks. Their presence dampens destinations' ability to attract visitors, especially from new markets (Lee and Chen, 2021). An increase in unfavorable political events within a country is associated with heightening political risk in such a country. It might reduce the number of tourist markets that account for many tourists. This is because rising political risk within a country implies a smaller number of nations that the destination country is better than in terms of political risk. Hence, visitors from only a few countries will likely choose such destination countries for tourism activities (Lee and Chen, 2021). Moreover, a destination country experiencing political tensions with an increasing number of nations indicates a heightened political risk. The higher the number of countries the destination country has political tensions with, the less likely the number of countries from which such country will likely generate substantial tourists. One example is Russia, where political sanctions from Australia, Canada, the European Union, and the United States have adversely affected tourist arrivals from these countries (Yap et al., 2022). The preceding analysis suggests that heightening political risk decreases tourism market diversification. As tourists from the new markets likely engage in new tourism activities (McKercher, 2002), political risk will harm the diversification of tourism activities.

Model and data

Premised on the developed theoretical framework, the following general linear-log model is employed to investigate the determinants of tourism diversification:

$$lnTD_t = \beta_0 + \beta_1 lnGDP_t + \beta_2 \ln P_t + \beta_3 lnI_t + \beta_4 lnPOL_t + \epsilon_t \quad (1)$$

In equation (1), *GDP* shows the average income or average gross domestic product per capita of source countries (GDP) (constant, 2015 US$), *p* tourist price is calculated as price level in Australia/average price level in source countries. *I* represent infrastructural facilities or the per capita value of major engineering construction work done in Australia (constant, 2015 US$), and *POL* denotes Australia's political risk rating. The *GDP* is used as a proxy for measuring the welfare level of source countries, and tourist prices are used as a proxy for measuring comparative living costs; *POL* is the political risk rating of Australia and is used as a proxy for measuring the strength of Australian institutions. The political risk rating consists of 12 sub-components, primarily associated with political stability in a country, and it varies between 0 (highest level of political risk) and 100 (minimum level of political risk). Besides, *I* is used as an infrastructure investment proxy for Australia. The *GDP* and *p* data were retrieved from the World Bank (2023), while the I and *POL* data were retrieved from the Australian Bureau of Statistics (2023) and PRS Group (2023), respectively. Last, *TD,* which shows the tourism diversification index (TDI), and tourism diversification index components was retrieved from the Australian Bureau of Statistics (2023). Can and Ozgur (2018) developed a TDI based on an export diversification index proposed by Herfindahl-Hirschman, using tourist arrivals instead of exports as equation (2):

$$\sum\nolimits_{j=1}^{ni} \left(\frac{v_{ij}}{V_i}\right)^2 - \frac{1}{p_i} \Big/ 1 - \frac{1}{p_i} \quad (2)$$

Where V denotes the number of tourists to country i, v shows the number of tourists who arrived from country j to country i, and p is the number of partner countries. The index values vary between 0 (maximum level of diversification) and 1 (minimum level of diversification). A high index indicates that Australia receives tourists from very few source countries for certain activities, while a low index value shows that Australian tourism is fully diversified.

Using the strategy of Can and Ozgur (2018), we estimated six different TDIs for Australia. First, we estimated an overall TDI for all tourists from 46 different markets; see Table 1 for a list of countries. In addition, we estimated the TDI for tourists from different markets, shown in Table 1.

These markets were included because they produced at least one visitor to Australia in each year of the period studied. We also created a TDI based on the purpose of visitation for all tourists. In this way, we employed six models, the details of which are shown in Table 2.

Descriptive statistics of the data used are shown in Table 3. Oceania (TD5) has the highest mean value in TDI, while the TDI of all markets (TD1) has a lower mean value. The maximum value of TD is -0.194 and belongs to Oceania, while the minimum value of TD is -2.937 and belongs to all markets. Europe has the highest average income (GDP4), while Oceania (GDP5) has the lowest average income. The relative price level data shows that Oceania (P5) has the highest tourist price, while Europe (P4) has the lowest.

Methodology and empirical results

This study adopts the methodological steps shown in Figure 1 to uncover Australia's tourism diversification determinants. First, this work uses Augmented Dickey-Fuller (ADF) (Dickey and Fuller, 1981), DF-GLS (Elliot et al., 1996), and Phillips and Perron (1988) (PP) unit root tests to check the integration level of the variables. The second step is determining the optimal lag length for

Table 1. List of countries/territories and purposes of tourists included in the estimation of specific TDIs.

Markets				Purpose
America	Asia	Europe	Oceania	
1. Argentina	1. Bangladesh	1. Austria	1. Fiji	Business, conventions, Conferences, education, holiday/Vacation, visit, friends/Relatives, and others (not stated)
2. Brazil	2. China	2. Belgium	2. New Caledonia	
3. Canada	3. Hong Kong (SAR)	3. Denmark	3. New Zealand	
4. Chile	4. India	4. Finland	4. Papua New Guinea	
5. Colombia	5. Indonesia	5. France	5. Vanuatu	
6. Mexico				
7. USA	6. Iran	6. Germany		
	7. Israel	7. Ireland		
	8. Japan	8. Italy		
	9. Korea South	9. Netherlands		
	10. Malaysia	10. Norway		
	11. Nepal	11. Poland		
	12. Pakistan	12. Spain		
	13. Philippines	13. Sweden		
	14. Saudi Arabia	14. Switzerland		
	15. Singapore	15. United Kingdom		
	16. Sri Lanka			
	17. Thailand			
	18. United Arab Emirates			
	19. Vietnam			

Table 2. Model definitions and details.

Source of TDI	Model	Details
All markets	Model 1	$lnTD1_t = \beta_0 + \beta_1 lnGDP1_t + \beta_2 \ln P1_t + \beta_3 lnI_t + \beta_4 lnPOL_t + \epsilon_{1t}$
America	Model 2	$lnTD2_t = \beta_0 + \beta_1 lnGDP2_t + \beta_2 \ln P2_t + \beta_3 lnI_t + \beta_4 lnPOL_t + \epsilon_{2t}$
Asia	Model 3	$lnTD3_t = \beta_0 + \beta_1 lnGDP3_t + \beta_2 \ln P3_t + \beta_3 lnI_t + \beta_4 lnPOL_t + \epsilon_{3t}$
Europe	Model 4	$lnTD4_t = \beta_0 + \beta_1 lnGDP4_t + \beta_2 \ln P4_t + \beta_3 lnI_t + \beta_4 lnPOL_t + \epsilon_{4t}$
Oceania	Model 5	$lnTD5_t = \beta_0 + \beta_1 lnGDP5_t + \beta_2 \ln P5_t + \beta_3 lnI_t + \beta_4 lnPOL_t + \epsilon_{5t}$
All visitors by their purpose	Model 6	$lnTD6_t = \beta_0 + \beta_1 lnGDP6_t + \beta_2 \ln P6_t + \beta_3 lnI_t + \beta_4 lnPOL_t + \epsilon_{6t}$

the cointegration test. For this purpose, the standard vector autoregressive model is estimated, and the optimal lag lengths are determined using the information criterion as a preliminary analysis.

The third step of the methodological framework is to check whether there is cointegration between the variables in each model. To this end, this paper conducts a combined cointegration test,

Table 3. Descriptive statistics.

Variable	Mean	Median	Max	Min	Std. Dev
GDP1	9.836	9.886	10.370	9.062	0.395
GDP2	9.594	9.548	10.109	8.831	0.396
GDP3	9.284	9.227	9.881	8.436	0.414
GDP4	10.440	10.549	10.950	9.692	0.389
GDP5	9.268	9.317	9.844	8.497	0.444
GDP6	9.836	9.886	10.370	9.062	0.395
P1	-0.036	-0.016	0.206	-0.247	0.119
P2	0.002	0.043	0.188	-0.325	0.137
P3	0.014	0.017	0.236	-0.223	0.123
P4	-0.117	-0.163	0.201	-0.336	0.148
P5	0.016	0.017	0.226	-0.169	0.089
P6	-0.036	-0.016	0.206	-0.247	0.119
I	1.021	0.864	1.987	0.343	0.402
POL	4.428	4.431	4.487	4.323	0.044
TD1	-2.527	-2.572	-1.686	-2.937	0.250
TD2	-0.606	-0.556	-0.389	-0.871	0.141
TD3	-1.968	-2.060	-1.035	-2.709	0.511
TD4	-1.408	-1.413	-1.177	-1.632	0.120
TD5	-0.298	-0.279	-0.194	-0.415	0.055
TD6	-1.465	-1.487	-1.065	-1.775	0.214

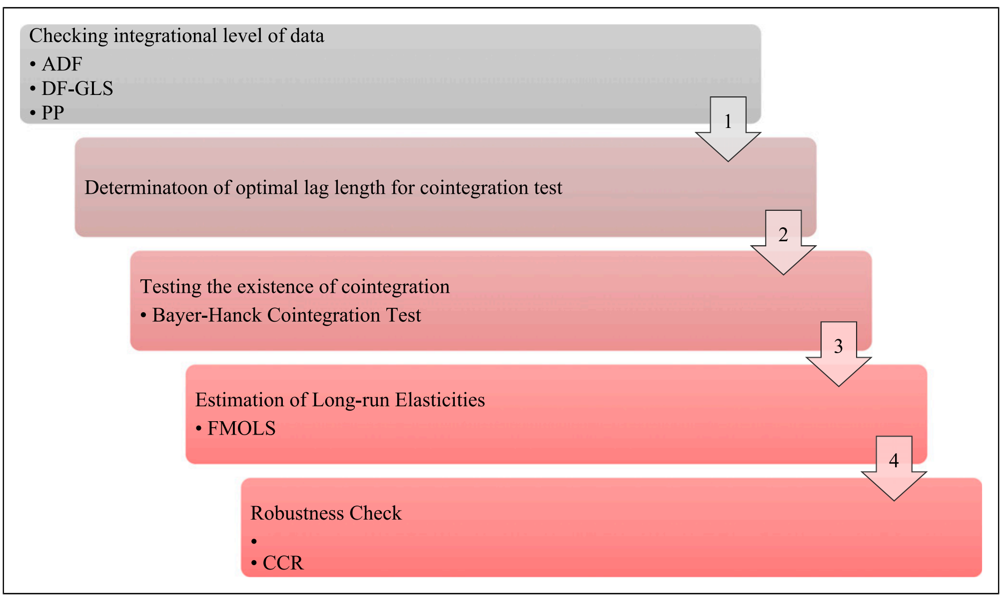

Figure 1. Methodological framework of the study.

namely the Bayer-Hanck (BH) test proposed by Bayer and Hanck (2013). The traditional co-integration literature uses residual-, system-, and error correction-based test procedures. The empirical outcomes of those methods can frequently be controversial, and determining whether cointegration exists in the estimated model(s) can be arduous. The BH method can prevent arbitrary decisions in case of conflict among individual test results and reduce the size distortion risk of applying multiple cointegration tests in the same model. Besides, it has a substantial power property compared to the traditional cointegration methods. BH cointegration method combines four different cointegration methods proposed by Engle and Granger (1987), Johansen (1988), Boswijk (1994), and Banerjee et al. (1998) in a Fisher-type testing strategy. For doing this, let S_i be the estimated test statistic of the test i. Let's assume $\tilde{\gamma}_i = S_i(-\tilde{\gamma}_i = S_i)$, if test i rejects for large (small) values. To have a joint decision from the various γ_i, one needs an aggregator. In this regard, the BH method utilizes a fisher-type aggregator that can be shown as follows:

$$\check{X}_x^2 = -2\sum_{i \in X} \ln(p_i) \tag{3}$$

Besides, the BH method might provide a more robust result by testing the null hypothesis of no cointegration. It can be derived that if the estimated EG-J and EG-J-BO-BDM statistics are above the critical values, the variables are cointegrated, which requires estimating their long-run relationships.

The fourth stage of the empirical framework consists of estimating the long-run elasticities of variables that exhibit a cointegration nexus using the fully modified ordinary least squares or FMOLS approach of Phillips and Hansen (1990). The FMOLS method solves spurious regression problems in traditional OLS when variables follow the I(1) process. Besides, the FMOLS method can produce robust test statistics for serial correlation and heteroscedasticity, address specific forms of endogeneity, and have a satisfactory finite sample performance. Therefore, it allows researchers to obtain robust empirical estimations. The estimation strategy of the FMOLS estimation can be uncovered as follows (Khan, 2024):

$$\widehat{\delta}_{FMOLS} = \left(\sum\nolimits_{t=1}^{T} X_t X_t'\right)^{-1} \left(\sum\nolimits_{t=1}^{T} X_t Z_t^+ - T\widehat{j}^+\right) \tag{4}$$

Where $Z_t^+ = z_t - \widehat{\theta}_{0x}\widehat{\theta}_{xx}^{-1}\Delta x_t$ denotes the correction term for endogeneity, $\widehat{\theta}_{0x}$ and $\widehat{\theta}_{xx}^{-1}\Delta x_t$ represents Kernel estimates of the long-run covariances $\widehat{J} = \widehat{\Delta}_{0x} - \widehat{\theta}_{0x}\widehat{\theta}^{-1}\widehat{\Delta}_{0x}\, xx\widehat{\Delta}_{xx}$ is the correction term for serial correlation, $\widehat{\Delta}_{0x}$ and $\widehat{\Delta}_{xx}$ are Kernel estimates of the one-sided long-run covariances. Last, to check the robustness of the results of the FMOLS method, the canonical cointegration regression (CCR) estimation method of Park (1992) is used in the final step.

Most of the unit root test results reported in Table 4 show that all variables have a unit root process at the level in the model with constant and trend. At the same time, they follow the stationary process at the first difference (I(1)) at different significance levels, except for TDI for all markets (TD1) and Oceania (TD5). The ADF and PP-unit, root test results, show that TD1 follows the I(1) process, while the DF-GLS test shows that the first-differenced TD1 does not become stationary. Besides, the ADF and PP -unit root test results show that TD5 follows the unit root process, while the DF-GLS -test results show that TD5 follows the stationarity process at a 10% significance level. Considering the majority of the empirical results, it can be inferred that TD5 follows the unit root process while it follows the stationarity process at the first difference. Most empirical results show that all variables follow the unit root process (I(1)). Therefore, the long-run relationship between the variables can be investigated using the BH cointegration test. The optimal lag lengths for the BH test are determined by estimating the standard VAR method and using the information criteria of Akaike and Hannan-Quinn.[1]

After determining the optimal lags, the combined cointegration method of BH is applied, and the empirical results are shown in Table 5. The empirical results show that the estimated EG-J and EG-J-BO-BDM statistics for models 1, 2, 3, and five are higher than the critical values. Therefore, the null hypothesis of "no cointegration" is rejected, and there is long-run co-movement among the variables in these four models. In contrast, the estimated EG-J and EG-J-BO-BDM statistics for models four

Table 4. Unit root results.

	ADF		DF-GLS		PP		
Variables	Level	First difference	Level	First difference	Level	First difference	Result
GDP1	-1.970	-4.746*	-1.855	-4.845*	-2.098	-4.652*	*I(1)*
GDP2	-1.738	-4.633*	-2.025	-4.696*	-1.864	-4.527*	*I(1)*
GDP3	-2.794	-4.844*	-2.454	-4.961*	-2.634	-4.751*	*I(1)*
GDP4	-1.938	-4.962*	-2.121	-5.092*	-2.051	-4.893*	*I(1)*
GDP5	-2.391	-4.647*	-2.497	-4.353*	-2.068	-4.685*	*I(1)*
GDP6	-2.183	-4.746*	-2.163	-4.845*	-2.098	-4.652*	*I(1)*
P1	-2.647	-4.325*	-2.664	-3.625**	-1.907	-4.815*	*I(1)*
P2	-2.744	-4.747*	-2.578	-4.543*	-1.949	-4.700*	*I(1)*
P3	-2.786	-4.009**	-2.878	-3.816*	-1.825	-3.823**	*I(1)*
P4	-2.217	-5.809*	-2.257	-5.469*	-2.217	-5.892*	*I(1)*
P5	-3.161	-3.809**	-2.836	-3.526**	-2.284	-3.678**	*I(1)*
P6	-1.907	-4.827*	-1.966	-4.433*	-1.907	-4.797*	*I(1)*
I	-2.158	-3.908**	-2.215	-4.021*	-1.452	-3.373***	*I(1)*
POL	-2.095	-5.114*	-1.437	-5.160*	-2.038	-6.315*	*I(1)*
TD1	-0.655	-3.810**	-1.480	-2.683	-1.197	-3.971**	*I(1)*
TD2	-0.981	-4.469*	-1.391	-3.564**	-1.650	-4.531*	*I(1)*
TD3	-1.656	-4.700*	-1.866	-3.926**	-1.952	-4.694*	*I(1)*
TD4	-2.039	-2.659***	-2.366	-2.294**	-1.713	-2.659***	*I(1)*
TD5	-2.855	-4.076**	-2.970***	-	-2.823	-6.616*	*I(1)*
TD6	-1.890	-4.817*	-2.004	-4.735*	-1.900	-4.721*	*I(1)*

Notes. *, **, and *** denote significance at the 1%, 5%, and 10% levels, respectively.

Table 5. Results of the BH cointegration test.

Test	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
EG-J	56.931*	56.576*	55.930*	6.622	55.866*	5.538
EG-J-BO-BDM	167.456*	111.838*	111.19*	8.267	111.128*	14.608
Critical values for EG-J						
1% CV=15.845		5% CV=10.576		10% CV=8.301		
Critical values for EG-J-BO-BDM						
1% CV=30.774		5% CV=20.143		10% CV=15.938		

Note. * indicates the rejection of no-cointegration at a 1% level.

and six are lower than the critical values. The null hypothesis of no cointegration cannot be rejected for models four and 6. Thus, there is no long-run relationship between the variables in models four and 6.

After examining cointegration, the long-term effects of the regressors on the dependent variables are investigated using the FMOLS approach. It should be reiterated that a low (high) level of TDIs refers to a high (low) level of tourism diversification. Thus, a negative (positive) and statistically significant impact of a given regressor implies an increasing (decreasing) impact on tourism diversification. Moreover, a high (low) level of the political risk index relates to a low (high) level of political risk. Thus, a negative (positive) and statistically significant effect of the political risk index means an increasing (decreasing) effect on tourism diversification.

According to the empirical results in panel A of Table 6, an increase in the average income in the source countries in Model 1 has a -0.314% effect on TDI, while this effect is -0.278% and -0.736% in Models 2 and 3, respectively. Moreover, average income does not have a statistically significant effect on TDI in model 5. Thus, an increase in average income promotes tourism diversification from all the source countries (Model 1), the American market (Model 2), and the Asian market (Model 3) in Australia. An increase in tourist price affects TDI one by 1.635% in Model 1, while this effect is -0.095% and -0.380% in Models 2 and 3, respectively. In model 5, however, tourist price has no statistically significant effect on TDI. Thus, it can be inferred that a relative price rise hinders tourism diversification from all the source countries (Model 1). At the same time, it promotes the diversification of tourism from the American market (Model 2) and the Asian market (Model 3) in Australia. An increase in infrastructure investment has a -0.458% effect on TDI in Model 1, while this effect is -0.036% and -0.255% in Models 2 and 3, respectively. However, in Model 5, infrastructure investment does not have a statistically significant effect on TDI. Therefore, an increase in infrastructure investment contributes to a greater diversification of tourism from the source countries (Model 1), the American market (Model 2), and the Asian market (Model 3). Finally, an increase in the political risk index (POL), which implies a decrease in political risks, affects TDI by -4.027% in Model 3 and 0.720% in Model 5. Moreover, the political risk index has no statistically significant effect on TDI in models one and 2. Thus, an increase in the political risk index promotes tourism diversification in the Asian market (Model 3) while it decreases tourism diversification in the Oceanian market (Model 5). As there is no evidence for a long-run relationship between the models involving the European market and tourism activities, we report the short-run results of the

Table 6. Regression output results.

	Panel A: FMOLS results				Panel B: OLS results		
Variable	Model 1	Model 2	Model 3	Model 5	Variable	Model 4	Model 6
GDP	-0.314**	-0.278*	-0.736*	0.040	ΔGDP	0.091	0.781**
P	1.635*	-0.095**	-0.380**	0.087	ΔP	0.096	0.643
I	-0.458*	-0.036**	-0.255*	-0.004	ΔI	-0.100	-0.228
POL	-0.741	0.067	-4.027*	0.720*	ΔPOL	-0.345	1.704***
C	4.372	1.800*	22.958*	-3.864*	C	0.002	-0.034
R^2	0.412	0.754	0.932	0.210	R^2	0.926	0.297

Note. See Table 4.

two models in Panel B of Table 6. The results show that an increase in the average income in the source countries decreases tourism diversification of tourism products in the short run.

The CCR method is used to check the robustness of the FMOLS estimates. According to the CCR estimation results in Table 7, average income, infrastructure investment, and the political risk index are comparable to the FMOLS estimates. For example, average income and infrastructure investment help to increase the diversification of tourism from all American and Asian markets. At the same time, they have no statistical effect on the diversification of tourism from Oceania. Moreover, an increase in the political risk index, that is, low political risk, promotes the increase of tourism diversification from the Asian market, while it has a negative effect on tourism diversification from Oceania. However, political risk has no statistically significant effect on tourism diversification from all and American markets.

The empirical results of the CCR estimates on the effect of relative price level on tourism diversification are like the FMOLS results for Model 1, Model 3, and Model 5. Thus, an increase in relative prices hinders tourism diversification from all markets while it promotes tourism diversification from Asian markets, and relative prices have no statistically significant effect on tourism diversification from Oceania. Interestingly, relative prices exhibit a negative and statistically non-significant effect on the CCR estimates for Model 2, while they have a negative and statistically significant effect on the FMOLS results. Thus, one could conclude that the empirical results of FMOLS and CCR are essentially in agreement.

Discussion

Empirical studies have shown that the average income of the source countries promotes the diversification of tourism in all, American and Asian markets. Loeb (1982) emphasized that the source country's per capita income significantly determines travel decisions. Therefore, a high income level can increase the purchasing power of individuals, which increases the number of foreign travelers. Lim et al. (2008) emphasized that economic prosperity affects individuals' travel demand. Therefore, an increase in the average income in the source markets can boost the tourism activities of individuals in those markets, which in turn helps Australia to receive more tourists from different markets. These results are consistent with theoretical expectations and partially consistent with the results of Can and Gozgor (2018).

Moreover, increasing relative price reduces tourism diversification from all source markets while increasing tourism diversification from Asian markets. One could say that -ceteris paribus-an increase in Australia's price level discourages tourists from traveling to Australia from various markets. Uysal and Crompton (1985) emphasized that when there is a relative price decrease, the

Table 7. Robustness check with CCR.

Variable	Model 1	Model 2	Model 3	Model 5
GDP	-0.350**	-0.292**	-0.754*	0.039
p	1.965*	-0.012	-0.539*	0.122
I	-0.520*	-0.058**	-0.198*	-0.003
POL	-0.393	0.259	-3.931*	0.720*
C	3.275	1.112	22.642*	-3.860*
R^2	0.419	0.859	0.930	0.665

Note. See Table 4.

number of travelers is expected to increase, and this may contribute to many more tourists coming from markets that benefit from the relative price change. Seetenah (2011) found that relative prices are one of the significant determinants of destination choice. In this context, tourists compare the cost of living in the host nation with that of the source country and decide to travel. Akış (1998) stated that relative prices are among the most critical determinants of international trade. As a particular form of international trade, a similar assumption can be made for tourism. Thus, if the price level of the host country decreases compared to the origin country, this will increase tourism flows.

An upsurge in relative prices reinforces the diversification of tourism from Asian markets. This could result from the substitution price effect of relative prices between competing destinations. The rise in the price level in a competing region is higher than the increase in the price level in Australia, which could make Australia a more desirable destination for tourists from Asian markets. Another factor for a positive impact of the price level on tourism diversification from Asian markets could be the geographical proximity to Australia and Asian markets. Other advantages of Asian markets, such as low travel costs, may offset the impact of price levels. Furthermore, some host countries could be complementary rather than substitutive, that is, they host many more tourists than the other cheaper destinations (Seetenah et al., 2011). Tourists from the Asian market might also consider Australian destinations because they are on the Oceanic continent. In this regard, an increase in the price level is not necessarily a reason to postpone their travel plans.

The estimates outlined that an increase in infrastructure investment would promote the diversification of Australian tourism. Nguyen (2021) stated that improved tourism infrastructure can be a critical factor in increasing the service capacity of tourism destinations, increasing the destination's popularity. An improvement of the tourism infrastructure of host countries can be a critical factor in increasing the service capacity of various tourism themes, which contributes to the diversification of tourism activities. Seetenah et al. (2011) found that the quality of the host country's infrastructure is an essential component of the quality of reception. Their outcomes imply that a robust infrastructure can help meet tourists' expectations and increase satisfaction with tourism activities, increasing tourist destinations' popularity. Thus, the corresponding tourism market can attract more tourists from various countries. Li et al. (2015) pointed out that a well-developed infrastructure in a host country could improve accessibility, reduce travel costs for tourists, and increase popularity among tourists. In this way, an upsurge in large-scale technical activities and improving Australia's infrastructure can help increase tourism diversification, which will help Australia receive more tourists from different markets.

Finally, reducing political risk helps policymakers diversify tourism in Asian markets. Ghalia et al. (2019) unveiled that the existence of inefficient institutions, the prevalence of internal and external conflicts, poor governance, and the possibility of a military coup can reduce the popularity of the target destinations. Therefore, avoiding political risks can help countries improve tourism diversification from different markets. Balli et al. (2019) noted that information about the risk of domestic or regional conflict can quickly spread in the information and communication era, influencing individuals' travel decisions. Conversely, information about low political risk could enable the host country to attract more tourists from different markets. Xu et al. (2022) noted that tourism is a fragile economic activity highly affected by uncertainties. For example, the Syrian conflict and the Russian invasion of Ukraine have confirmed the vulnerability of tourism activities to political risks. In this regard, a decrease (rise) in political risks can increase (reduce) the tourism performance of a market, which in turn promotes tourism diversification.

Decreased political risk fosters tourist arrivals from the specific market(s) located in Oceania to Australia. As is well known, Oceania includes countries or territories with high levels of democracy and welfare and a low political risk profile, such as New Zealand and New Caledonia, while it also includes countries with low levels of democracy and welfare and a high political risk profile, such as Fiji and Papua New Guinea (Democracy Matrix, 2023; World Bank, 2023). Linder (1961) theorized in the Similarity of Preferences Theory that countries export goods that are in high demand in their domestic markets and are also preferred by other countries with similar preferences. Therefore, individuals from countries with high democracy and welfare and low political risk experience may choose to visit destinations with similar conditions. Thus, Australia, which has high levels of democracy, welfare, and low political risk, may attract visitors from countries with similar conditions and sell tourism products to countries with similar preferences. More than 90% of Oceanic visitors to Australia during the period studied came from countries with relatively high incomes and high levels of democracy, such as New Zealand and New Caledonia. In other words, Australia exported its tourism services to countries with similar conditions. Thus, reducing political risk could lead Australian tourism to intensify its tourism exports to specific oceanic markets.

Conclusion

This study has attempted to complement the existing literature by examining the diversification factors of the tourism market and its purpose within the augmented tourism demand framework. It has used data from 46 tourism markets and seven tourism activities in Australia from 1987 to 2021. The main additions of this study to the literature are (a) the examination of the factors of diversification of the tourism market and purpose and (b) using an augmented tourism demand model to identify the factors of diversification of tourism. This study advances the literature on tourism diversification and contributes to studies on tourism demand in Australia. Understanding the determinants of diversification of the tourism market and its purpose is essential and relevant for operators in tourism. One of the three main objectives of the THRIVE 2030 Strategy Action Plan (the country's strategy for the sustainable growth of Australia's tourism) is the tourism diversification. Among the targets of the Action Plan is for visitor expenditure to become $166 billion by 2024 and $230 billion in 2030. Reaching such targets depends on the country's ability to attract visitors from different markets, especially the currently less important ones.

The results indicate that a rise in average income in the source countries promotes tourism diversification from all the source countries, the American market and the Asian market in Australia. The results further suggest that an increase in relative price hinders the diversification of tourism from all the source countries while it promotes the diversification of tourism from the American market and the Asian market in Australia. An increase in infrastructure investment contributes to a greater diversification of tourism from all the source countries, the American market, and the Asian market. An increase in political risk is associated with tourism market diversification, especially in the Asian market and the Oceanian market. Lastly, there is no long-run relationship between the independent variables and the diversification of tourism activities.

The foregoing results have several implications for diversifying tourism markets and activities. One is the need to focus more tremendous marketing efforts on countries with higher per capita income. Efforts in marketing tourism should be aimed at developed countries as they have high levels of income and emerging economies since they experience more remarkable income growth. More visitors from countries with higher per capita income might lead to a more significant tourism expenditure per visitor in Australia. Realizing more expenditure per visitor will also ensure that the country can achieve one of the objectives of the THRIVE 2030 Strategy Action Plan. In case of possible future expansion of the present (15) core tourism markets in Australia (which currently include New Zealand, the U.S., Canada, China, Hong Kong, United Kingdom, Germany, France, Italy, Japan, South Korea, Singapore, Malaysia, India, and Indonesia), the focus should be on developed countries as well as emerging Asian countries.

The results also suggest that the price level might hinder the diversification of tourism markets. Hence, there is a need to ensure that affordable tourism services are available and that the information on services is generally available to current and potential tourists. This information should include how to refuel at the cheapest petrol stations (as not all petrol stations offer the same price in the country), how to visit during outside peak periods, and free activities for travelers, including visiting museums, galleries, world-class hiking, and historical walking tours.

Another implication of the results is that improving tourism infrastructure, including transport infrastructure such as airports, seaports, roads, and rail stock in Australia, is germane to tourism market diversification. A sizeable share of future recovery and stimulus assistance (such as the COVID-19 pandemic $1 billion recovery and stimulus assistance) should be devoted to uplifting tourism infrastructure. There are current efforts to improve tourism infrastructure in Australia, including the rolling out of the Building Better Regions Fund and Regional Recovery Partnerships Program, which aim to improve tourism infrastructure in regional areas of Australia.

The evidence that, in most cases, political risks do not have a significant impact on tourism market diversification in Australia can be attributed to the minimal political risks Australia faces. The country is known to be a multicultural liberal nation with high accountability, political stability, rule of law, and controlling corruption. Internal strife or tension and violence are rare in the country, and such scenarios are conducive to high business confidence and more tourism arrivals from different destinations, thereby enhancing tourism market diversification. Hence, efforts should be made to maintain minimal political risks, as one of the consequences is the continued diversification of the tourism market. The few cases in which political risks are associated with tourism diversification involve the Asian markets. The political risks measure used in this paper includes external conflict and tensions. Hence, there is a need to de-escalate any tension between Australia and any Asian country, especially China.

The absence of a long-run relationship between the independent variables and tourism products implies a need to consider other factors that can enhance the diversification of tourism products beyond the variables considered in this paper. Possible variables include an increase in the quality of tourism products, promotion of the products, image of the destination, and seasonality factor. Besides, the tourism authorities can also study how other more successful tourism destinations have achieved a formidable diversification of tourism products.

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Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author.

Note

1. The optimal lag lengths can be provided upon request.

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