

# CAUSALITY BETWEEN FDI IN REAL ESTATE AND TOURISM GROWTH: COUNTY-LEVEL DATA FROM CROATIA

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**Abstract.** Croatia is a developed tourist destination that is overly dependent on tourism. Looking at the Croatian economy, the first thing that catches one's eye is the role that tourism plays in its structure. It is a frightening fact that tourism generates almost a quarter of Croatia's GDP. Tourism in Croatia has been growing steadily for years, and before the COVID-19 pandemic, Croatia began to face the problem of over-tourism. The real estate market in Croatia is also recording continuous rates of price growth, especially with regard to the attractive coastal region. Foreign direct investment (FDI) in real estate in Croatia became significant during the second decade of the 21st century, and today real estate is in second place if one looks at the structure of FDI in Croatia according to the National Qualification of Activities. In the last 10 years, real estate has accounted for 17.8% of all FDI in Croatia. Given the attractiveness of Croatia as a tourist destination, it is not surprising that its real estate market draws attention. The main goal of this paper is to determine the causal link between FDI in real estate and tourism at the level of Croatian counties in the period from 2007 to 2020. The research results found the existence of a one-way causal relationship running from international tourist arrivals to FDI in real estate at the 5% level of significance.

**Keywords:** FDI in real estate, tourism growth, Croatia, panel Dumitres & Hurlin.

**JEL Classification:** F21, Z32, C33

## 1. Introduction

FDI in services has become more significant over the last two decades following the privatization and liberalization policies of numerous countries (UNCTAD, 2009). Real estate is a special type of service according to its fundamental characteristics such as heterogeneity, location connectivity and high transaction costs. As He and Zou (2010) stated, the lack of international real estate trade is offset by increased FDI in real estate, international development projects and multinational real estate.

FDI in real estate includes inflows from both individuals and foreign companies (Boers,

2017). As far as FDI in real estate is concerned, it is expected to grow globally (Topintzi et al., 2008). The main reason for this is real estate market liberalization in many countries (UNCTAD, 2017). FDI in real estate has been one of the fastest growing sectors in recent years (Hui & Chan, 2014). This is supported by the fact that, after the onset of the global financial crisis in 2008, it increased worldwide (Gök & Akseki, 2020). According to Myles (2022), cross-border investments in European real estate are expected to reach record values this year. The statement of PwC (2022) could further support this: "From the investment perspective, the real estate market as a whole has proved to be resilient in times of a large economic crisis, which will lead to larger capital inflows in the next three to five years".

In the conditions of globalization, tourism has become the backbone of the global economy and all analyses indicate the further growth of its strength. According to the UNWTO (2020) and data from before the beginning of the COVID-19 pandemic, international tourist arrivals rose globally by 4% in 2019 and reached the level of 1.5 billion individuals. It is also interesting to point out the pre-pandemic economic strength of tourism, which according to the WTTC (2020) amounted to 10.3% of global GDP, 10.4% of total global employment, and one in four newly created jobs.

The link amongst FDI in real estate and the development of tourism is a modestly explored research topic (Fereidouni & Al-mulali, 2014; Ramdhany et al., 2021). The fact is that the tourism and real estate sectors are two components of the economy with high benefits and strong correlations in the tertiary sector (Sun & Fu, 2018). According to Tsai et al. (2015), the real estate and tourism sectors can have a synergistic effect of improving the image of the destination. The real estate sector can increase real estate values through tourism and surrounding facilities, while real estate development can result in a better tourist environment (Zhu, 2005). By engaging in international tourism, potential investors gain direct experience and information about potential investment opportunities (Gholipour & Al-mulali, 2014). Research to date has identified tourism as a very important factor influencing FDI in real estate (Gholipour & Masron, 2011; Gholipour, 2013; Hui & Chan, 2014; Rodríguez & Bustillo, 2010). Most research dealing with the causality issue found a causal relationship running from tourism to FDI in real estate (Gholipour et al., 2010), or a two-way causal relationship between these variables (Gholipour & Al-mulali, 2014; Gopy-Ramdhany et al., 2021). All of this mentioned research mainly focuses on the potential positive consequences of the causal relationship between tourism and FDI in real estate, ignoring negative aspects.

Both FDI in real estate and tourism itself have a very important place in the Croatian economy. Croatian tourism has been growing continuously for many years and has recorded a current growth rate of 9%, approaching the figure of 11 million tourist arrivals. It is a most propulsive area of the Croatian economy. Bearing in mind the attractiveness of Croatia as a tourist destination, it is not surprising that from 2007 to the present, FDI in real estate in Croatia has recorded a continuous growth rate of 26.4% (Croatian National Bank, 2022). FDI in real estate is currently in second place in the overall structure of FDI in Croatia. For comparison's sake, FDI in tourism ranks 7th (Croatian National Bank, 2022). Consequently, the main goal of this research is to explore the causal relationship between FDI in real estate and tourism using panel analysis at the level of 20 Croatian counties in the period from 2007 to 2021. To the author's knowledge, no scientific research has addressed the issue of causality amongst FDI in real estate and tourism

in Croatia. At the same time, no research so far has interpreted the direction of causality between tourism and FDI in real estate from a potential negative point of view. Instead, such results have automatically been considered excellent indicators of the need to further develop tourism in order to attract FDI in real estate. Here, the author recognizes the research gap that this paper will try to bridge, because FDI in real estate can also have negative consequences which should be kept in mind when interpreting the causal relationship. This is the first contribution of this research.

Moreover, and as a second contribution of this paper, it is necessary to highlight how previous research on the relationship between FDI in real estate and tourism has not included cross-sectional dependence testing and slope homogeneity issues in the panel model, which is crucial for the reliability of research results. According to Andreß (2017), with panel data, the chronological order of the possible causes of a particular effect is known through repeated measurements at the individual level, meaning that cause-and-effect conclusions and the political implications arising from them are much better grounded. Moreover, panel data allows testing a number of important economic questions to which time series or cross-sectional data cannot provide answers (Chuang & Wang, 2009).

To the author's knowledge, there is no research on the topic in question that has dealt with data at the county level, and this is the third contribution of this paper. In the case of Croatia, this is particularly significant as there are large differences between counties in terms of tourism development. In the end, considering the dynamics of the growth rate of FDI in real estate in Croatia and the strong growth rate of tourism, which is presenting Croatia with the problems of over-tourism, these research results have significant and broad socioeconomic and ecological implications. This is the fourth contribution of this work, because the obtained research results require a quick response from the holders of political power. It is certain that there is a serious threat of excessive tourism development in Croatia, and a threat to the standards of living of the local population due to the high level of FDI in real estate.

Research activity aimed at questioning the relationship between tourism and FDI in real estate is more than modest, but often ignores the potential negative aspects of research results finding causality between tourism and FDI in real estate. Such research has also not been carried out on the example of Croatia, all of which justifies the purpose of this research.

The subsequent section provides a literature review of the relationship between FDI in real estate and tourism. Section 3 describes importance of tourism and FDI in real estate for the Croatian economy. The data, empirical approach, and results and discussion of the empirical study are elaborated in Section 4. Lastly, concluding remarks as well as policy implications can be found in Section 5.

## **2. The state of the art: the relationship between FDI in real estate and tourism**

The power of FDI in the development of the economy is a thoroughly investigated scientific topic to which decades of research have been devoted. Interestingly, regardless of the power that tourism has in the global economy, the links amongst FDI and tourism have been explored to a lesser extent (Sanford & Dong, 2000; Endo, 2006; Tang et al., 2007; Craigwell & Moore, 2008; Bezić et al., 2010; Salleh et al., 2011; Zhang et al., 2011; Katircioglu, 2011; Othman et al., 2012; Selvanathan et al., 2012; Samimi et al., 2013; Fereidouni & Al-mulali, 2014; Perić & Nikšić Radić,

2016; Bezić & Nikšić Radić, 2017). The importance of FDI in tourism is of particular importance for developing and less developed countries (Chen & Devereux, 1999; Shehadi, 2017). However, the connection between FDI in tourism and tourism itself is still relatively poorly researched (Bezić & Nikšić Radić, 2017). The beginnings of research on this topic can be found in the work of Dunning and McQueen (1982), which investigated the effects of foreign-owned hotels. The results of their research showed that these effects are closely related to numerous factors of tourism in the host country, but also to the very nature of the corporation's operations. During the 1990s, the unexplored nature of the subject started to be emphasized (Sinclair & Stabler, 1991; Zhang, 1999; UNWTO, 1999). Research that followed mostly related to the testing of the causal relationship between tourism and FDI in tourism (Salleh, Othman, & Sarmidi, 201; Bezić & Nikšić Radić, 2017). Consequently, the connection amongst FDI in real estate and tourism, as noted earlier, is an even scarcer area of research.

Economic research points to the undoubted fact that FDI in real estate, like any other form of FDI, may add to the economic progress of the host country by stimulating the inflow of additional financial resources, transferring knowledge, skills and technology, creating jobs, etc. An analysis of the potential effects of FDI in real estate on the host country indicate a very wide range of both positive and negative effects (Swarbrooke & Horner; 2004; Wei et al., 2006; Basu & Yao, 2009; Fung et al., 2006; French, 2015; Rodríguez & Bustillo, 2010; Gholipour & Masron, 2013; Kim et al., 2015; Wortman et al., 2016; Paris, 2017; Li et al., 2021). It seems most important to point out that, on the one hand, FDI in real estate contributes to the revitalization of especially rural areas and affects the growth of tourism, because tourism is the next step after acquiring real estate in a foreign country. On the other hand, it brings the marginalization of the local population and an increase in real estate prices. Worsening housing affordability for domestic residents and high demand for real estate has led to overdevelopment in some parts of the Mediterranean.

Regarding the mere observation of the connectivity amongst FDI in real estate and tourism development, it is interesting to note that, to the author's knowledge, such research can only be traced back to the early 21st century, as shown in Table 1.

**Table 1.** *Empirical evidence on FDI in real estate and tourism development*

AUTHORS	SAMPLE/PERIOD	METHODOLOGY	RESULTS
Jiménez, 2002	Spain, 1967–1998	Three Stage Least Squares	Simultaneous and direct interdependence of revenues from tourism and FDI in real estate.
Rodriguez & Bustillo, 2008	Spain, 1990–2077	Engle and Granger cointegration regression	Tourist agglomeration in the host country is a significant and important determinant of FDI in real estate.
He et al., 2009	Chinese provinces, 1997–2007	Tobit model and spatial econometric analysis	Tourism has a positive impact on FDI in real estate.

He & Zhu, 2010	35 major Chinese cities, 2002–2008	Fixed effects panel model	Tourism is an important determinant of FDI in real estate.
Gholipour et al., 2010	Dubai	Vector Error Correction Model	Tourism has a long-term impact on FDI in real estate.
Gholipour & Masron, 2011	19 OECD countries, 1999–2008	Fixed effects panel model	There is a positive and significant connection between tourist agglomeration and FDI in real estate.
Gholipour & Al-mulla, 2014	24 OECD countries, 1995–2009	Panel Granger causality test	There is a long-term and two-way causal link between FDI in real estate and international tourism.
Gholipour, 2013	Panel of 14 Malaysian states, 2004–2010	System Generalized Method of Moments (GMM)	Tourist agglomeration is an important determinant of FDI in real estate.
Hui & Chan, 2014	Chinese provinces, 2005–2010	Fixed effects panel model	Tourism is not an important determinant of FDI in real estate.
Poon, 2017	UK (London), 1987–2015	Fixed effects panel model	The impact of tourism on FDI in real estate has been recognised as statistically insignificant, but has a high negative value.
ÅzÅ°T, 2019	Turkey, 2003–2018	DOLS-FMOLS estimator model	Tourism has a negative impact on FDI in real estate.
Wong et al., 2019	Australia, 2002–2013	Predictive quantitative design	Wealthy Asia-Pacific investors, both foreigners and tourists, invest heavily in the Australian residential real estate market due to Australia's well-known favourable living conditions and education standards.
Baguisi, 2020	Philippines, 1991–2018	Vector Error Correction Model	Tourist agglomeration leads to higher levels of FDI in real estate.
Gök & Akseki, 2020	Turkey, 2003–2016	Vector Error Correction Model	The number of one-year lagged tourist arrivals is one of the most important and statistically significant determinants of FDI in real estate in Turkey.
Gopy-Ramdhany et al., 2021	33 countries, 2000–2016	Panel Vector Error Correction Model	FDI in real estate has a generally positive impact on tourism growth. Tourism has a positive impact on FDI in real estate (at least in the long run).

**Source:** *Author's research*

An overview of existing research points to two main approaches to the theme of the connection between FDI in real estate and tourism. One stream of research looks at tourism as a potential determinant of attracting FDI in real estate (for example, Rodriguez & Bustillo, 2008; He and Zhu, 2010; Gholipour et al., 2010; Baguisi, 2020). Another stream of research approaches the problem in a manner similar to this paper – i.e., observes the causal relationship between FDI in real estate and tourism (Gholipour et al., 2010; Gholipour & Al-mulali, 2014; Gopy-Ramdhany et al., 2021).

A review of previous research makes it quite certain that FDI in real estate is influenced by tourism. According to Karadag (2021), when a foreign investor is considering the decision to invest in real estate, they usually invest on the coast of a country with a mild climate, affordable transportation, and natural, historical, and cultural beauty. The direction of causality between these two observed variables can be perceived as an open question (Gholipour et al., 2010). Most existing research points to the fact that tourism causes FDI in real estate (Rodriguez & Bustillo, 2008; Gholipour et al., 2010; Gholipour, 2013; Baguisi, 2020; Gök & Akseki, 2020), but a number of studies have demonstrated the existence of a two-way relationship amongst the observed variables (Jimenez, 2002; Gholipour et al., 2010; Gholipour & Al-mulali, 2014; Gopy-Ramdhany et al., 2021).

Existing research dealing with causality has not provided an unambiguous answer, so the question of the direction of this causality is one that requires further study. What is more certain in the specific country that is the subject of research – FDI in real estate-led tourism, or tourism-led FDI in real estate? Reflecting on the results of previous research, it is quite certain that in countries where tourism is still developing, FDI in real estate provides a positive impetus and can play a significant role in the further development of tourism. FDI in real estate has the potential to ensure the infrastructural development of tourism, which consequently results in the development of tourism (Gopy-Ramdhany, N. et al., 2021). However, is this the case for countries such as Croatia, which already have highly developed tourism? Is it good that tourism attracts FDI in real estate? Countries that are already developed as tourism destinations very often face the problem of over-tourism, and it is not in their interest to excessively attract FDI in real estate. FDI in real estate has a large impact on the environment, and is incompatible with the model of sustainable development (Barrantes-Reynolds, 2011) which every serious tourist destination strives to achieve in their long-term development. Tourism-developed countries are also very often faced with an enormous increase in real estate prices, which puts the local population in a perilous situation. FDI in real estate is associated with higher real estate prices in most capital-importing countries (Calvo et al., 1996), providing one more reason why it is not in their interest to excessively attract FDI in real estate. The very limited amount of research, paired with these arguments, clearly points to the need for further research into the causal relationship between FDI in real estate and tourism. Such research results have exceptional political implications and have wider socio-economic and ecological effects in the case of Croatia, which is the focus of this research.

### **3. The importance of tourism and FDI in real estate for the Croatian economy**

Croatia is a country whose heritage of tourist activity dates back to the time of the Habsburg

Monarchy. Today, tourism is the backbone of the Croatian economy. The strength with which it dominates the Croatian economy is truly frightening, as confirmed by the data in Table 2.

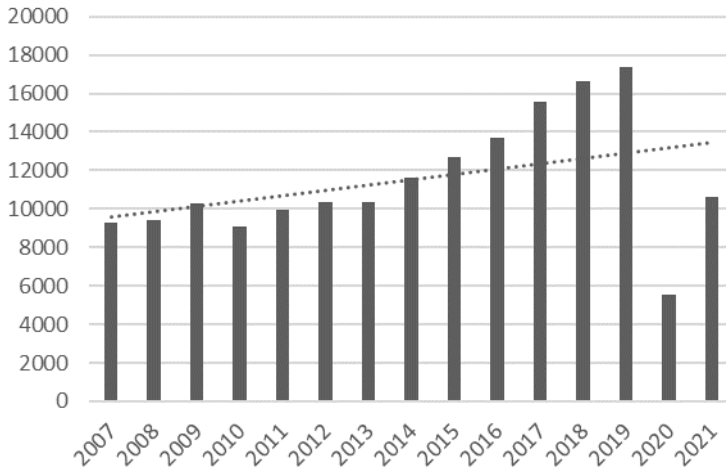
**Table 2.** *The strength of tourism in the Croatian economy*

	2019			2020		
	<b>Croatia</b>	<b>EU</b>	<b>World</b>	<b>Croatia</b>	<b>EU</b>	<b>World</b>
Contribution of travel & tourism to GDP	24.3% of total economy	9.5% of total economy	10.4% of total economy	10.2% of total economy	4.9% of total economy	5.5% of total economy
Contribution of travel & tourism to employment	22.2% of total employment	10.1% of total employment	1 in 10 jobs globally	19% of total employment	9.3% of total employment	1 in 11 jobs globally
International visitor impact	37.7% of total exports	6.2% of total exports	6.8% of total exports	18.1% of total exports	2.6% of total exports	6.8% of total exports

**Source:** *World Travel & Tourism Council (2021)*

Table 2 shows parallel data from 2019 and 2020 in order to highlight the importance of tourism more realistically, given the exceptional situation that affected the world globally during 2020. During 2019, the overall contribution of tourism to Croatia's GDP was 24.3%, while at the EU level it was 9.5%, and at the global level 10.4%. In the same year, tourism accounted for 22.2% of total employment in Croatia, while at the European and world level it accounted for around 10%. The situation is even more compelling when it is pointed out that in 2019 tourism accounted for 37.7% of total Croatian exports, while at the EU level it accounted for 6.2%, and at the global level 6.8% of total exports. During 2020, Croatia, like the rest of the world, recorded poorer tourism results, but regardless of this decrease tourism remained the dominant force in Croatia's economy.

It is interesting to note the trend of international tourist arrivals. Croatia, as a member of Yugoslavia at the time, recorded a record 10 million international tourist arrivals in 1985 (Gosar, 1989). After the disintegration of Yugoslavia and the Homeland War, it took a number of years for Croatian tourism to regain its former contours, and in 2000 it came somewhere close to pre-war levels. Croatia only re-achieved this record level of 10 million international tourist arrivals in 2009, as can be seen from Figure 1.

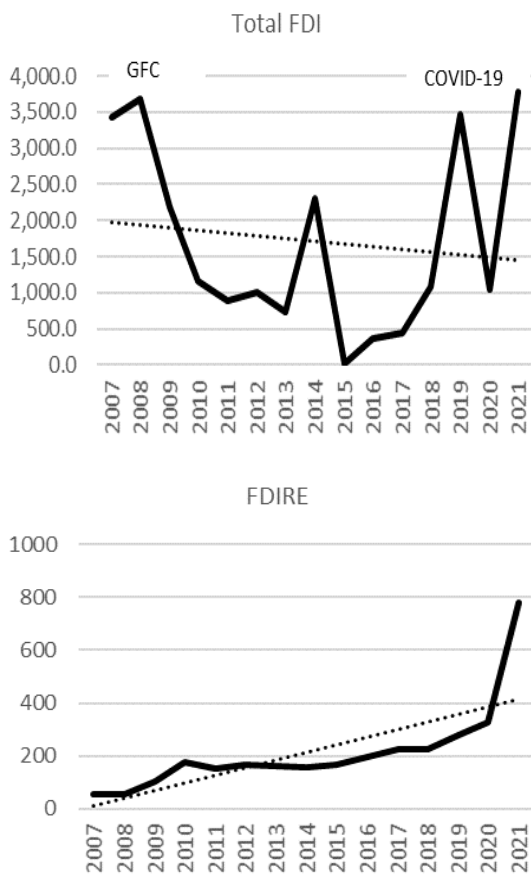
**Figure 1.** Croatian international tourist arrivals (in thousands), 2007–2021

**Source:** Croatian Bureau of Statistics (2011, 2022); Ministry of Tourism (2018)

The Global Financial Crisis caused turbulence in the intensity of tourism activity in 2008, but after that Croatian tourism continued to grow. In 2019, Croatia began to seriously deal with the issue of over-tourism when it achieved a record 17.4 million total tourist arrivals (Nikšić Radić, 2022). During the 2020 COVID-19 pandemic, Croatian tourism experienced a sharp decline, and 2021 ended with 10.7 million international tourist arrivals. In the observed period from 2007 to 2021, the average growth rate of international tourist arrivals was 9%.

It is also interesting to observe the trend in FDI in the Croatian economy. The official statistics of the Croatian National Bank have been monitoring the first inflows of foreign capital since 1993, and a significant growth trend can be traced back to 1995, when the Homeland War ended. The trend of FDI in the Croatian economy in the period from 2007 to 2021 reflects the situation of the global market, which can be seen in Figure 2.



**Figure 2.** FDI and FDI in real estate in Croatia, 2007–2021 (in million EUR)

**Source:** Author's calculation according to data from the Croatian National Bank (2021)

It is possible to see how Croatia managed to achieve a record level of FDI just before it faced the consequences of the Global financial crisis, and the next strong blow was dealt to it by the COVID-19 crisis in 2020. At the end of 2021, Croatia again attracted a record amount of FDI that can be compared to levels before the onset of the Global financial crisis.

FDI in real estate in Croatia can be monitored only since 2007. It is evident that FDI in real estate in Croatia in the observed period continuously grew at an average rate of 26.4%. An extremely high growth trend was recorded in the last observed year. Such a trend is in line with

global market trends (see more in PwC, 2022).

## 4. Research methodology

### 4.1 Data

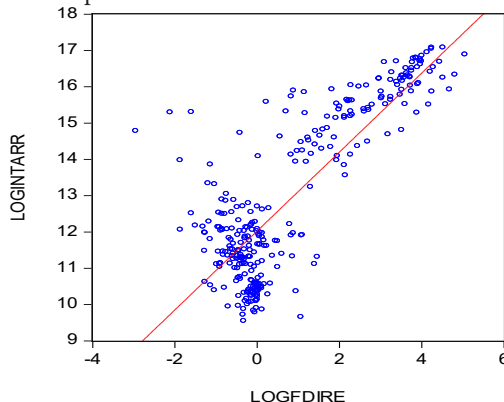
This research will use annual data related to the inflow of FDI in real estate and the number of international tourist arrivals. The data panel includes 20 counties and the capital of the Republic of Croatia: Zagreb, Krapina-Zagorje, Sisak-Moslavina, Karlovac, Varaždin, Koprivnica-Križevci, Bjelovar-Bilogora, Primorje-Gorski Kotar, Lika-Senj, Virovitica-Podravina, Pože-ga-Slavonia, Brod-Posavska, Zadarska, Osječko-Baranjska, Šibenik-Knin, Vukovarsko-Srijemska, Splitsko-Dalmatinska, Istarska, Dubrovačko-Neretvanska, Međimurska, and the City of Zagreb. The advantage of panel data is that they provide more explanatory data, greater variability, less collinearity between variables, a greater degree of freedom, and greater efficiency (Baltagi & Pesaran, 2007; Farzanegan & Gholipour, 2014). The data cover the period from 2007 to 2021. Table 3 shows the variables used in the study.

**Table 3.** Variables and sources

Variable	Definition	Source
LOGFDIRE	Inflow of FDI in real estate investments (in million EUR)	Croatian National Bank
LOGIN-TARR	Number of international tourist arrivals (in millions)	Croatian Bureau of Statistics

The statistical program EViews 12 will be used to conduct the panel analysis. The cross-sectional dimension ( $N = 21$ ) includes data for 21 counties, while the time dimension ( $T = 15$ ) covers 15 years. A scatter plot between these two variables is shown in Figure 3.

**Figure 3.** The relationship between international tourist arrivals and FDI in real estate



**Source:** *Author's calculations*

The scatter plot of international tourist arrivals and FDI in real estate shows the positive slope of the trend line.

#### **4.2 Empirical approach**

According to Lin (2008), testing causality among variables is both the most important and the most difficult issue in economics. Simply put, Granger causality analyses the flow of information between time series. More specifically, by investigating the causality between FDI in real estate and tourism, the author could potentially prove the following: FDI in real estate affects tourism; tourism affects FDI in real estate; there is no relationship between the variables; or there is a mutual relationship between FDI in real estate and tourism. The author employed the Dumitrescu and Hurlin causality test as a crucial test for making political decisions (Ahmed et al., 2022). At its core, this test examines whether there is a cause and effect bond between two observed variables (Yunusova, 2021). It is possible to highlight three advantages that it offers compared to existing methods: it takes into account cross-sectional dependence; the time dimension and relativity size of the cross-section is insignificant; and it achieves proficient results in an unbalanced panel (Lawal et al., 2022).

To the author's knowledge, previous research examining the causal link between FDI in real estate and tourism has not analysed cross-sectional dependence and slope homogeneity issues in panel analysis.

Cross-sectional dependence can be a serious issue in panel data, and its neglect can lead to misinterpretations (Grossman & Krueger, 1995). Cross-sectional dependence and slope homogeneity issues need to be tested before testing causality in panel models. These are two key steps in investigating the causal relationship in panel analysis (Dogru & Bulut, 2017). Cross-sectional dependence is described as the interaction between cross-sectional units. Due to spatial effects or spill over effects, cross-sectional dependence may occur or may be due to unnoticed (or inconspicuous) common factors (Baltagi & Pesaran, 2007).

In addition, before testing the unit root test and causality, this research starts with cross-sectional dependence testing. Establishing the occurrence or absence of cross-sectional dependence is essential to determining which unit root test will apply. The occurrence of cross-sectional dependence amongst counties will be assessed through the following tests: Breusch–Pagan (1980) LM; Pesaran (2004) CD; Pesaran (2004) scaled LM (LMS); and Baltagi, Feng and Kao (2012) bias-adjusted scaled LM (LMBC). The cross-sectional test hypotheses are as follows:

$H_0$  = *There is no reliance on the horizontal section.*

$H_1$  = *There is a dependency on horizontal section.*

Another important step is to examine slope homogeneity issues, which will be carried out through the Hsiao (1986) test. The homogeneity test is applied through panel analysis in order to decide whether other counties are equally affected by changes to one of the selected counties. The Hsiao (1986) test hypotheses are as follows:

$H_1$  = *Null hypothesis: panel is homogeneous vs alternative hypothesis:  $H_2$*

$H_2$  = *Null hypothesis:  $H_3$  vs alternative hypothesis panel is heterogeneous*

$H_3$  = *Null hypothesis: panel is homogeneous vs alternative hypothesis: panel is partially*

homogeneous.

The further research procedure requires stationarity testing. In panels where cross sectional dependence has been proven, it is appropriate to use some of the second generation unit root tests such as MADF (Taylor & Sarno, 1998), SURADF (Breuer et al., 2002), Bootstrap (Smith et al., 2004), PANIC (Bai & Ng, 2004), CADF and CIPS (Pesaran, 2007), and HK tests (Hadri & Kurozumi, 2012). This study will use the CADF test developed by Pesaran (2007). CADF testing is based on the contemporary modification of ADF regression with the first differences of individual series and average latency level cross-sections. In the test, individual results are obtained for each section with CADF statistics, and CIPS (Cross Sectionally Im-Pesaran-Shin) statistics are extended by taking the average of the section. Results are thus obtained for the entire panel. CADF panel unit root tests have substantial size and power even if  $N$  and  $T$  are relatively small (Dogru & Bulut, 2018). The CADF hypotheses are as follows (Pesaran, 2007):

$H_0$ : The variable is not stationary.

$H_1$ : The variable is stationary.

The presence of a causal relationship will be observed by the Dumitrescu and Hurlin (2012) panel causality test. Dumitrescu and Hurlin (2012) developed a panel causality test, the main features of which are: pondering both cross-sectional dependence and heterogeneity; giving homogeneous results in Eviews; giving effective results in unbalanced panel data sets when time is greater than horizontal dimensions ( $T > N$ ); and the ability to be used regardless of whether there is cointegration or not (Degerli, 2021).

The basic equation of the Dumitrescu and Hurlin causality test is as follows:

$$y_{i,t} = \alpha_i + \sum_{k=1}^L \gamma_i^k y_{it-k} + \sum_{k=1}^L \beta_i^k x_{it-k} + \varepsilon_{it}, i = 1, 2, \dots, N; t = 1, 2, \dots, T$$

where  $\alpha_i$  denotes individual effects,  $\gamma_i^k$  stands for the autoregressive parameters for each county,  $\beta_i^k$  denotes the regression coefficients for each county, and  $y_{it}$  and  $x_{it}$  indicate observables.

The null hypothesis versus the alternative hypothesis can be stated as follows:

$$H_0: \beta_i = 0 \quad H_1: \beta_i \neq 0$$

$$H_1: \begin{cases} \beta_i = 0 \\ \beta_i \neq 0 \end{cases} \forall i = 1, 2 \dots N \text{ and } \forall i = N + 1, N + 2 \dots N$$

### 4.3 Research results

The first step of the analysis was cross-sectional dependence testing, which plays a vital role in identifying and testing all phases for panel data. The existence or nonexistence of cross-sectional dependence is essential in deciding which unit root tests to apply. The test results are revealed in Table 4.

**Table 4.** The results of the cross-section dependence test

Variables	Breusch-Pagan LM	Pesaran scaled LM	Bias-corrected scaled LM	Pesaran CD
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logfdire	613.2367 (0.00)	19.67594 (0.00)	18.92594 (0.00)	7.421865 (0.00)
logintarr	1817.064 (0.00)	78.41667 (0.00)	77.66667 (0.00)	40.36628 (0.00)

Note: Figures in the parentheses are the probability values

The results of the cross-section dependence test show that the null hypothesis of no cross-sectional dependence was rejected at the 1% significance level. In other words, it is possible to conclude that there is cross-sectional dependence among the counties of the Republic of Croatia.

The next step was to examine the heterogeneity of the panels. When the economic forms of the considered counties differ, the coefficients in the model are expected to be heterogeneous. When their economic forms are similar, the coefficients will be homogeneous. The test results are presented in Table 5.

**Table 5.** The results of the Hsiao (1986) test

Hypotheses	F-stat	p-value
H1	159.9289	1.8E-166
H2	1.958107	0.009417
H3	298.3853	1.2E-181

$H_0$ : slope coefficients are homogenous

The results of the Hsiao homogeneity test show that it is possible to accept the assumption of heterogeneity by rejecting the homogeneity condition at the 5% significance level in all three hypotheses.

Given the proven cross-sectional dependency, it is appropriate to use second-generation unit root tests in further analysis. One such test is the CADF panel unit root test developed by Pesaran (2007).

**Table 6.** The results of the CADF panel unit root test (Pesaran CIPS Test Results)

	CIPS test results	p-value
logfdire	-0.95	>0.10
logintarr	-2.73	<0.01
dlogfdire	-3.59	<0.01
dlogintarr	-2.70	<0.01

The CADF panel unit root test results in Table 6 show that the null hypothesis of a root unit can be rejected when both variables are level. Both variables achieve stationarity after differentiation,  $I(1)$ . Consequently, when conducting the Dumitrescu and Hurlin (2012) panel causality test, the first differentiation of the subject variables will be used. The results of the Dumitrescu and Hurlin (2012) causality test are shown in Table 7.

**Table 7.** The results of the Dumitres and Hurlin (2012) causality test

Null hypothesis:	W-stat	p-value
$H_0$ : dlogintarr does not homogeneously cause dlogfdire	4.68	0.04*
$H_0$ : dlogfdire does not homogeneously cause dlogintarr	3.36	0.55

Note: \*Illustrates 5% statistical significance

The results of the Dumitres and Hurlin (2012) causality test show that the null hypothesis – no causality running from international tourism to FDI in real estate – can be rejected at the level of 5% significance. Furthermore, the results related to the null hypothesis – no causality running from FDI in real estate to international tourism arrivals – are not significant. In other words, it is possible to conclude that there is a one-way causality running from international tourist arrivals to FDI in real estate in the Republic of Croatia, observing the panel of its counties.

These research results are consistent with those of Rodriguez and Bustillo (2008), Gholipour and Masron (2011), Gholipour (2013), Baguisi (2020), and Gök and Akseki (2020). The development of Croatian tourism and its natural beauty, which make it attractive, influence the attraction of FDI in real estate. Nevertheless, while the mentioned previous research, the results of which are consistent with the results of this research, positively perceives the direction of causality from tourism to FDI in real estate, countries such as Croatia have to think about such trends in a different way. This is precisely why it is necessary to intensify research efforts in destinations whose enviable tourism results strongly attract FDI in real estate, which leads to negative effects in the country. For example, the research of Gholipour et al. (2010) focused on Dubai, where such results have a stimulating effect on the holders of political power who should recognize the opportunity and intensify efforts to attract additional numbers of tourists and thereby ensure the further attraction of FDI in real estate. However, these measures are not in the national interest in Croatia. On the contrary, such results send a signal to the holders of political power in Croatia to seriously deal with the issue of the strong growth of FDI in real estate. Large inflows of FDI in real estate are often associated with growing imbalances, such as rising real estate prices (Guerra de Luna, 1997; Brooks, 2017) and the increasing cost of land and housing (Copeland, 1991). Large amounts of FDI in real estate in Costa Rica (around 25% of total FDI inflows) contributed to the development of real estate prices (Cordero & Paus, 2008). For comparison, in 2021 FDI in real estate in Croatia amounted to 20.6% of total FDI inflows. According to Thomas (2021), real estate prices in Croatia have grown by more than 26% in the past 10 years or so.

Contrary to the results of this research, Poon (2017), using the example of England through the analysis of panel data, proved a negative connection between the number of tourists and FDI in real estate, but the reason for this is perhaps because these investments had the purpose of achieving financial profit. As far as FDI in real estate is concerned, Croatia is primarily attractive for other reasons. For instance, Croatia is proclaimed to be the eighth best country in the world to retire to, according to a survey from 2022 (Thomas, 2022). While the standard of living Croatian citizens is below the European average and the cost of living in their own country is extremely high for them, Croatia is, citing McMahon (2021) “insanely cheap for just about everything” for citizens of developed Western countries. The phenomenon of buying real estate in one’s favourite

tourist destination is particularly visible in Europe (Swarbrooke & Horner, 2004). This is a direct consequence of large differences in the standards of living of individual member states. Real estate has become both global and local: global because it is of interest to global corporations; and local in terms of micro location factors that have a profound impact on values (Norges Bank, 2015; Reiss, 2002; Bardhan & Kroll, 2007). The link between the global real estate industry and a country is “a state-building force in some respects and a state-destroying force in others” (Harrington, 2016; Rogers & Koh, 2017).

Finally, such research results should also be considered from the aspect of sustainability in Croatia's case, because Croatia is a country facing the serious problem of over-tourism. Similar previous research has not considered these results from this very important aspect. Real estate affects the accomplishment of sustainability goals (Kabil et al., 2022), and it should be strongly pointed out that these research results represent a severe threat to the sustainability of Croatian tourism, which is already seriously damaged.

## 5. Conclusion

It is quite certain that the phenomenon of buying real estate abroad is a trend that will continue to grow around the world in the future (Swarbrook & Horner, 2004). This is a consequence of the increasing growth of international tourist arrival numbers, which very often results in the purchase of real estate in a foreign country – a country previously visited for tourist reasons. In addition, some investors consider real estate investments to be a safe haven in times of great uncertainty (European Systemic Risk Board, 2022). As Rogers and Koh (2017) stated, FDI in real estate is once again becoming a key issue in political, scientific and public debates.

The Croatian economy and tourism, unlike many of Croatia's competing tourist destinations, are two extremely dependent concepts. Tourism accounts for approximately 25% of Croatia's GDP, and the country has a serious problem with over-tourism. Croatia is an attractive tourist destination and of course draws global attention with its real estate market. In the last 10 years, FDI in real estate accounted for 17.8% of all FDI in Croatia, and today FDI in real estate is in second place if one looks at the total structure of FDI in Croatia.

The research results in this paper unequivocally indicate the existence of a one-way causality running from international tourist arrivals to FDI in real estate at the 5% level of significance. Given the continuing strong growth rate of international tourist arrivals of 9%, such results are in line with previous research results that clearly point out that tourist visits often result in later investments in the visited destination (Rodriguez & Bustillo, 2010; Gholipour & Masron, 2011).

Although previous research suggests that when tourism affects FDI in real estate policy-makers should pay special attention to their tourism sectors and try to attract additional international tourists to advance their real estate sectors (Gholipour & Masron, 2011), it is very questionable whether there is a need to attract additional international tourists to Croatia. Given that Croatia is a country facing a major over-tourism problem due to its extreme seasonality, which is a direct consequence of the specific structure of Croatian accommodation, (Nikšić Radić, 2022) the additional attraction of FDI in private accommodation would put an even heavier burden on Croatian tourism and would remove it even further from the aspiration of sustainable tourism development. In Croatia, if the representative year 2019 is observed, significantly reduced seasonality can be noticed only in hotel accommodation (Nikšić Radić, 2022). Croatia can benefit

only if it successfully corrects its extremely seasonal tourist image.

Countries that rely heavily on tourism, and especially on international tourist arrivals, are usually small, have a GDP per capita in the middle- and high-income range, and are mostly net debtors (Milesi Ferretti, 2021). It is interesting to note that there are actually studies that have proven that small countries specializing in tourism are more successful than other small countries (Braun et al., 2007). However, in the case of Croatia, previous experiences show that any global instability that directly reflects on tourism activity throws the Croatian economy, to which tourism contributes 25%, to its knees. According to Lee and Chien (2008), countries or areas that target tourism as a development strategy to secure domestic investment depend on foreign investment to ensure the success of the tourism sector. Nevertheless, warnings of the appropriate degree of connection between the two aspects have been heard for decades. In this vein, Davis (1967) pointed out how “Tourism, like other economic activities, flourishes best when it fits into a context of general economic policies and programs designed to lead to the optimum growth of the economy as a whole. For this, some sort of national planning – at least in setting priorities and seeing that they are emphasized – is required to create a climate for productive investment in all suitable fields. The adoption of a national tourism plan is probably the only most important step that each country can take to ensure a balanced investment program in tourism development”. It is quite certain that the current Croatian tourism plan, and consequently the development of Croatian tourism, is inconsistent with the rest of the economy. On the contrary, looking at the strength of Croatian tourism in relation to its overall economy, it is evident that tourism has been the only pillar holding up the Croatian economy for decades.

Although residential tourists contribute to the inflow of FDI in real estate and are expected to be more committed to a particular destination, large numbers of foreign investors and a high level of foreign control can also jeopardize the sustainability of the residential tourism sector (Wortman et al., 2016). Excessive development can lead to a decline in tourism, and a direct consequence of this may be the transfer of investors to other opportunities, leaving the local population with an overdeveloped and declining industry. Mihaljek (2005) pointed out that this potential problem could befall Croatia in 2005. Today, Croatian tourism is already facing a strong growth rate of international tourist arrivals, FDI in real estate, and the excessive development of tourism. Consequently, the long-term sustainability of its development is becoming more and more questionable. The holders of political power need to take very seriously such messages in the existing scientific literature, especially after the proven causal link that, in the Croatian example, proceeds from international tourist arrivals to FDI in real estate. Croatia's long-term goal should be to provide its citizens with the opportunity to acquire real estate in their own country and to ensure the sustainability of tourism, on which the entire economy rests. The current strong growth trends of FDI in real estate, stimulated by intensive tourism growth, put the possibility of realizing the necessary stated long-term goals into question.

These research results certainly indicate the importance of further research on the subject. It would be interesting to see which other determinants of the Croatian economy, in addition to tourism, affect the attraction of FDI in real estate. It should also be noted that the real estate market, due to the huge interest of foreigners in Croatia, is recording continuous growth rates in prices, especially in the attractive coastal area. This has far-reaching consequences for the local population. The effect of FDI in real estate on house prices is unquestionable, and is an area



requiring further research. Looking at the direction of causality running from tourism to FDI in real estate from a potential negative point of view is an imperative for the Croatian economy. Thus, the question must be asked: what is the ultimate limit of this need to attract FDI in real estate in each individual country?

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