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Determinantes econômicos influenciam um fenômeno de fé? Análise das peregrinações internacionais ao Santuário de Fátima[1]

Do economic determinants influence a faith phenomenon? Analysis of international pilgrimages to the Shrine of Fátima

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Resumo

A economia faz parte do cotidiano das sociedades e suas relações interferem diretamente no bem-estar social. Por essa razão, é importante verificar como determinantes econômicos podem influenciar um fenômeno de fé. Neste artigo, analisamos como as peregrinações internacionais ao Santuário de Fátima (Portugal) são afetadas por fatores econômicos. Foi construído um painel de dados estatísticos de 2008 a 2022. Um modelo em painel ARDL foi estimado. Os resultados confirmam a relação entre a economia e o *homo religiosus*. As peregrinações internacionais à Fátima são influenciadas pelo custo de transporte, renda, desemprego, globalização e inflação.

Palavras-chave: Determinantes econômicos. Peregrinações internacionais. Santuário de Fátima

Abstract

The economy is part of everyday life in modern societies and is a crucial determinant of social well-being. For this reason, it is important to observe how economic determinants can influence a fundamental social phenomenon: faith. This paper analyzes how economic determinants influence international pilgrimages to the Shrine of Fátima (Portugal). A data panel from 2008 to 2022 was constructed, and a panel ARDL model was estimated. The results confirm the relationship between economics and *homo religiosus*. The cost of transportation, national income, unemployment, globalization, and inflation influence the international pilgrimages to Fátima.

Keywords: Economic determinants. International pilgrimages. Shrine of Fátima.

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Introduction

Since the beginning of civilization, *homo religiosus* has assumed the existence of the sacred(s). Nevertheless, *homo religiosus* has been inserted in an economic world. The economic determinants (directly and indirectly) influence individual and social decisions in the most diverse areas, including religious practice. Studying phenomena like faith in the Catholic or other religions is difficult. However, there are several gaps to be developed in the literature, and among them, it is relevant to understand how economic determinants can influence a phenomenon of the Catholic faith. Regarding the number of believers, Catholicism is an olden religion and one of the most popular in the world.

Thousands of Catholic visitors and pilgrims fill its main places of devotion every year. Among them, the Shrines and Basilicas dedicated to Mary attract particular attention. In 2022 and 2023, more than 8 million people visited the Shrine of Aparecida (Brazil). The Shrine of Fátima (Portugal) registered almost 5 million visitors in 2022 and 6,8 million in 2023. This number is quite expressive, considering that we are living in a period of recovery from the global pandemic crisis caused by COVID-19.

Recent research has extensively studied and documented the economic and tourism relationship. For example, a study involving 12 Mediterranean countries demonstrated a bidirectional causal relationship between tourism development and economic growth (BILEN; YLANCE; ERYÜZLÜ, 2015). A more recent empirical analysis of this relationship (WIJESEKARA *et al*., 2022) employed panel data cointegration tests, Granger causality tests, and Wavelet coherence analysis on a global scale using data from 2003 to 2020 and arrived at a similar conclusion. Their results demonstrated that tourism can drive economic growth across all regions and vice versa.

In Portugal, Almeida (2023) focused on validating the Tourism-Led Growth Hypothesis in the case of the Madeira Islands. Through a quantitative approach, the study identified a causal link confirming the tourism sector as a driving factor of gross domestic product (GDP) growth, affirming a long-term

relationship between tourism and economic development.

The relationship between the economy and religious tourism, including pilgrimages, is complex but significant for local development. The greater circulation of people in territories promotes new jobs and income opportunities, infrastructure improvements, and new service offerings. These economic dynamics potentially benefit both pilgrims and the region's inhabitants (ALMEIDA; ENOQUE; OLIVEIRA JÚNIOR, 2020; DUARTE; HEITOR, 2023).

We can identify research focused on phenomenological interpretation, which seeks to find answers to the motivations for visiting sacred places (SHERENI; MUTANA-SIMANGO; GANGO, 2023), but also other quantitative empirical studies that are dedicated to understanding the influence of certain variables on a given economic panorama, such as evaluating positive and negative socio-economic impacts on a religious festival (NAIR; BABU, 2022). Other research investigates the relationship between the country's economic reality, based on socio-economic variables such as GDP, unemployment or globalization, and Catholic religious tourism (BELUCIO *et al.*, 2020) and the entrepreneurial activity of a region (GAUTAM, 2023).

In this sense, this paper aims to assess the influence of economic determinants on a particular manifestation of the phenomenon of the Catholic faith. A secondary database was built to answer this objective. Economic statistical data from 2008 to 2022 were obtained from World Bank Indicators. For the same period, data on the number of international pilgrims were obtained from the Shrine of Fátima website. The transport costs were estimated through Google Flights.

The dependent variable of this study (the one that the independent variables will explain) is the number of international pilgrims to the Shrine of Fátima. Five independent (economic) variables (those that explain the dependent variable) were selected: (i) transport costs, (ii) gross domestic product *per capita*, (iii) consumer price index a proxy of inflation, (iv) unemployment, and (v) a proxy of globalization.

Each independent variable provides relevant information on how economic determinants influence a phenomenon of faith (international pilgrimages to the Portuguese shrine). Therefore, the research hypotheses of this paper are:

a) the increase in income, measured through the gross domestic product *per capita*, has positive effects on the number of international pilgrims;
b) the increase in unemployment has negative effects on the number of international pilgrims;
c) the increase in transport costs, measured through the value of air tickets, has negative effects on the number of international pilgrims;
d) the increase in globalization, measured by the number of mobile phones, had positive effects on the number of international pilgrims,
e) the increase in inflation, measured through the consumer price index, negatively affects the number of pilgrims.

This paper proposes a relationship between faith and reason, in this case, economic sciences. We propose a brief framework to facilitate the multidisciplinary understanding of this approach. The framework goes through five main steps to show the relationship between the economy and a Catholic international pilgrimage (Figure 1).

Figure 1: Framework

After this introduction session, the organization of this paper follows this order: The data and the econometric method will be presented next. The following section will show the empirical results and discuss them. The last section is dedicated to the final considerations.

Data and Method

A database with secondary data was created with statistical information from 2008 to 2022. Data on international pilgrims were obtained from the Shrine of Fátima website. The transportation costs (FLI) were obtained through Google Flights. Finally, in the World Bank Indicators, it was possible to select the other economic variables: the gross domestic product *per capita*, the consumer price index, a proxy variable of inflation, unemployment, and the number of mobile phones, commonly representing globalization.

The number of pilgrims (PIL) is currently made available annually by the Shrine of Fátima. Fuinhas; Marques; Belucio (2017, p. 520-521) show the methodology used by the service of the Shrine (*Serviço de Estudos e Difusão)* to ensure consistency of statistical information. The first step in creating the database was to compile international statistics on the Portuguese shrine. Among the dozens of countries of origin of the pilgrims annually, only 29 countries have common data for the entire period under analysis (Australia, Austria, Belgium, Brazil, Canada, China, Colombia, Croatia, Germany, France, Hungary, India, Indonesia, Ireland, Italy, Japan, Malta, Mexico, Netherlands, Peru, Poland, Romania, Slovakia, Slovenia, Spain, Switzerland, Ukraine, United Kingdom, and United States).

In more recent years, due to the COVID-19 pandemic, some of these common countries of origin of the pilgrims did not have pilgrims, namely Australia in 2021, China in 2022, Slovenia in 2020, the Netherlands in 2020 and 2022, India in 2020 and 2021, Indonesia in 2021, Japan in 2020 and 2021, Malta in 2020, Peru in 2020 and 2021, and Romania in 2020. We calculated the average between the years available to overcome the gap and obtain a balanced database. It will also be possible to calculate natural logarithms to specify the model better. The value 0 does not allow the calculation.

An air ticket purchase simulation was carried out using the Google Flights tool in US dollars to obtain the transportation cost. The simulated travel period was from March 18, 2024, to March 24, 2024. Due to data limitations, the international pilgrims' city of origin is unknown. Only the country of origin is

available. For this reason, we chose to simulate trips that always depart from the countries' capitals to Lisbon.

Initially, the simulation preferentially included direct flights (non-stop). However, some countries of origin have long-term trips to Lisbon (Portugal), so the flight has at least one stopover. The countries whose flights have at least one stopover are Australia, Canada, China, Colombia, Croatia, Slovenia, India, Indonesia, Japan, Malta, Mexico, Peru, and Romania. The flights also included at least one cabin bag, given the unreasonable nature of making a pilgrimage abroad without luggage.

After obtaining the transportation costs for 2023, the effect of the consumer price index (CPI), a proxy variable of inflation for 2008 to 2022, was subtracted, assuming constant costs in real terms, to estimate transportation costs for each year of the period under analysis. Finally, with Russia at war against Ukraine, the Ukrainians have their airspace closed, making it impossible to estimate transport costs. This limitation was overcome using a triangulation between Moldova, Latvia, and Georgia capitals to appraise the cost of transportation from Ukraine.

Also, because of the war, the variables for mobile cellular subscriptions (per 100 people) (MOBILE) and total unemployment (% of the total labor force (UNE)) did not present data for Ukraine in 2022. Therefore, the average between previous years was calculated to overcome the gap.

Finally, to proxy domestic income, we use the gross domestic product *per capita* (GDPpc), at constant 2017 international dollars, converted to international dollars using purchasing power parity rates.

Table 1 below presents the descriptive statistics of the data. Descriptive statistics indicate that the constructed data panel was balanced. The letter "l" in front of the variables indicates that they were transformed into natural logarithms. The number of observations with variables in level is constant (435 observations), and after the first difference (D), they remain constant (406 observations). The balanced panel is essential for a good estimation of econometric models.

> Panel data models (or longitudinal data) can combine time series data with cross-sectional data; that is, they allow observing the behavior of N entities (e.g., countries, companies, individuals, among others) during a specific period *T* (years, months, semesters, quarters) (FUINHAS *et al.*, 2019, p. 139).

Table 1: Descriptive statistics

	Variables	Obs	Mean	Std.Dev.	Min	Max
Nivel	LPIL	435	6.661	1.807	1.609	11.150
	UNE	435	7.190	3.648	2.350	26.090
	LFLI	435	5.617	0.816	3.653	7.444
	CPI	435	116.006	28.357	78.900	380.318
	LGDPPC	435	10.289	0.659	8.216	11.643
	LMOBILE	435	4.711	0.198	3.359	5.121
1st differences	DLPIL	406	-0.029	1.134	-4.659	3.529
	DUNE	406	-0.071	1.182	-3.879	6.610
	DLFLI	406	0.028	0.044	-0.044	0.667
	DCPI	406	3.694	5.879	-4.732	63.871
	DLGDPPC	406	0.016	0.042	-0.188	0.209
	DLMOBILE	406	0.016	0.056	-0.319	0.401

The first characteristic to be observed in the data is the presence of unit roots. When a series has unit roots, there is a strong indication of non-stationarity. The difference transformation must be applied to solve the problem of unit roots (or non-stationarity). The differences are indicated by I(d), where "d" represents the order of integration (FUINHAS *et al.*, 2019, p. 86).

Table 2 below presents the panel unit root test (PESARAN, 2007). The test is given for variables at the level and after the first difference, in the presence of a trend variable and without the trend variable. Highlighted p-value statistics indicate the stationarity of the series. Only the LPIL and UNE variables are stationary. After the first difference, DLFLI, DCPI, DLGDPPC, and DLMOBILE show as stationary. This result suggests that the variables have two orders of integration: I(0) and I(1). Therefore, the panel estimation will have to be robust to this characteristic of the data.

Table 2: Panel unit roots tests

		Without trend			With trend			
Maddala and Wu (1999) Panel Unit Roots test (nivel)	**Variable**	**lags**	**chi_sq**	**p-value**	**Variable**	**lags**	**chi_sq**	**p-value**
	LPIL	0	-6.4	**0.0000**	LPIL	0	-6.3	**0.0000**
	UNE	0	-3.0	**0.0010**	UNE	0	-3.0	**0.0010**
	LFLI	0	0.5	0.6880	LFLI	0	3.4	1.0000
	CPI	0	0.8	0.8010	CPI	0	3.9	1.0000
	LGDPPC	0	-0.9	0.1750	LGDPPC	0	0.7	0.7720
	LMOBILE	0	1.5	0.9390	LMOBILE	0	0.5	0.6840
		Without trend			With trend			
Pesaran (2007) Panel Unit Root test (CIPS) (1st differences)	DLPIL	0	-14.7	**0.0000**	DLPIL	0	-11.2	**0.0000**
	DUNE	0	-7.5	**0.0000**	DUNE	0	-4.7	**0.0000**
	DLFLI	0	-2.7	**0.0030**	DLFLI	0	0.4	0.6590
	DCPI	0	-2.1	**0.0190**	DCPI	0	-0.2	0.4190
	DLGDPPC	0	-6.1	**0.0000**	DLGDPPC	0	-6.3	**0.0000**
	DLMOBILE	0	-6.2	**0.0000**	DLMOBILE	0	-4.7	**0.0000**

The Pedroni (1999, 2004) test verified the panel cointegration. Cointegration can be a problem for long-term estimations, so its verification is important, as it provides relevant information on the estimation technique to be used. Table 3 shows the results of the cointegration test on the panel dataset. The results confirm cointegration. This result suggests that an autoregressive distributed lag (ARDL) approach, as Pesaran and Shin (1999) proposed, is more appropriate.

Table 3: Panel cointegration test

Cointegrating vector: Panel specific						
Panel means: Included		**Kernel**: Bartlett				
Time trend: Not included		**Lags**: 2 (Newey-West)				
AR parameter: Panel specific		**Augmented lags**:1				
	nivel		**1st differences**		**1 lag**	
	Statistic	p-value	Statistic	p-value	Statistic	p-value
Modified Phillips-Perron t	4.8	0.0000	5.5	0.0000	5.9	0.0000
Phillips-Perron t	-11.1	0.0000	-6.9	0.0000	-8.6	0.0000
Augmented Dickey-Fuller t	-11.1	0.0000	-6.3	0.0000	-6.4	0.0000

The correlation matrix shows the degree of correlation between the variables in the panel. The correlation matrix can also indicate the existence of multicollinearity between the variables when correlations are close to 1 (FUINHAS *et al.*, 2019, p. 50). The results of the correlation matrix are presented in Table 4. The matrix is presented for the variables at the level and after the first

difference. Correlations with a statistical significance of 5% level were highlighted.

Table 4: Correlation matrix

	LPIL	UNE	LFLI	CPI	LGDPPC	LMOBILE
LPIL	1					
UNE	**0.4537***	1				
LFLI	**-0.3331***	**-0.3691***	1			
CPI	0.0461	0.0204	**0.1801***	1		
LGDPPC	-0.0038	-0.069	**-0.2701***	**-0.3449***	1	
LMOBILE	**0.1126***	-0.0342	**-0.2693***	**0.1100***	**0.3626***	1

	DLPIL	DUNE	DLFLI	DCPI	DLGDPPC	DLMOBILE
DLPIL	1					
DUNE	**-0.2966***	1				
DLFLI	0.0150	**0.1200***	1			
DCPI	**0.1968***	-0.0636	**0.5051***	1		
DLGDPPC	**0.3072***	**-0.5327***	**-0.1055***	-0.0804	1	
DLMOBILE	0.0824	-0.0802	0.0449	-0.0001	**0.1973***	1

The Variance Inflation Factor (VIF) statistic verifies multicollinearity between variables. Multicollinearity is a common problem in regressions, where variables have exact linear relationships. A high mean of the statistic indicates a multicollinearity problem between the variables. It is understood as a high value if the result is between 8 and 10.

Table 5 presents the statistical results for the level and first differences variables. The average for the level was 1.32; after the first difference, it was 1.35. These values are considered low. Therefore, it can be assumed that the proposed model does not have a multicollinearity problem.

Table 5: VIF statistics

Variable	VIF	1/VIF	Variable	VIF	1/VIF
LGDPPC	1.43	0.700	DLGDPPC	1.47	0.679
LFLI	1.39	0.719	DUNE	1.46	0.686
LMOBILE	1.32	0.755	DCPI	1.39	0.717
CPI	1.26	0.794	DLFLI	1.39	0.718
UNE	1.22	0.821	DLMOBILE	1.05	0.956
Mean VIF: 1.32			**Mean VIF: 1.35**		

Cross-sectional dependence is another potential problem in macro panels. If untreated, it can generate biased estimates. This paper presents a borderline panel spanning 15 years and 29 countries, i.e., between a micro and a macro panel. Cross-sectional dependence suggests countries are susceptible to the same economic, political, or environmental shocks.

In Table 6, we present the results of the cross-sectional independence test. The results show cross-sectional dependence in all variables. This finding is another indicator of the data that the panel ARDL is the best method for assessing the influence of economic determinants on a phenomenon of Catholic faith.

Table 6: Cross-sectional independence

Variable	CD-test	p-value	Corr	abs(corr)
DLPIL	43.02	0.0000	0.571	0.573
DUNE	31.69	0.0000	0.42	0.458
DLFLI	31.4	0.0000	0.416	0.478
DCPI	51.41	0.0000	0.682	0.688
DLGDPPC	49.5	0.0000	0.657	0.661
DLMOBILE	7.82	0.0000	0.104	0.269

Some model specification tests are necessary to indicate the best panel ARDL for the empirical analysis. The Hausman test null hypothesis (H0) is that the random effect model is appropriate. H0 of Modified Wald's test: sigma(i)^2 = sigma^2 for all I. H0 of Pesaran's test: residuals are not correlated. H0 of Friedman's test: residuals are not correlated. H0 of Wooldridge's test: no first-order autocorrelation. H0 Breusch-Pagan LM test of independence is that residuals across entities are not correlated. *** denotes statistical significance at a 1% level.

In Table 7, we present the results of the specification tests. The Hausman test shows that the fixed effects model is appropriate. The Wald test confirms that the panel has heteroscedasticity. A contemporary correlation was found using the Pesaran test. Fridman and Breusch-Pagan's LM tests indicate cross-sectional dependence. Finally, the Wooldridge test shows serial correlation in panel data.

Table 7: Specification tests	
Test	**Statistics**
Hausman (fixed vs. Random effects) test	42.33***
Modified Wald's test	103.43***
Pesaran's test	32.952 ***
Friedman's test	146.218 ***
Breusch-Pagan LM test	1688.698 ***
Wooldridge's test	120.527 ***

Results and discussion

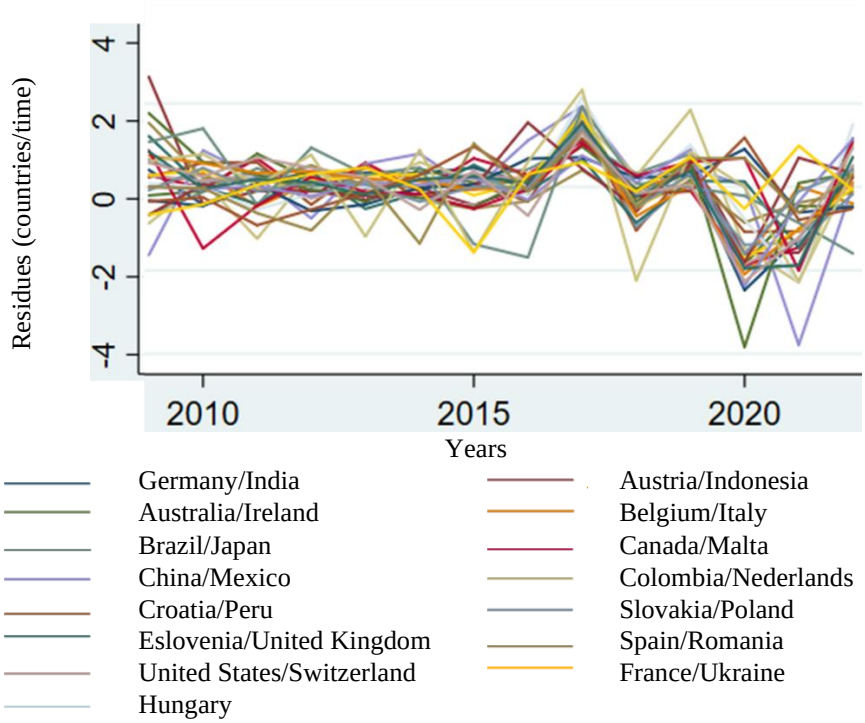
The equation (below) was estimated to answer the research problem:

$$DLPIL_{it}=\alpha_{1i}+TREND_{1i}+\beta_{11}DUNE_{it}+\beta_{12}DLFLI_{it}+\beta_{13}DCPI_{it}+\beta_{14}DLGDPPC_{it}+\beta_{15}DLMOBILE_{it}+\gamma_{11}LPIL_{it-1}+\gamma_{12}UNE_{it-1}+\gamma_{13}LFLI_{it-1}+\gamma_{14}GDPPC_{it-1}+\gamma_{15}LMOBILE_{it-1}+\varepsilon_{1it}$$

where α represents the constant, β are the estimated coefficients of the independent variables, and ε represents the error term. The subscripts "i" and "t" denote the time and country, respectively.

The equation residues were verified and are presented in Figure 2. The country with the positive outlier was Austria in 2009 (aus2009). The negative outliers were found in Ireland in 2020 (irl2020) and China in 2021 (chi2021), respectively.

Figure 2: Residues



The elasticities were calculated using the ratio between the variables and the LPIL coefficients; both lagged once, and the ratio was multiplied by "-1." We show the estimation results with dummies in Table 8.

Table 8: Estimation results with dummies

Dependente variable: DLPIL	**Coef.**	**Std. Err.**	**T**	**P>t**	**[95% Conf. Interval]**	
DUNE	-0.241	0.100	-2.420	**0.0310**	-0.456	-0.026
DLFLI	1.887	0.594	3.170	**0.0070**	0.603	3.171
DCPI	0.041	0.022	1.870	**0.0840**	-0.006	0.089
DLGDPPC	3.867	2.263	1.710	0.1110	-1.023	8.756
DLMOBILE	-0.510	0.942	-0.540	0.5970	-2.546	1.525
l_LPIL	-0.704	0.052	13.640	**0.0000**	-0.815	-0.592
l_UNE	-0.007	0.025	-0.290	0.7790	-0.062	0.047
l_LFLI	3.078	0.692	4.450	**0.0010**	1.583	4.574
l_CPI	-0.024	0.006	-4.040	**0.0010**	-0.037	-0.011
l_LGDPPC	2.161	0.688	3.140	**0.0080**	0.675	3.648
l_LMOBILE	1.674	0.306	5.460	**0.0000**	1.012	2.336
chi2021	-4.437	0.406	10.920	**0.0000**	-5.315	-3.560
irl2020	-4.258	0.413	10.300	**0.0000**	-5.151	-3.365
aus2009	2.061	0.163	12.620	**0.0000**	1.708	2.414
trend	-0.163	0.049	-3.350	**0.0050**	-0.268	-0.058
Constant	-38.951	6.790	-5.740	**0.0000**	-53.620	-24.282

Long-term results confirm that LFLI, LGDPPC, and LMOBILE positively influence the number of international pilgrims. The results also show that the CPI negatively influences the number of international pilgrims. Details of the statistically significant results can be seen in Table 9 (P>z value highlighted).

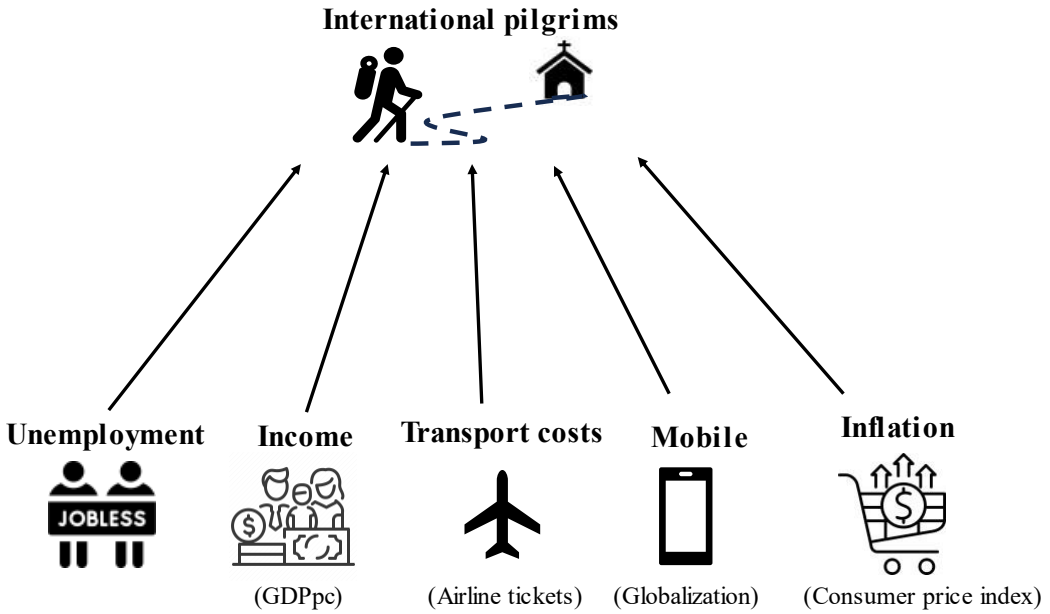
Table 9: Long-term elasticities and speed of adjustment

Long−run elasticities						
	Coef.	**Std. Err.**	**z**	**P>z**	**[95% Conf. Interval]**	
ratio1: -_b[l_UNE]/_b[l_LPIL]	-0.010	0.036	-0.280	0.7770	-0.081	0.060
ratio1: -_b[l_LFLI]/_b[l_LPIL]	4.375***	1.103	3.960	**0.0000**	2.212	6.537
ratio1: -_b[l_CPI]/_b[l_LPIL]	-0.034***	0.009	-3.700	**0.0000**	-0.052	-0.016
ratio1: -_b[l_LGDPPC]/_b[l_LPIL]	3.071***	1.027	2.990	**0.0030**	1.059	5.084
ratio1: -_b[l_LMOBILE]/_b[l_LPIL]	2.379***	0.449	5.290	**0.0000**	1.498	3.260
Speed of adjustment						
ECM = -0.704 ***						
Notes: *** denotes statistical significance at the 1% level; the ECM denotes the coefficient of the variable LPIL lagged once.						

In the short term, the proxies for income and globalization do not show significant statistics, and the unemployment rate (in the long term) also does not show significant statistics. Therefore, no conclusions can be drawn for the variables and periods mentioned. The lack of statistical relationship may occur due to factors such as the period under analysis for the group of countries under analysis.

Next, Figure 3 presents a brief resume of the econometric results. The figure indicates the parallel direction of short—and long-term influences.

Figure 3: Resume of results



Short-term	-		+		+
Long-term		+	+	+	-

Our model proposed that increases in the unemployment rate, consumer price index, and transportation costs would have a negative influence on the number of international pilgrims. On the other hand, we considered that increases in gross domestic product *per capita* and globalization would have a positive influence on the number of pilgrims.

The model shows that unemployment causes a decrease in pilgrimage in the short term. Previous studies corroborate this result, arguing that the risk of

the professional situation and the loss of employment cause people to be economically constrained, which causes consumer decisions to be restricted (BENITO, 2006; BRONNER; DE HOOG, 2011; EUGENIO-MARTÍN; CAMPOS-SORIA, 2014). It has been found that unemployed individuals are more likely not to spend on tourism activities (ALEGRE; POU; SARD; 2019; SUHEL; BASHIR, 2018), which include pilgrimages as a religious tourism activity (MOURAO, 2012). This suggests that limited access to financial resources during unemployment can reduce participation in international religious pilgrimages in the short term.

The results also confirm the positive relationship between income, as measured by GDP *per capita*, and the number of international pilgrims. This means that the number of pilgrims can be influenced by the income level of the travelers' country of origin, reflecting a greater financial capacity to participate in pilgrimages. In this sense, the results corroborate previous studies that identify an increase in demand for religious tourism when there is an increase in income in the pilgrims' countries (ALANZI; KULENDRAN; NGUYEN, 2023; BELUCIO; FUINHAS; VIEIRA, 2023). Therefore, economic development and pilgrimage activities have a clear connection. A country's economic growth may not only increase the number of pilgrimages but also positively contribute to religious tourism and its outcome for economic activity (TRIKI, 2019).

It is common knowledge that inflation and tourism impact each other (PEKTAS; UNLUONE, 2020). Our results showed that the consumer price index and the number of international pilgrims are related in the short term. The possible reason for the positive influence of our inflation proxy is the desire to travel and do leisure after the lockdown, which may have contributed to the increase in the number of pilgrims. After the critical period of COVID, there was the gradual lifting of restrictions that coincided with the period of large increase in inflation in most countries. Due to an initial investment, reservations, hygienic etiquette, or others, the pilgrims chose to maintain their program and fulfill the pilgrimage.

Religion is regarded by its followers as a component of social change (OKWUOSA; OKOLI, 2023), and faith is a component that can influence the

decision to go on a pilgrimage, even in difficult times, including rising prices. In the long run, a situation of continuous inflation tends to have negative effects on tourism. The positive variation in the consumer price index may reflect reduced interest in general consumption and pilgrimages, indicating that people, including those with faith, leave or substitute certain practices due to lower purchasing power.

The results indicate that transport costs and the pilgrims' decisions to carry out their religious activities move on similarly. Strong spiritual and emotional motivations drive pilgrimages. The pilgrims develop a deep connection with sacred places, seen as extensions of themselves, fostering feelings of belonging and dependence due to their uniqueness and sacredness. This motivates them to visit repeatedly and to increase their knowledge of these sites as symbols of the sacred (SILVA *et al.*, 2023). Therefore, results suggest that the pilgrims try to travel regardless of transport costs. However, alternative explanations for this positive association require further theoretical exploration. For example, it could be because prices (and the number of pilgrims) significantly increased after COVID-19, and both decreased during that period. Alternatively, it could be a case of demand pressure leading to an 'inverse' causality, where an increase in the number of pilgrims boosts the demand for airline tickets, thereby increasing their prices. Finally, the search for Portugal as a destination for sun and sea, culture and gastronomy can attract visitors, which can also increase prices.

Analyzing the effects of globalization on the number of international pilgrims to the Shrine of Fátima, there is a positive long-term influence. Globalization allows for better information about the destination and a higher capacity for planning, increasing pilgrimages to exercise faith. Our results align with Belucio *et al.* (2020), who explains that exchanging information makes it possible to promote the shrines more effectively as a place for pilgrimages and encounters with the sacred.

The strong relationship between the economy and *homo religiosus* was therefore confirmed for this panel of countries. The unidirectional relationship between the economy and the phenomenon of faith was verified, and the results

proved robust from an econometric point of view. The results corroborate the existence of dependence on economic factors for the practice of faith phenomena. In addition to Catholic pilgrimages, pilgrimages from other religions are expected to have the same dependence.

The results suggest a new problem about the relationship *homo religiosus vs*. economics, a new line of investigation for economic and religious science researchers. The research highlights the importance and influence of economics on the phenomena of faiths, religious practices, and the search for the sacred(s). A hypothesis that could also be verified in future research is whether faith practices, such as pilgrimage, have positive economic influences.

Final Considerations

This paper aimed to assess the influence of economic determinants on a phenomenon of the Catholic faith, international pilgrimages to the Shrine of Fátima (Portugal). In this sense, we analyze as determinants five variables: transport costs, measured through the value of air tickets; unemployment; income, measured by the gross domestic product *per capita*; globalization, proxied by the number of mobile phones; and inflation, measured through the consumer price index.

A panel of data from 2008 to 2022 for 29 countries of origin of international pilgrims was constituted. The nature of the variables indicated that a panel ARDL would be the most robust model for researching the proposed problem. The results partially respond to the proposed hypotheses, i.e., not all hypotheses were verified for the short and long term, only for one partially accepted period. The only exception was the hypothesis related to transportation costs, which presented the opposite result to what was initially expected.

Regarding the econometric results, a positive long-term relationship was found between the increase in average national income and the number of international pilgrims. As the long-term income growth rate increases, the population has access to new forms of tourism and leisure. Moreover, international destinations become more attractive options, not only for religious

people but in general. In this way, the Shrine of Fátima (and Portugal) becomes an alternative destination for many, and given the importance of Marian religious tourism, the city of Fátima gains prominence among religious people.

The increase in unemployment in the short term negatively affects the number of international pilgrims. The result indicates that as more components of society lose their means of subsistence (increase in unemployment), one of the first "give-ups" will likely be an international trip (even if for religious purposes).

The variable representing transport costs influence the number of international pilgrims with a positive sign. This finding is an unexpected result but also with a robust theoretical justification. For pilgrims, the path and destination are so important that the price of transport does not have a priori effect on their decision to pilgrimage. Even with increased transport costs, the number of pilgrims will be positively influenced. Here we see the factor of devotion and faith intrinsic to most Catholic pilgrims who do not choose to save money but rather to go on pilgrimage, fulfilling (in part) what is presented in the Bible "*Não podeis servir a Deus e ao Dinheiro*" [You cannot serve God and money] (BÍBLIA, 2013. p. 1714), probably due to the Fear of the Lord that makes people prosper (BÍBLIA, 2013) making or fulfilling a promise, or out of simple Mary devotion.

This result also confirms the Shrine of Fátima's strength in attracting international pilgrims. It indirectly highlights that Portugal can manage international religious tourism well.

The proxy to inflation has negative effects on the number of pilgrims. The result indicates positive effects in the short term and negative effects in the long term. The low coefficient indirectly reveals that the inflation proxy targets of the countries of origin are positive and controlled, suggesting economic stability that consequently allows the population to "dream" about international tourist destinations. Furthermore, it encourages religious people to go on pilgrimage.

The proxy of globalization positively affected the number of international pilgrims (in the long term). As more people access information, some tourist

destinations are expected to become more prominent. Catholic shrines are famous for presenting distinct architecture, countless works of art, and the enclosure as a place of spirituality. Therefore, our results suggest that as people have more access to information, the more they go on pilgrimages.

Regarding the barriers and limitations of this article, it is worth mentioning the lack of data on Catholic shrines. Few shrines are concerned with working with/making the data available. This situation limited the sample since data on the independent variable (number of international pilgrims) started in 2008. Still, the Shrine of Fátima is one of the few that has a studies department that collaborates with researchers from different areas that can benefit academic production.

Only the effects of economic variables on the phenomenon of faith (international pilgrimage) were analyzed. Thus, the feedback relationship, i.e., the effects of the phenomenon of faith on the economy of Fátima, was not verified. However, this relationship is interesting in the literature of religion, economics, and tourism economics. This information can contribute to stakeholders by showing the size of the impact of pilgrimages on the local economy. Due to data scarcity, sanctuary cities with microeconomic data can be an excellent case to study.

Finally, it is important to note that due to the COVID-19 pandemic, there were some limitations regarding the statistical data presented in the data and methods section. For countries that did not have statistical data for one or two years, we calculated the average between the years available to overcome the gap and obtain a balanced database. However, the econometric results were robust even with the limited data for some countries.

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