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TOURISM, GROWTH, AND INCLUSION IN THE WORLD'S LEADING MUSLIM-FRIENDLY DESTINATIONS

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Abstract: This study examines whether Muslim-friendly tourism is associated with economic growth and whether growth is linked to unemployment and income inequality across the 20 leading destinations in the Global Muslim Travel Index 2024. The study further explores the indicative role of economic growth as a transmission channel linking tourism performance with socio-economic outcomes. Annual panel data spanning 2010–2024 are analyzed using the Panel Pooled Mean Group Autoregressive Distributed Lag approach to estimate both short-run and long-run relationships among the variables. Additional mediation analysis is conducted to examine the indirect role of economic growth in linking Muslim-friendly tourism with unemployment and income inequality. The findings reveal that Muslim-friendly tourism exhibits a significant positive long-run association with economic growth (θ = 0.5829). Tourism expansion is also negatively associated with unemployment (θ = -0.4273) and income inequality (θ = -0.2154), indicating inclusive development linkages. Economic growth further shows a negative relationship with unemployment (θ = -0.3064) and income inequality (θ = -0.2149), suggesting that growth functions as a transmission channel through which tourism development is linked to socio-economic welfare. In the short run, tourism expansion is positively associated with economic growth, whereas inflation tends to intensify inequality pressures. In addition, foreign direct investment appears to support productive capacity and inclusive economic expansion across Muslim-friendly tourism destinations. The findings suggest that Muslim-friendly tourism is closely associated with inclusive and sustainable development. Tourism expansion, when accompanied by macroeconomic stability and supportive investment conditions, is linked to better employment conditions, lower income concentration, and stronger long-term economic inclusiveness across leading Muslim-friendly tourism destinations.

Keywords: Muslim-friendly tourism, economic growth, unemployment, income inequality, PMG-ARDL

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INTRODUCTION

Tourism now occupies a central position in the global economy through its contribution to output, employment, mobility, and destination development. The World Travel & Tourism Council (WTTC, 2025) estimated that travel and tourism contributed about USD 10.9 trillion in 2024, equivalent to approximately 10 percent of global GDP, while supporting 356.6 million jobs or around 10.6 percent of global employment. With projected contributions of USD 11.7 trillion and nearly 371 million jobs in 2025, tourism increasingly functions as a major economic and labor-absorbing system rather than a peripheral service activity. From a tourism geography perspective, tourism is also a place-based development process. Its contribution depends on how destinations organize accessibility, infrastructure, services, cultural compatibility, institutional support, and territorial planning. Therefore, the economic and inclusive development implications of tourism need to be understood not only through aggregate expenditure, but also through the capacity of destinations to transform tourism activity into broader socio-economic outcomes. Within this expanding global tourism system, Muslim-friendly tourism has emerged as an increasingly important and resilient tourism segment. Muslim-friendly tourism refers to tourism services, infrastructure, and destination management practices designed to accommodate the religious requirements, lifestyle preferences, and travel expectations of Muslim travellers. These include, among others, halal food availability, prayer facilities, family-oriented environments, cultural sensitivity, safety, accessibility, and supportive tourism services. In this study, the term Muslim-friendly tourism is used consistently to reflect a broad destination-readiness framework. It is not used interchangeably with Islamic tourism or narrowly defined halal tourism, because Muslim-friendly tourism extends beyond religious travel and halal-certified products to include the overall capacity of a destination to serve Muslim travellers in an inclusive and competitive manner.

The Global Muslim Travel Index (GMTI, 2024) reports a strong recovery in international Muslim travel following the pandemic, with total expenditures projected to exceed USD 225 billion in the medium term. Leading Muslim-friendly destinations have also shown considerable continuity over time, with several countries maintaining strong positions despite

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minor year-to-year ranking changes. This development is supported by the demographic expansion of the global Muslim population, rising disposable income in major source markets, and increasing demand for destinations that provide halal-certified services, accessible tourism facilities, inclusive infrastructure, and supportive policy environments.

The GMTI (2024) identifies twenty destinations currently recognized among the world's leading Muslim-friendly tourism markets, including Indonesia, Malaysia, Saudi Arabia, Türkiye, the United Arab Emirates, and Qatar. Although the empirical period covers 2010–2024, the 2024 edition is used as a contemporary reference point to identify destinations with strong structural relevance to the Muslim-friendly tourism market, rather than as a strict retrospective ranking criterion for each year in the sample. The sampled destinations are therefore understood not simply as countries occupying a single-year ranking position, but as tourism markets with sustained destination positioning, halal-related service provision, tourism infrastructure, policy orientation, and visibility in the Muslim travel segment. In many of these countries, Muslim-friendly tourism has been integrated into national tourism and development strategies through infrastructure investment, destination branding, foreign capital inflows, exchange rate management, and employment-oriented tourism policies.

A key issue in framing this study is the difference between Muslim-friendly tourism as a destination concept and tourism expenditure as a measurable aggregate indicator. Muslim-friendly tourism refers to the preparedness of a destination to serve Muslim travelers through appropriate services, halal-related facilities, prayer spaces, safety, accessibility, cultural sensitivity, and supportive destination management. This understanding follows the logic of the Global Muslim Travel Index, which assesses destinations through access, communication, environment, and service dimensions (Mastercard & CrescentRating, 2024). Related studies also show that halal and Muslim-friendly tourism are broader than religious travel because they involve infrastructure, certification, local economic participation, cultural preservation, financial inclusion, and community empowerment (Qoir, 2024; Heembo & Nuyeam, 2024; Bamiro et al., 2025; Singgalen, 2025). The main empirical challenge is that Muslim-specific tourism expenditure is not reported consistently across countries and years. More direct indicators, such as Muslim tourist arrivals, Muslim tourist expenditure, GMTI scores, halal infrastructure indices, or composite destination-readiness measures, would be preferable. However, these data are not available in a consistent long-term panel for the world's leading Muslim-friendly destinations. Therefore, this study uses total tourism expenditure as a destination-level proxy for tourism performance in countries identified by the GMTI as leading Muslim-friendly destinations. This choice should not be read as equating total tourism expenditure with Muslim-specific spending. Rather, it uses aggregate tourism expenditure to capture the overall tourism performance of destinations where Muslim-friendly tourism is part of destination positioning, service systems, policy orientation, and tourism competitiveness. Similar aggregate tourism indicators are widely used in tourism-led development studies when segment-specific data are unavailable or incomplete (Alcalá-Ordóñez & Segarra, 2025; Bhatt et al., 2024; Nguyen et al., 2025; Subramaniam et al., 2022). Accordingly, the analysis examines tourism, growth, and inclusion in leading Muslim-friendly destinations, not expenditure made exclusively by Muslim tourists. This clarification helps align the theoretical framing, measurement strategy, and empirical interpretation of the study.

Despite the rapid expansion of Muslim-friendly tourism, its broader macroeconomic and inclusive development implications remain insufficiently explored. Tourism activity is widely associated with output expansion, foreign exchange earnings, and increased investment flows (Matthew et al., 2021; Sokhanvar & Jenkins, 2022). However, economic growth does not automatically lead to stronger labor market outcomes or a more equitable income distribution (Şenol & Onaran, 2023). Structural unemployment remains a major challenge in many economies (Mishra, 2024; Çakmak & Yigit, 2026), particularly in developing countries and tourism-dependent regions. At the same time, rising income inequality continues to be a critical global concern (World Bank, 2026). Evidence from the World Inequality Lab. (2026) shows that global income distribution remains highly concentrated, with the richest 10 percent capturing approximately 53 percent of total income, while the bottom 50 percent receive only around 8 percent. At the extreme upper end, the top 1 percent accounts for nearly one-fifth of global income. Wealth inequality is even more concentrated, as the top decile controls roughly three-quarters of global wealth, while the bottom half of the population owns only a very small share. These patterns raise an important question: whether tourism expansion, including tourism activity in Muslim-friendly destinations, is associated with inclusive development or whether its benefits remain concentrated among particular groups, sectors, or regions. In this study, inclusion is examined through two macro-level outcomes: unemployment and income inequality. The unemployment dimension reflects whether tourism-linked expansion is associated with labor absorption, while the inequality dimension reflects whether tourism-oriented growth is linked to a more balanced distribution of income or to greater income concentration.

A substantial body of empirical research has examined the relationships among tourism development, economic growth, employment creation, and income distribution. The tourism-led growth hypothesis has been widely tested (Odeleye et al., 2022; Alcalá-Ordóñez et al., 2024; Bhatt et al., 2024; Wu et al., 2025), and many studies report long-run relationships between tourism activity and economic growth across different country contexts (Naseem, 2021; Almeida, 2023; Sarkhanov & Baghirov, 2023; Karimi et al., 2024; Ansari, 2025). Recent studies further suggest that tourism expansion is linked to output performance through capital accumulation, sectoral reallocation, productivity improvements, and inter-sectoral linkages (Nugroho & Verikios, 2025; Alqaralleh et al., 2025; Alcalá-Ordóñez & Segarra, 2025). Beyond aggregate output, tourism may also influence employment through labor-intensive service activities, hospitality industries, transport services, retail networks, local supply chains, and small business development (Zhao et al., 2023; Nguyen et al., 2025; González & Surovtseva, 2025; Sokhanvar & Çiftçioğlu, 2022; Bolukoglu & Gozukucuk, 2024). These findings indicate that tourism may operate through multiple development channels, but they also suggest that the inclusiveness of tourism-related outcomes depends on destination characteristics, institutional capacity, labor market structures, and macroeconomic conditions. Nevertheless, the distributional consequences of tourism expansion remain theoretically and empirically contested.

Some studies find that tourism development contributes to reducing income inequality and narrowing regional income gaps when supported by strong institutional frameworks, infrastructure development, and broader local participation

(Subramaniam et al., 2022; Nguyen et al., 2021; Wang & Bai, 2023; Wang et al., 2025). In contrast, other studies argue that tourism growth may increase wage disparities when capital ownership, high-value tourism services, and tourism-related rents are concentrated within specific firms, regions, or income groups (Liodakis, 2019; Zhang, 2023; Šergo et al., 2024). Short-run tourism adjustments may also generate unfavorable distributional outcomes through price pressures, resource reallocation, and real exchange rate movements (Camacho & Ramos-Herrera, 2025; Kumail et al., 2023; Xuanming et al., 2026; Nugroho et al., 2025). These mixed findings show that tourism-induced growth does not necessarily translate into employment inclusion or more equitable income distribution. Therefore, the relationship between tourism, growth, and inclusion should be examined within an integrated framework that captures both direct tourism-related associations and indirect transmission through economic growth. Macroeconomic conditions are also important in shaping these transmission mechanisms. Exchange rate movements influence tourism competitiveness, travel affordability, and international tourism demand (Loganathan et al., 2019; Tung & Thang, 2022; Ding & Timmer, 2023), while exchange rate volatility and persistent inflation may weaken growth performance and disrupt labor market adjustments (Olamide et al., 2022; Oyadeyi et al., 2025; Alemu, 2025). Inflation affects macroeconomic stability and real purchasing power (Piergallini, 2022; Abaidoo & Agyapong, 2023) and may exert nonlinear effects on income inequality, with higher inflation tending to worsen income disparities (Moradizadeh et al., 2022). Monetary policy regimes such as inflation targeting may further influence income distribution (Altunbaş & Thornton, 2022). Foreign direct investment plays a dual role by promoting capital accumulation and productivity while also potentially influencing wage structures and income concentration (Emako et al., 2023; Saha, 2024). Although FDI can reduce unemployment and expand productive capacity under favorable structural conditions (Setiawan et al., 2025; Chtioui & Boushib, 2025), its employment effects are not uniform across countries (Ceyhan, 2025).

Moreover, the relationship between FDI and income inequality depends on country risk conditions and financial development levels (Wang & Lee, 2023; Lee et al., 2022). These interactions suggest that tourism development, macroeconomic stability, capital inflows, labor market outcomes, and income distribution should be analyzed jointly rather than as isolated relationships. Although the tourism-led growth literature has expanded considerably, several important research gaps remain. Existing studies often examine tourism and economic growth, tourism and employment, tourism and income inequality, or macroeconomic determinants such as exchange rates, inflation, and foreign direct investment separately.

Relatively few studies integrate these relationships within a unified analytical framework that captures their joint transmission mechanisms. In addition, many cross-country studies rely on broad global samples that combine countries with diverse institutional structures, tourism systems, development levels, and destination characteristics. Such heterogeneity may obscure how tourism performance is associated with labor market outcomes and income distribution within more specific destination groups. These gaps are particularly important from a destination development perspective because tourism outcomes are not only macroeconomic phenomena, but also reflect how places organize services, infrastructure, investment, accessibility, and institutional support. These limitations are especially relevant in the case of Muslim-friendly tourism.

Despite its rapid expansion and growing strategic importance, empirical research on its broader development implications remains limited. Most studies on Muslim-friendly tourism focus on market potential, tourist behavior, halal service standards, destination competitiveness, certification systems, or promotional strategies rather than on its association with growth and inclusion at the macro level. As a result, limited evidence exists on whether tourism performance in leading Muslim-friendly destinations is linked to inclusive economic outcomes such as lower unemployment and reduced income concentration.

More specifically, Muslim-friendly tourism has rarely been examined as a destination-based development model that connects tourism performance with economic growth, employment conditions, and income distribution within a single empirical framework. Unlike previous studies that tend to examine tourism-growth, tourism-employment, or tourism-inequality relationships separately, this study integrates tourism development, macroeconomic stability, and distributional outcomes in a unified framework focusing on the world's leading Muslim-friendly destinations. To address these gaps, this study contributes to the literature in three main ways. First, it focuses on the twenty leading Muslim-friendly destinations identified in the Global Muslim Travel Index 2024, allowing the analysis to concentrate on a strategically relevant group of tourism-oriented economies rather than a broad and highly heterogeneous global sample. This focus is important because these destinations represent places where Muslim-friendly tourism is embedded in destination positioning, service systems, tourism competitiveness, and development strategies. Second, the study examines tourism, growth, and inclusion within a unified framework by incorporating tourism expenditure, exchange rates, inflation, foreign direct investment, economic growth, unemployment, and income inequality. Third, the study employs the Panel Pooled Mean Group Autoregressive Distributed Lag (PMG-ARDL) approach, which allows short-run dynamics to vary across countries while estimating long-run equilibrium relationships. Through this framework, the study provides new evidence on how tourism performance and macroeconomic conditions are associated with growth and inclusion in the world's leading Muslim-friendly destinations.

LITERATURE REVIEW

Tourism-Led Growth and Macroeconomic Transmission

Tourism has been widely examined as an important factor linked to economic growth, structural transformation, and sectoral expansion. Within the tourism-led growth hypothesis and endogenous growth perspective, tourism activity is generally associated with economic performance through tourism expenditure, investment flows, productivity improvement, and international mobility. These channels may support domestic demand, encourage capital accumulation, generate multiplier effects, and strengthen inter-sectoral linkages. As summarised in Table 1, empirical studies across developed and developing economies provide broad support for the tourism-led growth perspective. Kaur & Kansra (2018), Dogru & Bulut (2018), Ighodaro & Adegboye (2020), Odeleye et al. (2022), Nugroho & Verikios (2025), and Alqaralleh et al. (2025) report positive relationships between tourism expansion and economic growth through investment, tourism

receipts, productivity gains, and output expansion. However, the tourism-growth nexus remains heterogeneous across countries and institutional contexts. Eyuboglu & Eyuboglu (2020) identify asymmetric tourism-growth relationships, suggesting that tourism shocks may be associated with different macroeconomic responses depending on structural and country-specific conditions. These mixed findings indicate that tourism-led growth is not automatic, but is shaped by macroeconomic stability, institutional quality, and complementary economic policies. Exchange rates, inflation, and foreign direct investment are therefore viewed as important macroeconomic conditions associated with tourism performance and growth transmission mechanisms. Table 1 synthesizes recent empirical studies on the relationships between tourism, economic growth, employment, and income distribution. The expressions used in the table follow the interpretations and conclusions reported by the respective authors. In contrast, the empirical findings of the present study are interpreted more cautiously as associations, linkages, and long-run equilibrium relationships rather than as definitive causal effects.

Table 1. Recent Empirical Evidence on Tourism

Author(s)	Method	Main Findings	Variable Focus
Kaur & Kansra (2018)	Co-integration and VECM	Tourism investment and export performance increase GDP and employment in both the short and long run through strong multiplier effects.	GDP, tourism investment, net exports, employment
Dogru & Bulut (2018)	The Dumitrescu and Hurlin panel causality test	Evidence supports the tourism-led growth hypothesis, showing that tourism expansion enhances economic output and strengthens sectoral linkages.	GDP, tourism
Eyuboglu & Eyuboglu (2020)	Panel causality test	No direct tourism-growth causality is detected, although asymmetric analysis reveals hidden tourism-led growth effects.	Tourism development and economic growth
Ighodaro & Adegboye (2020)	Autoregressive distri-buted lags (ARDL)	Tourism promotes long-run growth through services expansion and employment generation.	Tourism, growth, services sector, employment
Nguyen et al. (2021)	Panel econometrics (97 countries)	Domestic and international tourism reduce income inequality, particularly under stronger institutional quality.	Tourism, inequality, institutions
Sokhanvar & Çiftçioğlu (2022)	Toda-Yamamoto causality	Tourism sector expansion causally affects unemployment and growth, though effects differ across countries.	Tourism share, unemployment, GDP
Odeleye et al. (2022)	Panel causality	The tourism-led growth hypothesis is supported across 37 Asian economies, with varying effects across income groups.	GDP, tourism receipts
Subramaniam et al. (2022)	FMOLS and DOLS	Tourism acts as a major driver of income equality in high-income-equality countries.	Tourism, income inequality
Kumail et al. (2023)	Panel cointegration and causality	Tourism development exhibits a nonlinear inverted U-shaped relationship with income inequality, while tourism investment helps reduce inequality.	Tourism development, capital investment, inequality
Wang & Bai (2023)	FE, IV, 2SLS, GMM	Tourism narrows the urban–rural income gap, with rural infrastructure acting as a mediating mechanism.	Tourism, income gap, infrastructure
Bolukoglu & Gozukucuk (2024)	Panel Analysis (EU)	Tourism development improves gender employment, although spillover effects may constrain empowerment outcomes.	Tourism, employment, gender gap
Camacho & Ramos-Herrera (2025)	Panel ARDL–PMG	Tourism reduces inequality in developed countries in the long run but tends to increase inequality in developing economies, particularly in the short run.	Tourism, Gini index, inequality
Qoir (2024)	Mixed methods: Panel data regression	Tourist arrivals stimulate economic growth in OIC countries, while Muslim-friendly facilities and promotion strengthen halal tourism performance.	Tourist arrivals, halal tourism, economic growth
Heembo & Nuyeam (2024)	Mixed-methods approach	Halal tourism supports local growth through higher revenue, employment, infrastructure investment, and cultural preservation.	Halal tourism, tourism revenue, employment, infrastructure development
Nugroho & Verikios (2025)	Dynamic general equilibrium simulation	Tourism expansion promotes long-run growth through capital accumulation and productivity improvement, potentially surpassing traditional sectors.	Tourism, capital stock, productivity, GDP
Alqaralleh et al. (2025)	Panel Quantile ARDL	Tourism significantly influences economic growth across quantiles, with stronger effects during economic downturns and bidirectional tourism-growth dynamics.	Tourism, GDP
Alcalá-Ordóñez & Segarra (2025)	Literature Review (57 studies)	Tourism positively contributes to socio-economic development by reducing poverty and inequality while improving living standards.	Tourism, development, inequality
Nugroho et al. (2025)	Regional CGE Model	Tourism expansion may reduce inter-regional disparities while increa-sing within-region inequality through resource reallocation effects.	Tourism, poverty, inequality, spillovers
Nguyen et al. (2025)	Panel Data (148 countries)	Tourism investment and consumption significantly improve employment performance, with stronger effects under higher institutional quality.	Tourism, employment
Bamiro et al. (2025)	Conceptual framework analysis	Halal coastal tourism supports financial inclusion and economic growth despite institutional and infrastructural constraints.	Halal tourism, financial inclusion, economic growth, infrastructure, certification
Wang et al. (2025)	Panel data with moderation	Integration of tourism development reduces income gaps, with FDI playing a significant moderating role.	Tourism integration, FDI, inequality
Singgalen (2025)	Digital ethnography	Halal tourism improves income and community empowerment but may weaken cultural sustainability.	Halal tourism, income, empowerment, sustainability
Xuanming et al. (2026)	PCSE and GMM	Tourism may increase inequality under weak economic and institutional conditions.	Tourism, inequality, institutions

Tourism and Employment Inclusion

Beyond aggregate growth effects, recent studies increasingly examine whether tourism development contributes to more inclusive labor market outcomes. Tourism-related industries are generally labor-intensive and may stimulate employment creation through hospitality services, transportation, retail activities, infrastructure expansion, and local business development. As summarized in Table 1, several empirical studies document a positive relationship between tourism expansion and employment generation. Sokhanvar & Çiftçioğlu (2022) demonstrate that tourism sector expansion causally affects unemployment and growth dynamics, while Bolukoglu & Gozukucuk (2024) show that tourism development improves gender-related employment indicators across European economies. Nguyen et al. (2025) further report that tourism investment and tourism consumption significantly enhance employment performance, particularly in countries supported by stronger institutional quality. Despite these positive findings, the inclusiveness of tourism-generated employment remains debated. In several economies, tourism jobs are often seasonal, informal, low-skilled, or concentrated within vulnerable service sectors, limiting their long-run contribution to labor market inclusion. These differing outcomes indicate that the employment effects of tourism depend heavily on institutional capacity, labor market structures, and the absorptive capability of local economies.

Tourism and Income Inequality Outcomes

The relationship between tourism development and income inequality also remains theoretically and empirically contested. On one hand, tourism expansion may reduce inequality by creating local employment opportunities, stimulating regional development, increasing household income, and strengthening economic participation among lower-income groups. As reported in Table 1, Subramaniam et al. (2022), Wang & Bai (2023), and Alcalá-Ordóñez & Segarra (2025) provide evidence that tourism contributes positively to socio-economic inclusion and narrowing income disparities. On the other hand, several studies argue that tourism may intensify inequality when tourism-related gains are disproportionately captured by capital owners, tourism-intensive regions, or higher-income groups. Camacho & Ramos-Herrera (2025), Nugroho et al. (2025), and Xuanming et al. (2026) demonstrate that tourism expansion may widen inequality under certain structural and institutional conditions. Kumail et al. (2023) further identify an inverted U-shaped relationship, indicating that tourism may initially exacerbate inequality before eventually contributing to more balanced income distribution as tourism development matures. These contrasting findings suggest that tourism-induced distributional outcomes are highly context-dependent and influenced by investment structures, institutional quality, regional spillovers, and the distributional pattern of tourism-generated income.

Muslim-Friendly Tourism as a Distinct Development Model

Recent discussions increasingly position Muslim-friendly tourism as a distinct development model extending beyond conventional tourism expansion. In this section, studies on halal tourism and Islamic tourism are discussed only as related strands of literature, while the present study retains Muslim-friendly tourism as the main conceptual term because it emphasizes broader destination readiness. Unlike traditional tourism approaches that primarily emphasize visitor arrivals and aggregate tourism receipts, Muslim-friendly tourism incorporates halal-compliant services, culturally compatible infrastructure, institutional support, financial inclusion, and community-oriented development dimensions. As summarized in Table 1, emerging evidence indicates that Muslim-friendly tourism contributes not only to economic growth, but also to employment creation, infrastructure development, financial inclusion, cultural preservation, and community empowerment. Qoir (2024) finds that halal tourism development strengthens economic growth across OIC countries through Muslim-friendly facilities and destination promotion. Heembo & Nuyeam (2024) further show that halal tourism contributes to local revenue generation, employment expansion, and infrastructure investment while supporting cultural sustainability. Bamiro et al. (2025) emphasize the importance of institutional support, certification systems, infrastructure development, and technological innovation in strengthening halal tourism performance and financial inclusion. Similarly, Singgalen (2025) highlights the role of halal tourism in increasing local income and artisan empowerment, although commercialization pressures may challenge long-run cultural sustainability. Despite the expanding literature, several important issues remain insufficiently addressed. Existing studies predominantly investigate tourism, economic growth, employment, and income inequality in separate or partial analytical settings, thereby limiting understanding of the interconnected mechanisms linking tourism development with broader socio-economic outcomes. Cross-country evidence simultaneously integrating tourism activity, macroeconomic conditions, labor market performance, and income distribution remains relatively limited, particularly within the context of Muslim-friendly tourism destinations. Moreover, prior studies rarely examine the dynamic short-run and long-run relationships among these variables within a unified empirical framework. Unlike earlier studies that mainly focus on isolated tourism-growth or tourism-inequality relationships, the present study develops an integrated macroeconomic framework linking Muslim-friendly tourism, economic growth, unemployment, and income inequality simultaneously. Accordingly, this study examines the long-run and short-run associations between Muslim-friendly tourism, economic growth, unemployment, and income inequality across leading destinations identified in the Global Muslim Travel Index (GMTI) 2024. It further explores whether economic growth functions as an indicative transmission channel linking tourism performance with the two inclusion-related outcomes.

Proposed Research Conceptual Framework

Figure 1 presents the conceptual framework of the study. The framework proposes that tourism expenditure, exchange rate, inflation, and foreign direct investment are associated with economic growth in both the short run and the long run. Economic growth is then positioned as an indicative transmission channel through which tourism performance and macroeconomic fundamentals are linked to unemployment and income inequality outcomes. In addition to these growth-

related indirect pathways, the framework also incorporates direct associations between tourism expenditure, macroeconomic variables, unemployment, and income inequality. By integrating these relationships into a unified empirical structure, the proposed framework provides a basis for examining how tourism performance in leading Muslim-friendly destinations is linked to growth and inclusion.

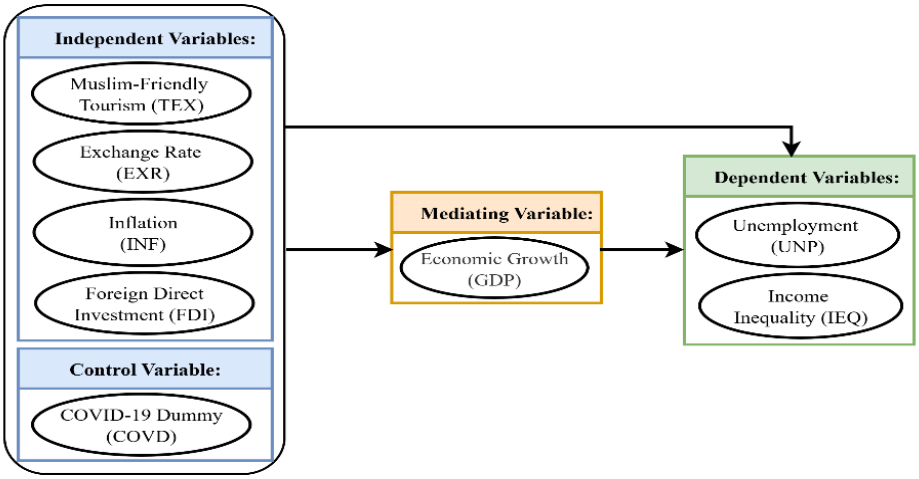


Figure 1. Research Framework

MATERIALS AND METHODS

Data and Sample Selection

This study uses a balanced panel dataset covering the top 20 Muslim-friendly tourism destinations identified in the Global Muslim Travel Index (GMTI) 2024, including Indonesia, Malaysia, Saudi Arabia, Türkiye, the United Arab Emirates, Qatar, Iran, Jordan, Brunei, Oman, Singapore, Egypt, Kuwait, Maldives, Uzbekistan, Morocco, Bahrain, Pakistan, Tunisia, and Azerbaijan. The analysis covers the period 2010–2024, providing 15 annual observations for each country. The use of the GMTI 2024 ranking to define a sample covering 2010–2024 requires careful clarification. The 2024 edition is not treated as evidence that the same countries occupied identical ranking positions throughout the entire study period. Instead, it is used as a contemporary reference point for identifying a policy-relevant group of destinations with strong structural relevance in the Muslim-friendly tourism market (Mastercard & CrescentRating, 2024). This approach is justified by the sampled countries' visibility in Muslim-friendly tourism, halal-related service ecosystems, destination branding, tourism infrastructure, and policy orientation toward Muslim travelers. The sampling strategy therefore follows a longitudinal relevance logic rather than a strict retrospective ranking logic. This strategy also reflects a practical data consideration. Earlier GMTI editions are not fully comparable across time because of changes in country coverage, indicators, scoring procedures, and weighting structures. Constructing an annual rolling sample based on changing rankings would reduce panel consistency and potentially introduce instability into the empirical design. For this reason, the study uses a balanced panel of countries identified as leading Muslim-friendly destinations in GMTI 2024 and examines within-country changes over 2010–2024. The findings should consequently be interpreted as evidence for a group of leading Muslim-friendly destinations, not as estimates for countries that necessarily held identical top-20 positions in every year of the study period.

Variables, Measurement, and Data Sources

The empirical analysis examines the relationships among Muslim-friendly tourism expenditure, macroeconomic fundamentals, economic growth, unemployment, and income inequality. The operational definitions, measurement procedures, and data sources of all variables are reported in Table 2.

Table 2. Variables, Measurement, and Data Sources
(Note. TEX, EXR, and FDI are log-transformed; all other variables retain their original units)

Variable	Symbol	Measurement	Source
Income Inequality	INQ	Income share held by the top 10% of the population (proportion, 0–1)	World Inequality Database
Unemployment	UNP	Unemployment rate (% of total labor force)	World Bank
Economic Growth	GDP	GDP growth (annual %)	World Bank
Muslim-Friendly Tourism	TEX	Total tourism expenditure in leading Muslim-friendly tourism destinations (current US$)	UN Tourism
Exchange Rate	EXR	Official exchange rate (LCU per US$, annual average)	World Bank
Inflation	INF	Inflation, consumer prices (annual %)	World Bank
Foreign Direct Investment	FDI	Net FDI inflows (BoP, current US$)	World Bank
COVID-19 Dummy	DCOV	Dummy variable representing the COVID-19 disruption period (1 = 2020–2022; 0 otherwise)	Authors' construction

Economic growth (GDP), unemployment (UNP), and income inequality (INQ) are used as the main development outcomes. GDP is measured by annual GDP growth and reflects macroeconomic expansion. UNP is measured as the

unemployment rate and represents the labor market dimension of inclusion. INQ is measured by the income share held by the top 10% of the population and captures the distributional dimension of inclusion. Tourism expenditure (TEX), exchange rate (EXR), inflation (INF), foreign direct investment (FDI), and the COVID-19 dummy (DCOV) are included to represent tourism performance, external competitiveness, price stability, capital inflows, and pandemic-related disruption, respectively.

Tourism expenditure (TEX) refers to total tourism spending at the destination level and is not intended to measure expenditure made exclusively by Muslim travelers. Because internationally comparable data on Muslim-specific tourist expenditure are not consistently available across countries and years, TEX is used as a destination-level proxy for tourism performance within leading Muslim-friendly tourism destinations. This approach is consistent with the Global Muslim Travel Index framework, which assesses destinations based on their capacity to serve Muslim travelers through access, communication, environment, and service-related dimensions (Mastercard & CrescentRating, 2024). Accordingly, TEX should be interpreted as an aggregate tourism performance indicator for countries recognized as leading Muslim-friendly destinations, rather than as a direct measure of Muslim-specific tourist spending. The use of aggregate tourism indicators is common in cross-country tourism studies when segment-specific data are unavailable or incomplete (Alcalá-Ordóñez & Segarra, 2025; Bhatt et al., 2024; Nguyen et al., 2025). Income inequality (INQ) is measured by the income share held by the top 10% of the population. Unlike the Gini coefficient, which summarizes inequality across the overall income distribution, this indicator focuses more directly on income concentration among upper-income groups. This measure is relevant because tourism-related expansion may generate uneven gains across firms, sectors, regions, and income groups, especially when benefits are concentrated among capital owners, formal tourism enterprises, property owners, or high-value service providers. Therefore, the top 10% income share helps assess whether tourism-oriented growth is associated with greater income concentration or with more inclusive income distribution. This choice is consistent with tourism-inequality studies showing that the distributional effects of tourism depend on institutional conditions, investment patterns, regional spillovers, and the structure of tourism-generated income (Nguyen et al., 2021; Subramaniam et al., 2022; Kumail et al., 2023; Wang & Bai, 2023). Tourism expenditure, exchange rate, and foreign direct investment are transformed into natural logarithms to reduce scale differences, improve distributional properties, and mitigate heteroscedasticity. The COVID-19 dummy (DCOV) is coded 1 for 2020–2022 and 0 otherwise. This coding captures the main full-year global disruption period after the World Health Organization characterized COVID-19 as a pandemic on March 11, 2020 and before the global emergency phase ended on May 5, 2023 (World Health Organization, 2026). The variable controls for pandemic-related shocks to tourism activity, international mobility, economic growth, labor markets, and income distribution.

Model Specification and Estimation Strategy

To examine both long-run equilibrium relationships and short-run dynamic adjustments, this study applies a Panel Autoregressive Distributed Lag (Panel ARDL) model estimated using the Pooled Mean Group (PMG) estimator. The PMG estimator is suitable for dynamic heterogeneous panels because it allows short-run coefficients, adjustment speeds, and error variances to vary across countries, while restricting long-run coefficients to be common only when this assumption is empirically supported (Pesaran et al., 1999; Espoir et al., 2023). This feature is important for the present study because the sampled destinations differ in income levels, tourism structures, institutional settings, and macroeconomic conditions, but may still share long-run equilibrium relationships linking tourism performance, economic growth, unemployment, and income inequality. The long-run homogeneity assumption is formally assessed using the Hausman test.

The insignificant Hausman p-values reported across all models indicate that the null hypothesis of long-run homogeneity cannot be rejected, supporting the use of PMG relative to the fully heterogeneous Mean Group estimator. Thus, the empirical strategy does not impose long-run homogeneity without statistical evaluation. Instead, common long-run coefficients are estimated only after the restriction is supported by the Hausman results, while country-specific short-run dynamics remain unrestricted. This approach therefore addresses heterogeneity through unrestricted short-run dynamics while relying on the Hausman test to justify the common long-run specification.

The empirical specification is organized into five interrelated models. Model 1 estimates the long-run and short-run relationships between Muslim-friendly tourism performance, macroeconomic fundamentals, and economic growth. Models 2 and 3 examine the direct relationships between the same explanatory variables and the two inclusion outcomes, namely unemployment and income inequality. Models 4 and 5 then incorporate economic growth as an additional explanatory variable to assess whether growth functions as a transmission channel linking tourism performance and macroeconomic fundamentals with unemployment and income inequality. This structure allows the analysis to distinguish direct associations from growth-related transmission pathways. The Panel ARDL specifications are presented as follows:

Model 1: Long-run and short-run direct effects of Muslim-friendly tourism, exchange rate, inflation, and foreign direct investment on economic growth.

$$\Delta GDP_{it} = \beta_{01} + \sum_{j=1}^{p-1} \beta_{11} \Delta GDP_{i,t-j} + \sum_{j=0}^{q-1} \beta_{12} \Delta TEX_{i,t-j} + \sum_{j=0}^{q-1} \beta_{13} \Delta EXR_{i,t-j} + \sum_{j=0}^{q-1} \beta_{14} \Delta INF_{i,t-j} + \sum_{j=0}^{q-1} \beta_{15} \Delta FDI_{i,t-j} + \sum_{j=0}^{q-1} \beta_{16} \Delta DCOV_{i,t-j} + \theta_{11} GDP_{i,t-1} + \theta_{12} TEX_{i,t-1} + \theta_{13} EXR_{i,t-1} + \theta_{14} INF_{i,t-1} + \theta_{15} FDI_{i,t-1} + \theta_{16} DCOV_{i,t-1} + \varepsilon_{1it} \quad (1)$$

Model 2: Long-run and short-run direct effects of Muslim-friendly tourism, exchange rate, inflation, and foreign direct investment on unemployment.

$$\Delta UNP_{it} = \beta_{02} + \sum_{j=1}^{p-1} \beta_{21} \Delta UNP_{i,t-j} + \sum_{j=0}^{q-1} \beta_{22} \Delta TEX_{i,t-j} + \sum_{j=0}^{q-1} \beta_{23} \Delta EXR_{i,t-j} + \sum_{j=0}^{q-1} \beta_{24} \Delta INF_{i,t-j} + \sum_{j=0}^{q-1} \beta_{25} \Delta FDI_{i,t-j} + \sum_{j=0}^{q-1} \beta_{26} \Delta DCOV_{i,t-j} + \theta_{21} UNP_{i,t-1} + \theta_{22} TEX_{i,t-1} + \theta_{23} EXR_{i,t-1} + \theta_{24} INF_{i,t-1} + \theta_{25} FDI_{i,t-1} + \theta_{26} DCOV_{i,t-1} + \varepsilon_{2it} \quad (2)$$

Model 3: Long-run and short-run direct effects of Muslim-friendly tourism, exchange rate, inflation, and foreign direct investment on income inequality.

$$\Delta INQ_{it} = \beta_{03} + \sum_{j=1}^{p-1} \beta_{31} \Delta INQ_{i,t-j} + \sum_{j=0}^{q-1} \beta_{32} \Delta TEX_{i,t-j} + \sum_{j=0}^{q-1} \beta_{33} \Delta EXR_{i,t-j} + \sum_{j=0}^{q-1} \beta_{34} \Delta INF_{i,t-j} + \sum_{j=0}^{q-1} \beta_{35} \Delta FDI_{i,t-j} + \sum_{j=0}^{q-1} \beta_{36} \Delta DCOV_{i,t-j} + \theta_{31} INQ_{i,t-1} + \theta_{32} TEX_{i,t-1} + \theta_{33} EXR_{i,t-1} + \theta_{34} INF_{i,t-1} + \theta_{35} FDI_{i,t-1} + \theta_{36} DCOV_{i,t-1} + \varepsilon_{3it} \quad (3)$$

Model 4: The indicative transmission role of economic growth in the long-run and short-run associations between Muslim-friendly tourism, exchange rate, inflation, foreign direct investment, and unemployment.

$$\Delta UNP_{it} = \beta_{04} + \sum_{j=1}^{p-1} \beta_{41} \Delta UNP_{i,t-j} + \sum_{j=0}^{q-1} \beta_{42} \Delta GDP_{i,t-j} + \sum_{j=0}^{q-1} \beta_{43} \Delta TEX_{i,t-j} + \sum_{j=0}^{q-1} \beta_{44} \Delta EXR_{i,t-j} + \sum_{j=0}^{q-1} \beta_{45} \Delta INF_{i,t-j} + \sum_{j=0}^{q-1} \beta_{46} \Delta FDI_{i,t-j} + \sum_{j=0}^{q-1} \beta_{47} \Delta DCOV_{i,t-j} + \theta_{41} UNP_{i,t-1} + \theta_{42} GDP_{i,t-1} + \theta_{43} TEX_{i,t-1} + \theta_{44} EXR_{i,t-1} + \theta_{45} INF_{i,t-1} + \theta_{46} FDI_{i,t-1} + \theta_{47} DCOV_{i,t-1} + \varepsilon_{4it} \quad (4)$$

Model 5: The indicative transmission role of economic growth in the long-run and short-run associations between Muslim-friendly tourism, exchange rate, inflation, foreign direct investment, and income inequality.

$$\Delta INQ_{it} = \beta_{05} + \sum_{j=1}^{p-1} \beta_{51} \Delta INQ_{i,t-j} + \sum_{j=0}^{q-1} \beta_{52} \Delta GDP_{i,t-j} + \sum_{j=0}^{q-1} \beta_{53} \Delta TEX_{i,t-j} + \sum_{j=0}^{q-1} \beta_{54} \Delta EXR_{i,t-j} + \sum_{j=0}^{q-1} \beta_{55} \Delta INF_{i,t-j} + \sum_{j=0}^{q-1} \beta_{56} \Delta FDI_{i,t-j} + \sum_{j=0}^{q-1} \beta_{57} \Delta DCOV_{i,t-j} + \theta_{51} INQ_{i,t-1} + \theta_{52} GDP_{i,t-1} + \theta_{53} TEX_{i,t-1} + \theta_{54} EXR_{i,t-1} + \theta_{55} INF_{i,t-1} + \theta_{56} FDI_{i,t-1} + \theta_{57} DCOV_{i,t-1} + \varepsilon_{5it} \quad (5)$$

Models 4 and 5 are specified to examine whether economic growth serves as an indicative transmission channel through which tourism performance and macroeconomic fundamentals are associated with unemployment and income inequality. Given the macro-panel dynamic nature of the study, this mediation specification is interpreted as evidence of indirect association rather than as definitive causal mediation, particularly because lagged adjustment and potential endogeneity may affect the transmission process.

In the above specifications, *INQ* denotes income inequality; *UNP* denotes the unemployment rate; *GDP* denotes annual GDP growth; *TEX* represents tourism performance in leading Muslim-friendly destinations, proxied by total tourism expenditure; *EXR* denotes the exchange rate; *INF* denotes inflation; *FDI* denotes foreign direct investment; and *DCOV* denotes the COVID-19 dummy. The definitions, measurement units, and data sources of these variables are provided in Table 2. The coefficients β capture short-run dynamics, while θ represents the lagged-level coefficients from which long-run relationships are derived; Δ denotes the first-difference operator; p and q denote lag lengths; i refers to countries; t refers to annual time periods; and ε represents the error term.

The error correction term (ECT) captures the speed of adjustment from short-run disequilibrium toward long-run equilibrium. A negative and statistically significant ECT provides evidence of long-run adjustment among the variables. Prior to Panel ARDL estimation, cross-sectional dependence is examined using the Pesaran CD test (Pesaran, 2015). Because cross-sectional dependence is detected, the CIPS unit root test is employed to account for cross-country dependence in the stationarity assessment. The Panel ARDL approach is appropriate when variables are integrated at I(0), I(1), or a mixture of both, but not when any variable is I(2). After establishing the integration order, the Pedroni panel cointegration test is applied as a preliminary diagnostic for long-run association. However, because Pedroni-type tests are first-generation tests and may be sensitive to cross-sectional dependence, the results are interpreted cautiously.

The main evidence for long-run equilibrium is therefore taken from the ARDL–PMG error correction mechanism, particularly the negative and statistically significant ECT across the estimated models. Although PMG–ARDL captures dynamic adjustment and allows heterogeneous short-run responses, it does not explicitly model unobserved common factors in the same way as CS-ARDL or Common Correlated Effects estimators. This limitation is acknowledged, and future studies may extend the analysis using estimators that directly account for common factors.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 3 reports descriptive statistics for 300 balanced panel observations covering 20 Muslim-friendly tourism destinations during 2010–2024. The results indicate considerable cross-country variation. Economic growth averages 3.58%, ranging from −32.91% to 37.51%, reflecting the contraction and recovery during the COVID-19 shock. Inflation averages 6.31% but shows substantial dispersion, while unemployment averages 6.48% with notable cross-country variation. Income inequality averages 0.477. Logarithmic transformations are applied to tourism expenditure, exchange rate, and foreign direct investment to reduce scale heterogeneity.

Table 3. Descriptive Statistics of the Variables (2010–2024) (Source: Secondary data processed, 2026)

Variable	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis	JB (p-value)
INQ	0.4769	0.0603	0.3542	0.5775	-0.2609	2.2735	9.467 (0.0088)
UNP	6.4780	4.5237	0.1300	19.8370	0.9321	3.0958	41.234 (0.0000)
GDP	3.5775	4.5973	-32.9088	37.5079	-0.3702	26.5573	6573.350 (0.0000)
TEX	8.2663	1.5602	-0.1791	10.9656	-1.2825	7.0708	273.951 (0.0000)
EXR	2.3728	3.3841	-1.2874	10.6454	1.2768	3.4321	79.367 (0.0000)
INF	6.3119	9.6352	-2.4253	72.3088	3.4205	17.4839	3036.245 (0.0000)
FDI	21.8347	1.5394	17.1863	25.7472	0.2292	2.8795	2.658 (0.2647)

Cross-Section Dependence Test

Prior to estimating the panel ARDL model, cross-sectional dependence was tested using the Pesaran (2015) CD test. The results in Table 4 show that all variables exhibit statistically significant CD statistics ($p < 0.01$), indicating strong cross-country interdependence. The null hypothesis of cross-sectional independence is therefore rejected.

Table 4. Cross-Section Dependence Test (Pesaran CD) (Source: Secondary data processed, 2026)

Variable	Pesaran CD Statistic	p-value
INQ	6.8745	0.0000
UNP	8.4357	0.0000
GDP	20.2303	0.0000
TEX	23.1074	0.0000
EXR	20.8849	0.0000
INF	10.8651	0.0000
FDI	5.9327	0.0000

Panel Unit Root Test Results

Following the detection of cross-sectional dependence, panel unit root tests were conducted using the PP–Fisher and Pesaran (2007) CIPS tests. While PP–Fisher assumes cross-sectional independence, CIPS accounts for cross-sectional dependence and is therefore more appropriate. The results indicate mixed integration orders: GDP and TEX are stationary at level, while INQ, UNP, EXR, INF, and FDI become stationary after first differencing. As no variable is integrated of order two, the panel ARDL approach remains valid. The final integration order follows the CIPS results.

Table 5. PP–Fisher and CIPS Unit Root Test Results (Source: Secondary data processed, 2026)
Note: ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. PP–Fisher reports Chi-square statistics under the assumption of cross-sectional independence, while CIPS reports Pesaran (2007) statistics that account for cross-sectional dependence. Given the presence of cross-sectional dependence, the final integration order follows the CIPS results

Variable	Phillips-Perron Fisher		Cross-sectionally Augmented IPS (CIPS)		Final Order
	Level I(0)	First Difference I(1)	Level I(0)	First Difference I(1)	
INQ	165.352***	-	-2.103	-3.215***	I(1)
UNP	63.673**	-	-2.211	-3.467***	I(1)
GDP	208.428***	-	-2.821**	-	I(0)
TEX	78.646***	-	-3.285***	-	I(0)
EXR	32.673	103.370***	-2.215	-3.874***	I(1)
INF	61.457**	-	-2.295	-2.843*	I(1)
FDI	66.246***	-	-2.610	-3.155***	I(1)

Panel Cointegration Test Results

After establishing the integration order, the Pedroni panel cointegration test was applied to examine possible long-run associations among the variables (Pedroni, 2004). Because the Pedroni test is a first-generation cointegration test and may be sensitive to cross-sectional dependence, it is used only as a preliminary diagnostic rather than as definitive evidence of cointegration. Accordingly, the results are interpreted cautiously in light of the cross-sectional dependence detected earlier using the Pesaran CD test (Pesaran, 2015).

The results in Table 6 show that both within-dimension and between-dimension statistics are statistically significant at the 1% level, providing preliminary evidence of long-run association among the variables. However, the main evidence for

long-run equilibrium is taken from the ARDL–PMG error correction mechanism, particularly the negative and statistically significant ECT reported across the estimated models. This interpretation is consistent with the PMG–ARDL framework, which estimates long-run relationships through an error correction representation (Pesaran et al., 1999). Thus, the Pedroni results are used to support, but not solely establish, the presence of long-run relationships. These findings provide a cautious basis for proceeding with the panel ARDL–PMG estimation of long-run and short-run dynamics.

Table 6. Pedroni Panel Cointegration Test Results (Source: Secondary data processed, 2026)

Within-dimension (panel statistics)			**Between-dimension (group statistics)**		
Statistic	**Value**	**p-value**	**Statistic**	**Value**	**p-value**
Panel v-statistic	3.483	0.0002	Group rho-statistic	-3.121	0.0009
Panel rho-statistic	4.012	0.0016	Group PP-statistic (Z-t)	-6.104	0.0000
Panel PP-statistic (Z-t)	-6.843	0.0000	Group ADF-statistic (Z-t)	-4.286	0.0000
Panel ADF-statistic (Z-t)	-4.574	0.0000			

Panel ARDL Estimation Results

To examine the dynamic relationships among Muslim-friendly tourism, macroeconomic variables, and socioeconomic outcomes, five panel ARDL models were estimated using the pooled mean group (PMG) estimator. This approach allows long-run parameters to remain homogeneous across countries while permitting heterogeneous short-run dynamics, making it suitable for macro-panel analysis. The Hausman tests support the PMG specification, as the null hypothesis of long-run homogeneity cannot be rejected across models (Ishker et al., 2026). The Wald statistics confirm the joint significance of the long-run regressors, while the negative and significant error correction terms indicate stable long-run equilibrium relationships.The estimated long-run coefficients, short-run dynamics, and model diagnostics for Models 1–5 are reported in Table 7. Across all specifications, the error correction term (ECT) is negative and statistically significant, providing evidence of adjustment toward long-run equilibrium. The adjustment coefficients range from −0.26 to −0.99, indicating moderate to relatively rapid convergence toward equilibrium following short-run disturbances.

Table 7. Panel ARDL–PMG Estimation Results (Models 1–5) (Source: Secondary data processed, 2026) Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. p-values are reported in parentheses. Hausman tests support the PMG estimator (p > 0.05). The negative and significant ECT indicates adjustment toward long-run equilibrium across models

Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Long-run					
GDP	—	—	—	-0.3064***	-0.2149***
TEX	0.5829***	-0.4273***	-0.2154***	0.5837***	-0.1483***
EXR	0.1627***	-0.1468***	-0.0828***	-0.1188***	0.0712***
INF	-0.0113	0.0092	0.0341***	0.0745***	0.0298***
FDI	0.7102***	-0.1198***	-0.1487***	-0.1917**	-0.1324***
DCOV	-1.9500***	0.6330***	0.2948***	0.7560***	0.2848***
Short-run					
ECT(-1)	-0.9975***	-0.4220***	-0.3568***	-0.2558***	-0.3124***
ΔGDP	—	—	—	-0.1096***	-0.0828***
ΔTEX	1.8544**	0.2125	-0.0626	-0.3965**	-0.0538
ΔEXR	0.0746	-0.0539*	0.0219	-0.0421**	0.0184
ΔINF	-0.1422*	-0.0641***	0.0124**	-0.0647**	0.0118**
ΔFDI	0.8322	-0.1332	-0.0420	-0.1804	-0.0499
ΔDCOV	-3.4804**	0.9800***	0.1842**	0.8874***	0.1679**
Diagnostics					
Log-Likelihood	-471.177	-47.835	312.449	-33.942	318.774
Hausman test (p-value)	0.6298	0.3002	0.4268	0.4069	0.2493
Wald test (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000
Selected model	PMG(1,1,1,1,1,1)	PMG(1,1,1,1,1,1)	PMG(1,1,1,1,1,1)	PMG(1,1,1,1,1,1,1)	PMG(1,1,1,1,1,1,1)

In the economic growth equation (Model 1), Muslim-friendly tourism expenditure exhibits a positive and statistically significant long-run association with economic growth, indicating that sustained tourism development is linked to broader economic expansion. This finding is consistent with the tourism-led growth perspective, which emphasizes the role of tourism in supporting output growth through sectoral linkages, capital accumulation, and productivity spillovers (Nugroho & Verikios, 2025; Alqaralleh et al., 2025). Similar evidence from OIC economies also suggests that tourism activity and tourist arrivals are positively associated with economic performance (Qoir, 2024). Foreign direct investment likewise demonstrates a strong positive long-run relationship with growth, suggesting that capital inflows are linked to stronger productive capacity and structural development (Emako et al., 2023; Chtioui & Boushib, 2025; Setiawan et al., 2025). Exchange rate movements appear to be associated with improved economic performance through external competitiveness channels, although excessive volatility may weaken growth conditions (Olamide et al., 2022; Oyadeyi et al., 2025). Inflation does not show a significant long-run relationship with growth; however, short-run estimates indicate that tourism expenditure is positively associated with growth, whereas inflation exerts a negative short-run effect.

Turning to unemployment (Model 2), tourism expenditure exhibits a significant negative long-run association with unemployment, which may reflect the labor-intensive characteristics of tourism-related activities. This finding is consistent with cross-country evidence suggesting that tourism investment and expenditure are positively linked to employment generation (Nguyen et al., 2025) and that a larger tourism contribution to GDP is associated with lower unemployment rates (Sokhanvar & Çiftçioğlu, 2022). Foreign direct investment likewise shows a negative long-run relationship with unemployment, indicating that capital inflows may support labor demand expansion and productive capacity development (Chtioui & Boushib, 2025; Setiawan et al., 2025). Exchange rate movements also appear to be associated with declining unemployment, although existing studies primarily emphasize exchange rate interactions with growth and inflation rather than a direct exchange rate–unemployment transmission mechanism (Olamide et al., 2022; Alemu, 2025). Inflation does not exhibit a significant long-run relationship with unemployment; however, short-run dynamics suggest that macroeconomic volatility may temporarily influence labor market conditions (Olamide et al., 2022).

The results for income inequality (Model 3) indicate that tourism expenditure exhibits a significant negative long-run association with income inequality, supporting the inclusive growth perspective in which tourism development is linked to broader income-generating opportunities across sectors. Previous empirical studies similarly suggest that tourism may function as a mechanism for income equalization across countries (Subramaniam et al., 2022; Nguyen et al., 2021), while tourism investment is also associated with long-run inequality reduction (Kumail et al., 2023).

Foreign direct investment likewise demonstrates a negative long-run relationship with inequality when supported by adequate institutional and financial development conditions (Lee et al., 2022), although its distributional implications may differ across countries depending on risk environments (Wang & Lee, 2023). In contrast, inflation shows a positive association with income inequality, consistent with nonlinear evidence indicating that higher inflation disproportionately affects lower-income groups (Moradizadeh et al., 2022). Monetary regimes emphasizing inflation targeting may also be linked to higher inequality outcomes (Altunbaş & Thornton, 2022). Exchange rate effects on income inequality remain less clearly established in the existing literature. When economic growth is incorporated into the unemployment and inequality equations (Models 4 and 5), GDP exhibits a negative and statistically significant long-run association with both unemployment and income inequality. This finding suggests that sustained economic expansion is linked to improved labor market performance and more equitable income distribution.

The inverse growth–unemployment relationship is consistent with Okun-type mechanisms connecting output expansion with employment improvement (Gruiescu et al., 2026). Tourism expenditure remains statistically significant even after controlling for GDP, indicating that tourism is associated with unemployment and inequality through both aggregate economic expansion and sector-specific channels. In the short run, GDP growth is negatively associated with unemployment (Setiawan et al., 2025), while inflation continues to exhibit a positive relationship with inequality, consistent with earlier findings (Moradizadeh et al., 2022; Altunbaş & Thornton, 2022). However, empirical evidence directly linking inflation to higher unemployment remains relatively limited in the existing literature.

Structural Heterogeneity

The estimated relationships should be interpreted in light of the structural heterogeneity among the sampled destinations. The sample includes GCC and non-GCC countries, high-income and middle-income economies, island-based destinations, and large continental tourism markets. These destinations differ in governance systems, institutional quality, labor market structures, tourism dependence, fiscal capacity, and destination development models. Such differences may condition how tourism performance is associated with economic growth, unemployment, and income inequality. Previous studies also show that tourism-related outcomes vary across income groups, institutional settings, regional structures, and destination characteristics (Odeleye et al., 2022; Nguyen et al., 2025; Wang & Bai, 2023; Xuanming et al., 2026).

Accordingly, the long-run coefficients estimated in this study should be understood as average long-run associations across leading Muslim-friendly destinations rather than as uniform relationships that apply identically to all countries. Although subgroup analysis could provide additional insights, the relatively small sample of 20 countries limits the reliability of separate subgroup estimations within the Panel ARDL–PMG framework. The PMG estimator partly addresses heterogeneity by allowing short-run coefficients, adjustment speeds, and error variances to differ across countries, while the common long-run specification is evaluated using the Hausman test.

Growth as an Indicative Transmission Channel

To further examine whether economic growth functions as an indirect transmission channel, this study applies the Sobel test as a supplementary assessment of indirect associations in both long-run and short-run specifications. The Sobel test is not used as a stand-alone causal mediation strategy, nor is it intended to replace the dynamic evidence obtained from the Panel ARDL–PMG estimations. Rather, it provides an indicative test of whether the product of the estimated tourism-growth and growth-outcome coefficients is statistically different from zero. This interpretation is consistent with the use of indirect-effect testing as a complementary procedure in mediation analysis (Preacher & Hayes, 2008). Related applied studies have also used mediation concepts to examine indirect transmission mechanisms in aggregate, macro-level, or panel-oriented empirical contexts, while emphasizing the need for cautious interpretation (Lin & Li, 2022; Liu et al., 2019; Feng et al., 2023).

Because this study is based on a macro-panel dynamic framework, the mediation results are interpreted cautiously. Lagged adjustment, possible endogeneity, and cross-country heterogeneity mean that mediation should be understood as an indicative transmission mechanism rather than definitive causal mediation. Therefore, the main conclusions remain grounded primarily in the PMG–ARDL long-run coefficients, short-run dynamics, and error-correction terms, while the

Sobel results are used only to complement the interpretation of growth-related indirect pathways. Table 8 presents the mediation results for Models 4 and 5, where GDP is examined as an indirect transmission channel linking tourism performance and macroeconomic fundamentals with unemployment (UNP) and income inequality (INQ).

Table 8. Sobel Test of Indicative Indirect Associations

Note: ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. Model 4 examines mediation effects on unemployment (UNP), while Model 5 examines mediation effects on income inequality (INQ), with GDP as the mediating variable

Variable	Model 4			Model 5		
	UNP (Indirect Effect)	Sobel Z	Mediation	INQ (Indirect Effect)	Sobel Z	Mediation
Long-run						
TEX	-0.1786***	-2.697	Partial	-0.1253***	-2.578	Partial
EXR	-0.0499***	-2.773	Partial	-0.0350***	-2.644	Partial
INF	0.0035	0.636	None	0.0024	0.634	None
FDI	-0.2176***	-4.170	Partial	-0.1526***	-3.766	Partial
DCOV	0.5975***	4.681	Partial	0.4190***	4.130	Partial
Short-run						
ΔTEX	-0.2032*	-1.915	Partial	-0.1534*	-1.826	Partial
ΔEXR	-0.0082	-1.159	None	-0.0062	-1.138	None
ΔINF	0.0156	1.560	None	0.0118	1.511	None
ΔFDI	-0.0912	-1.334	None	-0.0688	-1.303	None
ΔDCOV	0.3814*	1.846	Partial	0.2878*	1.766	Partial

In the long run, tourism expenditure (TEX) exhibits a statistically significant indirect association with unemployment through economic growth. The positive relationship between tourism and GDP, combined with the negative relationship between GDP and unemployment, generates a negative indirect pathway, suggesting that tourism is linked to improved labor market outcomes partly through growth expansion. The Sobel statistic indicates partial mediation, implying that tourism is associated with employment both directly through labor-intensive service activities and indirectly through broader macroeconomic expansion. These mediation results should be interpreted as indicative transmission mechanisms rather than definitive causal pathways. The findings remain consistent with the tourism-led growth framework, which highlights the role of tourism in supporting economic activity through investment expansion, sectoral linkages, and productivity gains (Nugroho & Verikios, 2025; Alqaralleh et al., 2025), while also being positively associated with employment performance across sectors (Nguyen et al., 2025; Sokhanvar & Çiftçioğlu, 2022).

Foreign direct investment (FDI) likewise demonstrates a significant partial mediation effect in the long run. By strengthening productive capacity through capital accumulation and technology transfer, FDI is positively associated with economic expansion and indirectly linked to improved labor market outcomes. Previous studies similarly suggest that FDI may contribute to lower unemployment under favorable macroeconomic and institutional conditions (Chtioui & Boushib, 2025; Setiawan et al., 2025). However, this relationship is not universal, as evidence from Turkey indicates that FDI does not always exhibit a significant long-run relationship with unemployment, implying that the effectiveness of this mechanism depends on country-specific structural conditions (Ceyhan, 2025).

For the exchange rate (EXR), previous studies suggest that currency movements are associated with economic performance through competitiveness and macroeconomic stability channels (Oyadeyi et al., 2025; Olamide et al., 2022). However, the existing literature does not consistently establish an indirect exchange rate–unemployment relationship operating through economic growth within a structured mediation framework. Consequently, empirical support for this transmission mechanism remains relatively limited. Inflation likewise does not exhibit a significant indirect relationship through economic growth. Although inflation may weaken economic performance beyond certain thresholds (Oyadeyi et al., 2025; Olamide et al., 2022), previous evidence does not clearly support an indirect inflation-growth-unemployment pathway within tourism-oriented macroeconomic settings. In the short run, mediation effects generally appear weaker, suggesting that labor market adjustments respond more directly to short-run macroeconomic volatility than to growth transmission mechanisms.

For income inequality, the long-run mediation results indicate that tourism expenditure also exhibits a significant indirect association through economic growth. The positive relationship between tourism and output, combined with the negative relationship between growth and inequality, generates a significant indirect pathway, suggesting that tourism is linked to more equitable income distribution through its growth-enhancing role. This finding is consistent with earlier evidence indicating that tourism is negatively associated with inequality and positively related to improved income distribution across economies (Subramaniam et al., 2022; Nguyen et al., 2021). Previous studies also suggest that tourism development may contribute to broader socio-economic progress, including poverty and inequality reduction under supportive institutional conditions (Alcalá-Ordóñez & Segarra, 2025).

Foreign direct investment similarly demonstrates a significant partial mediation effect. By strengthening economic performance, FDI indirectly influences income distribution through the growth channel. Previous studies indicate that FDI may contribute to lower inequality when supported by adequate financial development and institutional quality (Lee et al., 2022), although its distributional implications vary across countries depending on structural risk conditions (Wang & Lee, 2023). Exchange rate dynamics also display a mediated long-run association through economic growth; however, empirical evidence directly linking exchange rate movements to inequality reduction through growth transmission remains limited. Existing studies instead emphasize exchange rate relationships with growth and macroeconomic

stability (Olamide et al., 2022; Oyadeyi et al., 2025). Inflation does not exhibit a significant indirect relationship through growth. Nevertheless, substantial evidence indicates that inflation is positively associated with income inequality through nonlinear price-level effects, where higher inflation tends to worsen income distribution beyond certain thresholds (Moradizadeh et al., 2022). Monetary regimes emphasizing inflation targeting may also be linked to higher inequality under certain conditions (Altunbaş & Thornton, 2022).

Overall, the Sobel test suggests that economic growth functions as an important transmission mechanism linking tourism, exchange rates, and foreign direct investment with unemployment and income inequality, particularly in the long run. However, the mediation remains partial, as tourism continues to exhibit significant direct associations even after controlling for GDP. These findings indicate that Muslim-friendly tourism is associated with socio-economic outcomes both through aggregate economic expansion and through sector-specific structural channels.

CONCLUSION

This study examines the relationships among Muslim-friendly tourism, macroeconomic variables, economic growth, unemployment, and income inequality across the 20 leading destinations identified in the Global Muslim Travel Index 2024. Using a Panel PMG–ARDL framework complemented by Sobel-based indirect-effect analysis, the findings show that tourism expenditure has a positive long-run association with economic growth and negative long-run associations with unemployment and income inequality. Foreign direct investment is also linked to stronger growth and lower unemployment, while inflation is associated with higher income inequality. The supplementary mediation results suggest that economic growth may function as an indicative transmission pathway linking tourism performance and selected macroeconomic variables with unemployment and income inequality, although tourism expenditure continues to show direct long-run associations with both inclusion-related outcomes.

These findings suggest that Muslim-friendly tourism can be considered an important component of destination development strategies, rather than merely a short-term revenue source. Strengthening tourism ecosystems through infrastructure, service quality, digital integration, and supportive regulation may help reinforce the link between tourism performance, employment conditions, and inclusive growth. At the same time, foreign investment, exchange rate stability, and price stability appear important for creating macroeconomic conditions under which tourism-related expansion is more closely associated with durable socio-economic improvements.

Several limitations should be noted. First, the study uses national-level panel data, so it may not fully reflect regional differences in tourism development, labor market conditions, and income distribution within individual countries.

Second, tourism expenditure is used as a destination-level proxy for tourism performance in leading Muslim-friendly destinations because consistent cross-country data on Muslim-specific expenditure and destination-readiness indicators are not yet available. Future studies may use more direct measures, such as Muslim tourist arrivals, GMTI scores, halal infrastructure indicators, or composite Muslim-friendly destination readiness indices, together with alternative inequality indicators such as the Gini coefficient, Palma ratio, or bottom 40% income share.

Third, although the PMG–ARDL estimator is supported by the Hausman test and allows country-specific short-run dynamics, it does not explicitly capture unobserved common factors under cross-sectional dependence. Future research may extend the analysis using second-generation cointegration tests, CS-ARDL, Common Correlated Effects, or related approaches. Finally, the Sobel test is used only as a supplementary assessment of indirect associations; future studies may apply dynamic mediation, instrumental-variable, or panel causal mediation approaches when suitable data are available. Future research may also compare GCC and non-GCC countries, income groups, or island and continental destinations using larger samples or longer panels.

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Glossary: ARDL – Autoregressive Distributed Lag; CD – Cross-sectional Dependence; CIPS – Cross-sectionally Augmented Im–Pesaran–Shin; COVID-19 – Coronavirus Disease 2019; CS-ARDL – Cross-sectionally Augmented Autoregressive Distributed Lag; DCOV – COVID-19 Dummy; ECT – Error Correction Term; EXR – Exchange Rate; FDI – Foreign Direct Investment; GDP – Gross Domestic Product; GMM – Generalized Method of Moments; GMTI – Global Muslim Travel Index; INF – Inflation; INQ – Income Inequality; JB – Jarque–Bera; OIC – Organisation of Islamic Cooperation; PMG – Pooled Mean Group; PP–Fisher – Phillips–Perron Fisher Test; TEX – Tourism Expenditure; UNP – Unemployment Rate; WTTC – World Travel & Tourism Council.

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