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The effects of economic policy uncertainty on hotel performance: evidence from the Italian hospitality sector

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Abstract

Purpose – This study aims to investigate the effects of economic policy uncertainty (EPU) on Italian hospitality sector. The investigation attempts to explain whether hotel performance drops when the perceived economic uncertainty increases in the period 2018–2022.

Design/methodology/approach – The study examines the impact of EPU on hotel performance in a sample of 661 Italian luxury hotels. To establish the relationship between EPU and hotel performance, we employ the generalized estimating equations (GEE) technique on 3,305 hotel-year observations.

Findings – The results show that EPU has a negative impact on hotel performance. More specifically, the analysis reveals that EPU is negatively and significantly related to the revenue per available room (REVPAR), average daily rate (ADR) and hotel occupancy (OCCR). We also look at the role of hotel brand chain affiliation and the moderating effect of conference space and hotel wellness services on the relationship between EPU and hotel performance.

Research limitations/implications – Results provide new evidence for academics to critically evaluate the behavior of luxury hotels under uncertain economic conditions. The investigation offers valuable information also for government, tourism policymakers, tourist hotel owners, hoteliers and tourism managers in their decision-making.

Practical implications – This study provides strategic implications for practitioners and operators in hospitality industry to evaluate the factors ensuring hotel profitability in periods of EPU.

Originality/value – This paper provides interesting insights into the characteristics and practices of profitable hotels in Italy. Few econometric studies empirically explored the effects of EPU in the hospitality field so far and no prior study investigated this topic in the Italian hospitality sector. Therefore, this paper tries to close an important gap in the existing literature improving the understanding of EPU in the Italian hospitality industry.

Keywords Economic policy uncertainty, EPU, Hotel performance, Italian hospitality industry

Paper type Research paper

1. Introduction

Prior research has shown that economic policy uncertainty (EPU) has direct effects on markets' functioning, nation's economy and macro-economic indicators as well as on firms' investments and hiring behaviors (Ren *et al.*, 2019; Zhang *et al.*, 2015). The uncertainty of economic policy plays a key role for capital market participants because the governments' own investment and expenditures in an economy influence financial decisions and corporate investments at the firm level (Iqbal *et al.*, 2020). In an advanced economy, EPU is critical

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especially for companies' various strategic decisions (Brogaard and Detzel, 2015) since it may impose difficulties for decision making and affect performance. Hence, uncertainty strongly influences consumers' risk perceptions and consequently it changes their purchase decisions (Abaidoo, 2016; Carter and Moital, 2018; Lee *et al.*, 2019).

This phenomenon is especially evident in the hospitality sector whose firm-specific and business characteristics make it extremely sensitive to uncertainty. Since tourism and hospitality services are demand-elastic goods (Song *et al.*, 2010), the request of these products is probably significantly affected by EPU. It is commonly recognized that lodging sectors are influenced from economic fluctuations at a different degree. During periods of uncertainty, hotel operators should realize the changes in the market dynamics and predict what the perceived uncertainties hold for their operations in the economic environment. Moreover, under economic uncertainty, consumers and capital market participants tend to postpone their consumption to hedge themselves against the economic risks that may arise in the future. Therefore, in an uncertain economic environment, consumers are incline to cancel or defer their travel plans and hotel accommodations for the rising of more necessities such as food, shelter and health care (Gozgor and Ongan, 2017). Hotel services are typically classified as not priority goods and then they are easy to give up or to postpone under adverse economic conditions. Hence, a strong economic policy and a trusted economic environment are crucial for hotel properties' long-term performance. In tourism and hospitality research great attention has been devoted to macro-level indicators such as tourism expenditure, tourist inflows/outflows and total lodging demand (Dragouni *et al.*, 2016; Gozgor and Ongan, 2017; Ongan and Gozgor, 2018); otherwise the deep dive of the EPU effect on hotel performance at the business-level must be explored. In this paper, we extend the literature on EPU by investigating the effect of it on hospitality sector. Particularly, we pursue the following research questions: does policy-related economic uncertainty affect hotel performance in Italy? Based on the previous studies on uncertainty, we provide hotel-property level evidence as to how individual hotels perform under EPU conditions. Specifically, we explore whether luxury hotel demand (measured by revenue per available room, average daily rate and room occupancy) is affected by the consequences of EPU. Although there is a fast-growing literature on the impact of EPU on tourism demand (Demir and Ersan, 2018), there is still limited evidence on this effect at hotel-level. The study provides fresh insights regarding how EPU is related to hotel performance by examining its impact on 661 Italian luxury hotels for the period 2018–2022 with a total of 3,305 firm-year observations. The study finds a persistent negative effect of EPU on hotel performance.

This study contributes to the tourism research literature in several ways. First, using a specific cluster of hotels as unit of analysis, we extend the research on the effects of EPU on investments and operating performance at a firm-level in the tourism sector. Second, despite the greater emphasis on EPU in prior research, the knowledge of its effect in the hospitality industry is quite restricted. Most importantly, no studies in the literature have examined the relationship between EPU and hotel profitability in the Italian hospitality industry. Third, beside exploring the primary relationship between hotel performance and EPU, we also attempt to reveal how this assumed relationship operates under the attributes of the business model. By testing the effect of EPU on hotels, the study reveals valuable inputs for hotel practitioners to promote their hospitality services under increasingly uncertain periods.

The remainder of the paper is organized as follows. Section 2 provides the literature review and the research hypotheses. Section 3 describes the dataset, the sample, the variables and the methodology used in estimating the econometric model. Section 4 presents the descriptive statistics and discusses regression findings. Finally, Section 5 sets out the conclusions, limitations and implications of the study for future research.

2. Literature review

2.1 Theoretical literature on EPU

In economics, uncertainty refers to the inability to forecast what could happen in the future. The rise of uncertainty lowers economic actors' expectations for the future and widens the range of possible outcomes of forthcoming economic activities (Foerster, 2014). The recent literature has focused on the economic consequences of EPU, particularly for economy and firms (Aastveit *et al.*, 2017; Fontaine *et al.*, 2018). From a macro-economic point of view, EPU has a direct negative effect on GDP growth (Abaidoo, 2012; Ali, 2001) and it has implications for exchange rates volatility and domestic unemployment level, especially when the economies are not doing well. A significant number of studies showed that EPU is negatively associated with stock returns also (Brogaard and Detzel, 2015). For instance, some prior studies verified that stock returns are lower during periods of high uncertainty compared to periods with lower uncertainty in some countries (Pástor and Veronesi, 2012; Sum, 2013). Turning to microeconomics, EPU has significant effects on corporate policies, investments and risk-taking. This is consistent with the uncertainty literature in economy, which assigns a significant role to risk exposure and to related behavioral responses in times of uncertainty.

2.2 EPU in the hospitality sector

Prior literature has looked into the consequences of the financial crisis, terrorism, and political instability on hotel performance. Political instability – described as the possibility of an unexpected and substantial change in a nation's leadership, government policies, or general economic conditions – was found to have a substantial negative effect on tourism demand (Al-Shorman *et al.*, 2016). The number of studies inspecting the possible effects of EPU in the tourism sector has increased rapidly and economists outlined that economic uncertainty significantly affects the consumption behaviors in this industry (Gozgor and Ongan, 2017; Jiang *et al.*, 2022; Sheldon and Dwyer, 2010; Wu and Wu, 2019; Wu *et al.*, 2021). Nevertheless, the evidence on the relationship between EPU and firm-level performance in the hospitality context is quite limited (Lee and How, 2023a, b; Madanoglu and Ozdemir, 2018; Ozdemir *et al.*, 2022). In general, tourism industry is highly sensitive to economic circumstances, and particularly the consumption of tourism products is affected more severely than the consumption of other goods and services during economic cycles and political/social turbulences (Campos-Soria *et al.*, 2015; Elshaer and Saad, 2017; Ivanov *et al.*, 2017; Saha and Yap, 2013). In periods of economic and financial crisis, the demand for tourism products is reduced or postponed temporarily, resulting in the decrease of tourist arrival numbers and in the decline of tourism incomes (Afonso-Rodriguez, 2017; Hall, 2010; Mao *et al.*, 2010; Saha and Yap, 2013). Thus, it is plausible to expect that the demand for tourism products is significantly affected by EPU. According to these considerations, prior research has investigated the effects of various forms of uncertainty on tourism and it found negative impacts of EPU. In particular, empirical findings of previous studies found that EPU negatively affects tourism demand and corporate investments in tourism industry (Bronner and De Hoog, 2012; Campos-Soria *et al.*, 2015; Ghosh, 2019; Kosova and Enz, 2012). For example, García-Gómez *et al.* (2022) analyzed the impact of EPU on the performance of US tourism firms in the period of 2000–2018 and they verified that EPU has a negative impact on ROE, ROA and Tobin's Q. Likewise, Ozdemir *et al.* (2023) revealed that high EPU has a detrimental effect on Tobin's Q. Another stream of prior research documented that EPU periods have a direct effect on inbound and outbound tourism (Khan *et al.*, 2021; Kuok *et al.*, 2023). For example, Ghosh (2019) suggested that economic and political uncertainty adversely affected inbound tourists' expenditure in the United Kingdom, France and Greece. Especially for countries that are highly dependent on tourism income, EPU is an important determinant to attract tourists from abroad. In particular, prior literature verified that EPU

has a negative effect on tourist arrivals because visitors are sensitive to uncertainty (Chatziantoniou *et al.*, 2016; Chen *et al.*, 2020; Dragouni *et al.*, 2016; Işik *et al.*, 2020; Ongan and Gozgor, 2018). In this regard, when the level of uncertainty becomes significantly high, consumer demand for holidays abroad declines. For example, Gozgor and Ongan (2017) examined the impact of policy-related economic uncertainty on tourism demand aggregating tourism spending at the country-level as their unit of analysis and they reported that high EPU leads to substantial decrease in the domestic tourism spending in the long-run.

From a macroeconomic perspective, Balli *et al.* (2018) showed that both global and local EPU have negative impacts on tourism inflows. Also, Demir and Ersan (2017) revealed that high EPU negatively influences tourist expenditures. This negative impact is due to tourists' inclination to select travel destinations characterized by political stability and stable exchange rate regime over unstable ones. Therefore, uncertainties due to government policies might emerge as an additional source of risk for hotel firms, determining considerable volatility in hotel demand (occupancy) (Song *et al.*, 2011). Indeed, under increased economic uncertainty due to government policies and downward fluctuations in economic indicators, hotel occupancy could be negatively affected. For example, Madanoglu and Ozdemir (2018) stated that EPU has a negative effect on hotel operating performance (proxied by average daily rate, occupancy and revenue per available room) in the USA. Likewise, Chen *et al.* (2020) studied the Taiwanese hotel market and stated a significant decrease in room demand from Chinese and Japanese markets when EPU was high. Similarly, Lee and How (2023b) tested a negative impact of domestic EPU on hotel room demand in Singapore. Also Lee and How (2023a) investigated the effects of EPU and global financial crisis on the hotel room rates of two types of hotels (economy and luxury) and they found that EPU has a negative impact on the room rates of economy hotels but it does not affect the room rates of luxury hotels. Considering the majority of prior literature, we propose a rationale for the adverse relationship between EPU and hotel performance in Italy. This prediction is hypothesized as follows.

H1. There is a negative relationship between EPU and hotel performance

3. Methodology

3.1 Sample selection and data sources

In this study, we investigated whether EPU has any significant impact on hotel performance in the Italian hospitality industry. The sample is composed by luxury hotels identified with the five-star hotel category. The Italian hospitality sector is a large industry with global turnover estimated at € 22 billion in 2022. The five-star sector represents 28.5%, or a value equal to € 6.3 billion. In terms of number of structures, the five-star hotels in Italy are 668 in 2022, with a total of 44,768 rooms. This number represents 4% of the total rooms in the Italian hospitality sector. Italy is a country full of culture, art and history and the Italian beauties of its cities, villages and natural landscapes are a unique and priceless heritage in the world. Italy is one of the most praised countries for its attractions. The growth of high-end accommodation in Italy beats that of the overall market. In particular, the market of luxury hotels rose by 7% against the 1% increase in all hotel structures in 2022. Consequently, the Italian hotel industry embodies a very appropriate context to test the relationship between EPU and operating performance.

An econometric model was developed to analyze this relationship using unbalanced panel data of 661 luxury hotels for the 2018–2022 period. As in many prior studies, we adopted both a descriptive analysis and a multivariate one to explore the combined effect of the explanation variables on performance of the selected hotel firms. Given the purpose of our research, annual information was extracted for hotel firms located all over Italy to avoid regional bias.

As economic performance is a dynamic process, data need to be longitudinal and a five-year period is used for the analysis. Our initial sample included all hotel firms reporting financial information annually over the mentioned period. To test the formulated hypotheses, the study draws on a comprehensive quantitative database (AIDA Bureau van Dijk) that contains large financial information of most Italian firms. Data were collected directly from independent hotels or from hotel chains operating in Italy and they must comply with certain selection criteria to check the hypothesis. We selected hotels stating accommodation as their primary activity. Hotel firms must have survived at least two years within the five-year period and they must have a time-invariant number of rooms to be included in the longitudinal dataset. As the hotel firms have different temporal section longitude (which ranges from 2 to 5 years), the database shows up as an unbalanced panel one. Therefore, we avoided to distort the sample towards the most profitable hotels by preventing bias that could arise when the dataset regards only those hotels operating in the entire period. The initial dataset included 668 luxury hotels. However, due to the unavailability of some performance variables, some hotels were dropped from the analysis and the final usable sample consists of 661 five-star hotels (3,305 hotel-year observations).

3.2 Independent variable

The main independent variable in this study is EPU. Searching for an appropriate proxy to measure economic uncertainty is difficult and there have been incremental efforts to quantify the EPU. Previous research has counted on different measures of uncertainty, such as stock market volatility, volatility index, economic growth rate and political risks. To test the relationship between EPU and hotel profitability, we rely on the EPU index developed by Baker *et al.* (2016). Since its introduction, this index has been considered the main proxy for uncertainty and it has been used in the corporate finance literature as well as in the tourism and hospitality research themes (Akron *et al.*, 2020; Demir and Ersan, 2018). EPU index has become a standard index to assess policy-related economic uncertainty and it has been widely used to gauge the impact of uncertainty on certain issues, e.g. stock prices, corporate investments, oil prices, gold prices and tourism demand (Antonakakis *et al.*, 2013; Aye *et al.*, 2015; Bekiros *et al.*, 2015; Kang *et al.*, 2014). It measures economic uncertainty linked to national policies by reflecting the uncertainty over who will make economic policy decisions and what and when actions will be taken as well as their economic effects. EPU index is reactive to changes in economic and political conditions, and therefore, it signals the uncertainty in an economy due to these fluctuations. The index tends to reach situations of stress in the financial markets which correspond to moments of international tension in the economic policy, carrying the economy down through businesses stop investing and consumers stop consuming.

EPU index is a composite measure of uncertainty, and it is constructed by combining three components: the number of articles that the major newspapers dedicate monthly to uncertainty over national economic policy (for Italy, Corriere Della Sera and La Repubblica); the degree of misalignment from reality of the economic forecasts of the various research institutes; uncertainty over fiscal policy. The weights assigned to each component are half, one-third, and one-sixth for news-based uncertainty, uncertainty of tax code expiration and uncertainty related to monetary policy and government spending, respectively. The components are then aggregated into a single monthly-basis overall EPU index.

Since our study uses yearly firm-level data and Baker *et al.* (2016) provide monthly updates of the index, the annual variable of EPU is the average of the monthly EPU index within each corresponding year. We access the publicly available monthly EPU data for Italy at EPU website located at https://www.policyuncertainty.com/. Based on recent studies applying the EPU index to investigate the economic effects of EPU (e.g. Ashraf and Shen,

2019; Caglayan and Xu, 2019; Ozili, 2021), we use the aggregated EPU index to examine its effects on several indicators of hotel performance.

3.3 Dependent variables

To better investigate the effects of EPU on the Italian hospitality industry, we use various measures of performance, assuming that when the economy is robust, and consumers have strong purchasing power, the demand for hotel services may tend to increase. Hotel performance is captured by three different indicators. Firstly, we use the revenue per available room (REVPAR) that shows the selling ability of hotel managers, where supply and demand converge (Ismail *et al.*, 2002; Sainaghi, 2010). REVPAR is calculated as the hotel room revenue divided by the total number of hotel rooms that can actually be occupied (available rooms). Secondly, we employ the average daily rate (ADR) to better analyze the impact of policy uncertainty on hotel performance. The ADR is a supply-side performance indicator that reveals the pricing power of hotel properties (Viglia *et al.*, 2016). It is calculated as the total room revenue in a given period divided by the total number of rooms reserved in the same period. These two ratios are commonly employed for assessing hotel performance as they are very critical for the effectiveness of hotel management and services (Chen, 2010; Chen *et al.*, 2012; Guillet *et al.*, 2012; Turner and Guilding, 2011; Xiao *et al.*, 2012). Finally, we used an additional operating variable to measure the actual demand for hotel services, i.e. the hotel room occupancy (OCCR) (Ozdemir *et al.*, 2022). The OCCR is a direct indicator of demand-side selling power and it is a commonly used performance measure of revenue in the hotel industry (Ozdemir *et al.*, 2022) because it is supposed to be the first indicator responding to changes in customer perceptions and economic uncertainties. We construct the OCCR as the ratio of the total number of rooms booked in a period to the total number of rooms available for sale in that period. Since these lodging-specific selling indicators are directly correlated to selling activities, they are valuable measures of hotel performance and they are highly effective in mirroring short-term variations in the economy (Sainaghi, 2011).

3.4 Control variables

We included a set of control variables in the model to account for firm characteristics that may affect hotel performance. To test our hypothesis, the selection of control variables was principally influenced by prior literature (Kim *et al.*, 2013). We employ hotel size, hotel age, meeting space capacity, family involvement, location and hotel leverage as firm control variables to examine the effect of EPU on hotel performance. Finally, to gain a fine-grained picture of general macroeconomic conditions, we control for annual economic growth that is measured as the annual percentage increase of gross domestic product (GDP) (Chen, 2010; Colak *et al.*, 2017; Nenu *et al.*, 2018) and the consumer confidence index (CCI) (in the natural logarithm form) (Chen, 2015; Demir and Ersan, 2018). Descriptions and formulas of the variables are presented in Table 1.

3.5 The regression model

To verify the relationship between EPU and hotel operating performance, we apply the generalized estimating equations (GEE) technique which is an extension of generalized linear model (GLM) in analyzing panel data. This technique estimates the parameters of a generalized linear model with a possible unmeasured correlation and has the ability to adapt various within-group correlation structures. Additionally, it captures both within- and between-firm variance and it generates robust standard errors (Ballinger, 2004). GEE attains better stability and higher degree of solution convergence than other panel data analysis through a less severe computational nature in large datasets (Schneper and Guillen, 2004). We

Variable	Description	Measure
Dependent variables		
REVPAR	Revenue per available room	Hotel room revenue/No. of rooms available for sale
ADR	Average daily rate	Hotel room revenue/No. of rooms reserved
OCCR	Occupancy rate (room occupancy)	No. of rooms booked/No. of rooms available for sale
Independent variable		
EPU	EPU index	Year average EPU index (12-month average EPU index monthly-basis values)
Control variables		
SIZE	Hotel size	Natural logarithm of the no. of rooms
AGE	Hotel age	The difference between the data year of observation and the year of hotel opening
SPACE	Meeting space capacity	Meeting and restaurant space capacity (measured in square feet)
FAM	Family involvement	Dummy variable equal to 0 for non-family-owned hotels and equal to 1 for family-owned hotels (percentage of equity held by family owners at least 51%)
LOC	Hotel location	Dummy variable taking the value 1 for firms located in coast areas, or 0 otherwise
LEV	Hotel leverage	Financial leverage, measured as total liabilities divided by total equity
GDP	Gross Domestic Product (GDP) per capita	Yearly percentage change of Gross Domestic Product (GDP)
CCI	Consumer confidence index	Value of the consumer confidence index

Table 1. Explanation of variables

apply the xtgee routine in Stata 15 statistical software to test our models. As a robustness check, we also implemented fixed-effects model by running the xtreg fe routine in Stata 15 to verify that our model is an appropriate estimation technique for panel data analysis and to check the robustness of our findings.

We verify whether there are conditions that can attenuate or worsen the negative effect of EPU. Hence, we examine the moderating effect of hotel chain affiliation, conference space and location on the EPU-performance relationship. The first circumstance we consider is the affiliation with a hotel brand chain. That is, we expect that hotel belonging to a brand hospitality chain may get on better relative to an independent property when EPU is high. Hotels affiliated with a national or international hospitality chain should react better under reasonable political uncertainty, because owners' and managers' concerns are considerably higher in hotels adopting chain-affiliated brands. Managers in a hotel group are concerned about the performance of their hotel structures because the manager evaluation is closely related to the hotel operating performance. When the hotel is affiliated to a hospitality brand, hotel managers may get involved in formulizing revenue-maximizing strategies including the type of hotel investments and services (Xiao *et al.*, 2012). Therefore, chain affiliated hotels tend to react more rapidly and early to uncertainties due to their forward-looking approach and flexibility in decision making. To test this claim, we captured data of hotel affiliations, and we used a dummy variable, which we labeled hotel chain, as a moderator of the relationship between EPU and hotel performance. Hence, to test the moderating effect of hotel chain affiliation, we created the interaction term EPU_chain. The second condition we contemplate is the moderating effect of conference space. There is not widespread literature explaining the relation between meeting space availability and hotel operating performance. However, from the business perspective, the role of meeting business to overall financial performance is significant. Even in periods of decreasing room sales, there may be extensive

demand for meeting space because most of the business summits do not necessarily involve accommodation. Despite the lack of large empirical evidence regarding the relation between conference space availability and hotel performance, a recent study demonstrated that the presence of conference space positively affects hotel occupancy rate, ADR and RevPAR (Madanoglu and Ozdemir, 2016). Then, we employed the interaction term of EPU and conference spaces (EPU_conference). Lastly, we examine the moderating role of spa and wellness center in the relationship between EPU and hotel performance. We verify whether additional hotel service matters in implicating the adverse effects of EPU on hotel performance. For this purpose, we explore two main types of hotel in this analysis using a dummy variable that coded 1 for hotels with wellness facilities, and 0 otherwise. For the moderation analysis, we computed the interaction term of EPU and hotel wellness services (EPU_wellness). The findings of this additional analysis are reported in the main regression findings section. In all three moderating analyses, EPU was mean-centered to reduce multicollinearity.

4. Results

This section examines the impact of EPU on hotel performance. First, we present descriptive statistics and correlations. Then, we analyze the main estimation results, and lastly, we explore some robustness checks.

4.1 Descriptive statistics

The descriptive statistics of the main variables for the entire sample are presented in Table 2.

Table 2 exhibits summary statistics of the variables used in the analyses. The average REVPAR is 64.9477 and the mean ADR is 88.3759. The mean OCCR of the sample is 68.9388%, ranging from a minimum of 2.1474% and a maximum of 115.4756%. Regarding the control variables, our sample consists of hotels of different sizes and different capital structures (from debt-free to those with more severe financial problems). During the time of observation, the properties have been in business for an average of 25.27 years, and the mean meeting space capacity is 12,787 square feet. The mean of the EPU score for the sampled properties is 123.47. Average annual growth in GDP is reported as 2.06% and the consumer sentiment index has a mean score of 87.94.

Table 2. Descriptive statistics

Variables	Min	Max	Mean	Median	Std Dev
Dependent variables					
REVPAR	1.8456	548.0992	64.9820	62.9477	44.0983
ADR	16.9118	632.9182	88.3759	87.1446	52.2778
OCCR	2.1474	115.4756	68.9388	65.3556	16.8471
Dependent variable					
EPU	54.25	243.22	105.12	103.56	31.85
Control variables					
SIZE	0.000000	8.239911	1.890007	1.650055	0.256885
AGE	0.000000	107.65662	25.277922	20.252466	15.217784
SPACE	0.000000	39777.8349	12786.9866	5.615014	32487.2538
FAM	0	1	0.694377	0.588995	0.492817
LOC	0	1	0.508860	0.602442	0.273409
LEV	0.000000	5.99466	0.383889	0.295668	0.625887
GDP	−13.534456	10.406778	2.063117	0.188755	3.755467
CCI	76.609325	92.669793	90.133234	95.735754	1.334572

We have calculated the Pearson correlations to check for multicollinearity among continuous variables (Hair *et al.*, 2006). Table 3 displays the Pairwise correlation coefficients between the variables comprised in the regression model. A valuable observation from the correlations is that RevPAR and OCCR are negatively correlated with EPU while ADR and EPU are positively correlated (correlation coefficients of −0.02883, −0.14272 and 0.05131 for RevPAR, OCCR and ADR, respectively). All three performance measures are positively correlated with each other. Besides, they are also positively correlated with all control variables of the study.

The matrix (Table 3) shows that the correlations between the variables are not strong. After each estimation, we derive the variance inflation factors (VIFs). Based on the VIFs, we conclude that there is no threat of multicollinearity between study variables because all VIFs are below the suggested threshold of 10. The value of variance inflation factors (VIF-test) reveals that multicollinearity is not a severe issue since it is found far below the critical value. The correlation coefficients of variables are lower than the threshold level of 0.90, demonstrating an insignificant multicollinearity among variables (Hair *et al.*, 2006). The correlation coefficients indicate that the employed model is reliable and very satisfactory as there is not a high correlation between each of the variables even at its maximum degree.

4.2 Main regression findings

We present the estimation results of the empirical models in Table 4. The table shows the effect of EPU on the three selected hotel performance indicators (REVPAR, ADR, OCCR). We calculated the estimations considering only the control variables (basic models) and then we ran the basic models adding the EPU variable into the regression analyses (extended models). We test the influence of EPU on hotel performance and we report the findings of the GEE estimations used for the analysis. For each hotel performance indicator (REVPAR, ADR and OCCR), we ran the models with control variables only (Basic Models 1, 2 and 3, respectively). In Model 1, hotel age, meeting space, leverage and CCI are positively and significantly related to REVPAR, whereas hotel size, location and annual GDP growth have a negative and significant impact on it. Model 2 indicates that all control variables except family involvement have a positive and significant effect on ADR. We also verify that hotel occupancy is high in larger hotels and in periods of higher GDP growth. On the contrary, hotel age, leverage and meeting space have negative effects on hotel occupancy. The family involvement variable is negatively related with occupancy too, but this effect is not significant at the conventional 5% level.

Then, we amplified the basic models by including the EPU variable to verify the main findings (Extended Models 1, 2 and 3). For all three hotel performance indicators, we detect a significant negative relationship between EPU and hotel performance. Coefficients of the EPU in all the extended models are consistently negative and significant at the 0.05 significance level ($\beta = -0.0638830$, $\beta = -0.1210866$, and $\beta = -0.0004476$ for REVPAR, ADR and OCCR, respectively). Among the three performance measures, we verify that the most robust negative impact of EPU is on ADR, followed by REVPAR. Main regression results are consistent with our predictions and confirm the findings of prior literature (Chen *et al.*, 2020; Lee and How, 2023b; Madanoglu and Ozdemir, 2018), which reported a decline in room demand when the level of policy-related economic uncertainty increases. Our study also follows the research assumptions of Gozgor and Ongan (2017) about the impact of policy-related economic uncertainty on tourism demand. Since the hotel industry is one of the major players in the wider tourism and travel sectors, the decline in hotel room demand (i.e. hotel room occupancy) under high EPU periods is highly related to the drop in overall tourism expenditures. Considering that consumer sentiment in economic policy conditions is a dominant factor of the service products' consumption spending (Sims *et al.*, 2012; Dees and Soares Brinca, 2013; Gholipour and Tajaddini, 2017; Svensson *et al.*, 2017), high EPU is

Table 3.
Correlation matrix

Variables	EPU	REVPAR	ADR	OCCR	SIZE	AGE	SPACE	FAM	LOC	LEV	GDP	CCI	VIF
EPU	1.0000												1.145
REVPAR	−0.02883*	1.0000											2.006
ADR	0.05131*	0.44785	1.0000										1.577
OCCR	−0.14272*	0.41867	0.38240	1.0000									1.499
SIZE	0.00434	0.057533	0.04895	0.04785	1.0000								1.134
AGE	0.03211*	0.03501*	0.04133*	0.04142*	0.02367	1.0000							1.088
SPACE	0.12433*	0.14867*	0.14186*	0.14874*	−0.01155	0.18536*	1.0000						1.076
FAM	0.02589*	0.0287*	0.02589*	0.02895*	0.05674	0.19776*	0.09204*	1.0000					1.137
LOC	0.03645*	0.02378*	0.0233*	0.02445*	0.07849	0.11262*	−0.04892*	−0.0044	1.0000				1.152
LEV	0.07355*	0.071284*	0.07311*	0.0773*	0.07774	0.32153*	0.12412*	0.0878*	0.1322*	1.0000			2.005
GDP	0.014554	0.013875	0.013825	0.014967	−0.02106*	0.05298*	−0.04041*	−0.01125	0.00154	0.24511*	1.0000		1.574
CCI	−0.15376*	0.15754*	0.14723*	0.148112*	0.04933	−0.01582*	−0.04285*	−0.0316*	0.03881*	0.0582*	−0.13899*	1.0000	1.495

Note(s): Please see Table 1 for variables definitions
*$p < 0.05$

Table 4. Panel regression results

	Model 1 – REVPAR				Model 2 – ADR				Model 3 – OCCR			
	Basic model		Extended model-EPU		Basic model		Extended model-EPU		Basic model		Extended model-EPU	
	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value
EPU			−0.0638830	(0.000)***			−0.1210866	(0.000)***			−0.0004476	(0.000)***
SIZE	−0.0085067	(0.000)***	−0.0175466	(0.000)***	0.0069675	(0.000)***	−0.0054887	(0.033)*	0.0001056	(0.000)***	0.0000543	(0.000)***
AGE	0.6345631	(0.000)***	1.1896653	(0.000)***	0.1877654	(0.000)***	1.1677809	(0.000)***	−0.0036650	(0.000)***	0.0025667	(0.000)***
SPACE	4.5546788	(0.011)*	5.3400976	(0.008)*	0.9481334	(0.013)*	2.3755634	0.000)***	−0.0328876	(0.000)***	−0.0196722	(0.000)***
FAM	1.4188721	(0.342)	−5.5549081	(0.000)***	0.1702453	(0.719)	−9.2440987	(0.000)***	−0.0023667	(0.391)	0.0805542	(0.000)***
LOC	−0.0075034	(0.000)***	−0.0275366	(0.000)***	0.0059674	(0.000)***	−0.0048887	(0.032)*	0.0002055	(0.000)***	0.0000720	(0.000)***
LEV	0.6145625	(0.000)***	1.1796621	(0.000)***	0.1868631	(0.000)***	1.1777810	(0.000)***	−0.0046642	(0.000)***	0.0026632	(0.000)***
GDP	−0.0641365	(0.000)***	−0.3167082	(0.000)***	0.5831546	(0.000)***	0.3784553	(0.000)***	0.0095577	(0.000)***	0.0072988	(0.000)***
CCI	0.0000007	(0.000)***	0.0000007	(0.000)***	0.0000000	(0.000)***	0.0000000	(0.000)***	0.0000004	(0.000)***	0.0000003	(0.000)***
Constant	123.7656000	(0.000)***	123.3374000	(0.000)***	0.7244587	(0.000)***	0.7655432	(0.000)***	99.5644698	(0.000)***	99.8873420	(0.000)***
Wald Chi Squared (χ^2)	113476.09		127665.92		87932.07		138462.83		–		–	
Prob > χ^2	(0.000)***		(0.000)***		(0.000)***		(0.000)***		–		–	
N × Ti	3,305		3,305		3,305		3,305		3,305		3,305	

Note(s): $N = 661$ (number of hotel firms). $N \times T_i$ is the number of observations
Time period 2018–2022
For Model 3, Wald χ^2 statistic is missing because the number of constraints is greater than the number of clusters in that model
***$p < 0.001$, *$p < 0.05$

supposed to decline the confidence among hotel customers and then it reduces consumer demand of hotel room nights (occupancy). The identified negative relationship between EPU and the hotel performance indicators (e.g. REVPAR and ADR) confirms our research hypothesis but it is in contrast with the study of Lee and How (2023a) who checked no impact of domestic EPU on room rates of luxury hotels. In this regard, our results uncover that the lodging segment (i.e. luxury) does not mitigate the effects of EPU on hotel performance since a negative impact is still found.

Regarding the control variables, we observe that hotel age and CCI are positively related to the three hotel performance measures. Hotel size is negatively related to REVPAR and ADR, but it positively associated with OCCR. Family-owned hotels are positively associated with REVPAR and ADR, but they are negatively related to OCCR. Annual GDP growth has a negative effect on REVPAR but a positive effect on OCCR and ADR. Based on results reported in Table 4, we achieve that high EPU decreases hotel performance.

In Table 5, we present the results of the estimations by which we observe the impact of moderator effects (hotel brand chain affiliation, conference space and hotel wellness services) on the relationship between EPU and hotel performance (REVPAR, ADR and OCCR). In this analysis, we focus principally on REVPAR because it embodies the joint effect of price setting (i.e. ADR) and the level of customers' acceptance to that price (i.e. OCCR). The results of the first moderating analysis reveal that the interaction term of EPU and chain affiliation (EPU_chain) is positively related to REVPAR ($\beta = 0.0270155, p < 0.001$). The statistically significant positive coefficient of this interaction term suggests that hotels that are affiliated to a hospitality brand chain suffer a lower drop in RevPAR under uncertain economic conditions. Regarding the moderating effect of having conference space on the relationship between EPU and hotel performance, results show that the interaction term EPU_conference is positively related to REVPAR ($\beta = 0.0006612$) but the relationship is not statistically significant ($p = 0.377$). A quantitative inspection of the moderating role of conference space reveals that hotels with meeting areas experience a lower percentage decrease in REVPAR when EPU is high but this reduction is not statistically significant. The last moderator variable (EPU_wellness) is positively related to REVPAR ($\beta = 0.0492166, p < 0.001$) suggesting that the negative effect of EPU on REVPAR is less severe for wellness hotels. Hence, hotels with spa and wellness center are able to maintain their REVPAR levels even when EPU is high. The findings signal that high EPU has a negative impact on luxury hotel performance but the depressive effect is mitigated by the specific hotel wellness services. This result denotes a tempering effect of the wellness facilities in luxury hotels, confirming that the negative effect of EPU is less pronounced for hotels providing specific wellness facilities.

4.3 Robustness test

To ensure that the main models are correctly stated, we ran a fixed-effects model by including all time-variant variables with hotel performance measures forwarded by 12 months (t+12) which increased our confidence in findings. In the robustness checks we use the 12-month forwarded value for the dependent variables because EPU is not expected to affect hotel performance contemporaneously. Hence, to test whether the proposed effect of EPU on hotel performance expands to a further time period, we postulate that past conditions related to EPU can impact on future hotel performance. Although it is uncertain how long hotel operators and consumers react to changes in policy uncertainty, we apply the 12-month forwarded values where hotel performance scores refer to the same month of the independent variable a year later. We employed the alternative forward values (e.g. t+12) for hotel performance because such an approach may partially disguise the consequence of seasonality in tourism, although 12 months may be considered too distant in the future to sufficiently capture consumers' and hotel operators' reactions to EPU. To improve the main

Table 5. Estimations of moderator effects

	Panel A – chain affiliation			Panel B – conference space			Panel C – SPA and wellness center		
	REVPAR	ADR	OCCR	REVPAR	ADR	OCCR	REVPAR	ADR	OCCR
EPU	−0.0776603	−0.0600603	−0.0003955	−0.1022709	−0.0597707	−0.0007955	−0.1017553	−0.0514258	−0.0007622
	(0.315)	(0.000)***	(0.000)***	(0.000)***	(0.013)*	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Chain	0.9974127	3.3827700	−0.0073710						
	(0.517)	(0.045)*	(0.319)						
EPU_chain	0.0270155	−0.0020117	0.00031770						
	(0.000)***	(0.419)	(0.000)***						
Conference				0.6770235	5.90990122	−0.0183132			
				(0.000)***	(0.000)***	(0.000)***			
EPU_ conference				0.0006612	0.00928119	0.0000873			
				(0.377)	(0.000)***	(0.000)***			
Wellness							114.3270100	158.8020100	0.03331210
							(0.000)***	(0.000)***	(0.000)***
EPU_ wellness							0.0492166	0.1020173	0.00052778
							(0.000)***	(0.000)***	(0.000)***
Constant	90.9579044	116.4371000	0.7764004	99.3679040	127.8371050	0.7934002	66.6979000	101.8371044	0.6234252
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Wald Chi Squared (χ^2)	3658.77	4590.53	–	139836.82	127395.35	–	123745.43	110557.45	–
Prob > χ^2	(0.000)***	(0.000)***	–	(0.000)***	(0.000)***	–	(0.000)***	(0.000)***	–
N × Ti	3,305	3,305	3,305	3,305	3,305	3,305	3,305	3,305	3,305

Note(s): $N = 661$ (number of hotel firms). $N \times T_i$ is the number of observations
Time period 2018–2022
For OCCR, Wald χ^2 statistic is missing because the number of constraints is greater than the number of clusters in that model
Coefficients of each variable are presented in the first raw followed by the p-values shown in parentheses in the row below
***$p < 0.001$, *$p < 0.05$

results of this study, we also check separately the three sub-indices of EPU (i.e. news-based uncertainty, uncertainty of tax code expiration and uncertainty related to monetary policy and government spending (Baker *et al.*, 2016) as independent variables. Hence, we run a regression model where we included the three sub-indices as predictor variables to differentiate the individual effects of EPU on hotel performance. Hence, we run a regression model where we included the three sub-indices as predictor variables to differentiate the individual effects of EPU on hotel performance. These analyses were implemented with the t+12 values of hotel performance measures to ensure that the findings are robust to alternative specifications. Results largely support our main analysis as they reveal that the three sub-indices have a significant negative relationship with the 12-month forwarded values of all the three hotel performance measures. The datasets of additional estimations are not reported in tabular form in the interest of saving space and improving the readability of the paper.

5. Discussion and conclusions

5.1 Conclusions

The study provides a first-hand evidence of how EPU affects hotel performance at the property level. In the last few years, EPU had a broad-based impact on the tourism industry in many countries across the globe. Supporting these circumstances and in line with previous studies (Gulen and Ion, 2016; Gozgor and Ongan, 2017; Jens, 2017) our results suggest that EPU has a negative relationship with hotel performance. The findings demonstrate that EPU impacts negatively on hospitality expenditure and then on hotel performance at the property level, supporting prior literature (Bronner and De Hoog, 2012; Chen *et al.*, 2020; Madanoglu and Ozdemir, 2018). In particular, uncertainty is a severe macro-economic factor that declines the demand for hotel services, and alters occupancy rate and REVPAR. We verified that the negative effects of EPU are less pronounced for hotels that are affiliated to a hotel brand chain and for wellness hotels. Hence, our findings reveal a tempering chain affiliation effect for some properties and an attenuating impact of wellness services. To the best of our knowledge, this is the first study that attempts to offer a fine-grained explanation of the hotel firms' behavior under uncertain economic conditions in the Italian tourism literature by exploring the moderator effects of specific hotel characteristics.

5.2 Theoretical implications

This study has theoretical implications for future research and several policy implications for various parties. From a theoretical perspective, the analysis proposes a preliminary research path to investigate the underlying reasoning behind the behavior of individual luxury tourism businesses under uncertain economic conditions (Chen *et al.*, 2020). From a political perspective, the findings emphasize that government should increase and promote tourism demand by further nurture the growth of tourism supply in periods of uncertainty and crisis. If the cause of uncertainty is local, governments should take actions to defend hospitality companies, for instance by opening new credit channels, creating refinancing options and providing tax incentives. For example, since the performance of highly indebted hotel firms is more affected by uncertainty, new credit channels should be very important for these companies because they have less capabilities to raise funds. A proactive behavior in this sense will mitigate the negative effect of EPU in hospitality sector. Additionally, governments should try to minimize EPU by a more transparent and predictable economic decision-making process towards a more stable economic environment. Lastly, this paper represents a breakthrough in the tourism policy because it detects how the depressive effect of uncertainty periods can be mitigated by specific hotel characteristics.

5.3 Practical implications

This study offers valuable insights also for practitioners and operators in hospitality industry. From managerial and operational points of view, hotel managers should be aware of the negative consequences of rising uncertainty and then they take defenses against decreasing profitability. Thus, managers should adopt flexible policies that allow hotels to adjust their hospitality activity when uncertainty arises (Demir *et al.*, 2019). For instance, before or during uncertain periods, managers can try to stabilize the decreasing hotel demand by applying special discounts or packages and by developing well-structured and cost-effective marketing campaigns (Barbe and Pennington-Gray, 2018; Madanoglu and Ozdemir, 2018). Additionally, managers can maintain cost-saving behaviors (e.g. labor staffing, holding less inventory and postponing investment decisions) and come up with strategies to deal with the policy-related economic uncertainty. The study also suggests potential line of forward-looking actions to combat the decline of room demand and room prices during times of EPU. In this regard, since EPU has a lagging effect on hotel performance, our study advises that hotel owners and managers could anticipate the negative effects of uncertain policy-related economic conditions on hotel performance when their extended negative impact are expected to last in the future. The prolonged effects of EPU on the hotel business lead managers to take precautionary actions that are supposed to stabilize the expected demand in the upcoming months while still achieving reasonable room prices and efficient planning of room capacity. Therefore, hotel practitioners should plan ahead strong contingency plans to battle declining demand from their existing customer base and compensate their losses by attracting international visitors from other tourism markets. Another implication of the current study is that newly established hotels should be more proactive in handling with the negative effects of an increasing EPU. In this regard, hotels with shorter operating history exhibit worse performance in terms of room occupancy than more established properties.

5.4 Limitations and future research

This study has some limitations. Firstly, the investigation did not examine how hotel profitability is affected by the four components of the EPU index proposed by the Baker *et al.* (2016). This limitation is due to the non-availability of data on the EPU index components for the Italian context. Future research could explore how hotel profitability is affected by each of the four components of the EPU index individually. In this regard, future studies can delve into the relationship between the specifics of EPU and hotel performance by considering a wider range of uncertainty's measures. Secondly, the study relies on data from a sample of luxury hotels in Italy. Although this cluster represents a profitable range of properties in the Italian context, future research can focus on different segments (e.g. economy hotels) and sizes of Italian hotels. Advancing research through cross-country comparisons in the European hospitality sector could be another avenue for future investigation as well. Thirdly, our study is purely quantitative in nature and all findings and their interpretations are valid and meaningful since the variables are efficient measures. Therefore, further research may incorporate qualitative components to verify how consumer confidence on uncertainty affects hotel demand by thoroughly collecting direct behavioral responses to fluctuations in EPU. Finally, future studies should deep dive the effects of EPU in various and different contexts. In this respect, we believe that interesting findings may be derived from other tourism subindustries (i.e. travel, recreation, food and beverage) with regards to how their demand and revenues are influenced by a strong EPU.

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