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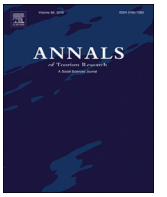

Research Note

Tourism seasonality and gambling: The role of a new casino's opening

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Introduction

The gambling industry has been traditionally considered a complement for the tourism sector that might foster its development (Eadington, 1999). Several studies have put forward the notion that the opening of new casinos can be an effective strategy for economic growth (Lee, 2011; Rephann, Dalton, Stair, & Isserman, 1997) and tourism destination enhancement (Pearce, 1999). Gambling tourists are more likely to recommend the destination, particularly in cases of winning outcomes (Masiero, Qian, Fong, & Law, 2018). Nonetheless, Felsenstein and Freeman (1998) and Smith and Hinch (1996) have shown that the role of casinos in enhancing tourism demand might be less quantitatively relevant that typically assumed.

On the other hand, tourism seasonality is a central topic in the literature given its implications in terms of sustainable goals, labour markets and housing affordability, among others. Despite the extant research on the topic, little is known yet about the factors that contribute to alleviate (or increase) tourism seasonality in regional areas.

This paper evaluates the effect of the opening of new casinos on tourism seasonality in Spain. While most studies have focused on the North American market (Smith & Hinch, 1996), the role of the gambling industry in stimulating tourism flows has been less studied in top destinations like Spain. The Spanish case is relevant because it exhibits high tourism seasonality (Duro, 2016) together with an increased participation in gambling in recent years (Humphreys & Perez, 2012). Consistent with previous literature, the opening of new casinos might increase the attractiveness of a province and therefore its tourism demand. What is less obvious is whether the potential rise in arrivals is concentrated in the high (increasing tourism seasonality) or in the low season (decreasing seasonality).

Data and methods

Seasonality indicators

Monthly data on the number of tourist arrivals per province ($TOURISTS_{imt}$) are drawn from the Spanish National Statistics Institute for the period 2003–2019. Based on this, we compute the following two indicators of seasonality:

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• Coefficient of variation (CV):

$$CV_{it} = \frac{SD(TOURISTS_{imt})}{\sum_{m=1}^{12} TOURISTS_{imt} \frac{1}{12}} \quad (1)$$

where i stands for provinces, m denotes months and t refers to years.

• Modified Theil measure (T):

$$T = \ln 12 - \sum_{m=1}^{12} s_{it} \ln \frac{1}{s_{it}} \quad (2)$$

where $s_{it} = \frac{TOURISTS_{imt}}{\sum_{m=1}^{12} TOURISTS_{imt}}$.

These two measures are standard indicators of tourism seasonality (Duro, 2016). They capture the degree of concentration of arrivals within the year: the greater their value, the greater the concentration of tourism demand.

Opening of new casinos

Data on the number of casinos open per province and year is obtained from the Spanish Ministry of Consumption for the period 2003–2019. To examine their influence on tourism seasonality, we exploit the temporal variation in the opening of new casinos across regions. The provinces of Badajoz (2005), La Rioja (2005), Asturias (2006), Sevilla (2006), Tarragona (2006), Castellón (2008), Toledo (2015) and Granada (2018) are the only ones that authorised a new casino opening during the sample period and compose the 'treatment' group. Out of the remaining 44 provinces, 23 have at least one casino during the whole period. These provinces are discarded because identification requires a comparison group that has never had a casino. Therefore, the control

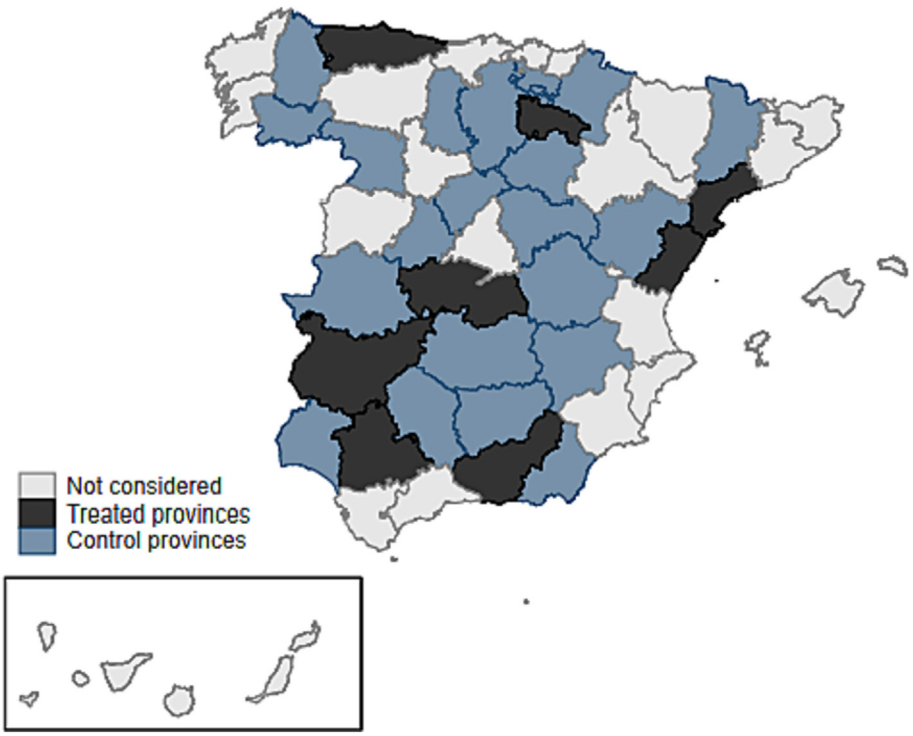

Fig. 1. Treated (black) and control (blue) provinces.

group is composed only of the 21 provinces with no casino at any period. Fig. 1 illustrates the composition of the sample (see Appendix for further details).

Empirical strategy

We first propose the following canonical panel regression with year and province fixed effects:

$$Y_{it} = \alpha + \beta Newcasino_{it} + \gamma X_{it} + Year_t + \mu_i + \epsilon_{it} \quad (3)$$

where Y_{it} is the seasonal indicator, $Newcasino_{it}$ is a dummy for whether a new casino has been opened in province i in year t, X_{it} is a set of control variables, $Year_t$ and μ_i are year and province fixed effects, and ϵ_{it} is the error term. GDP (in logs), population (in logs), the Consumer Price Index (CPI), the number of hotel establishments (in logs), and a dummy for the presence of an airport in the province (D_AIRPORT) are considered among the controls. These variables capture the moderating impact of economic development, population size, prices, the degree of tourism development proxied by the number of hotels and air transport accessibility. Detailed descriptive statistics (Tables A1-A3) and plots of the time evolution of the seasonal indicators (Figs. A2 and A3) are presented in Appendix.

The two-way panel fixed effects (TWFE) regression in Eq. (3) mimics a difference-in-differences (DiD) research design. The parameter β would measure the causal effect of $Newcasino_{it}$ on Y_{it}, conditional on the controls. However, under staggered adoption, β in Eq. (3) is a weighted average of all the 2×2 combinations of never treated, not yet treated and already treated units in each period (Goodman-Bacon, 2021). In the presence of treatment effect heterogeneity, the TWFE estimator in Eq. (3) is a biased estimator of the causal effect of the event of interest (de Chaisemartin & D'Haultfoeuille, 2020). Therefore, to get more precise estimates, we move to Abadie's semiparametric DiD estimator (Abadie, 2005), which addresses the imbalance in characteristics using propensity score matching based on the values of X_{it}. Moreover, this estimator (i) allows for heterogeneous treatment effects based on covariates, and (ii) is robust to violations of the parallel trend assumption required in linear parametric DiD settings. As such, we guarantee a better comparison of the counterfactual outcomes.

Results

We first estimated the regression in Eq. (3) using $TOURISTS_{imt}$ as the dependent variable (Appendix, Table A5). We document that the opening of a casino is associated with an annual increase in arrivals of around 192,600 tourists. Accordingly, casino openings stimulate tourism demand, in line with previous literature (Masiero et al., 2018; Rephann et al., 1997).

Table 1 presents the coefficient estimates for the TWFE regression in Eq. (3) using the seasonality indicators as dependent variables. The year fixed effects are plotted in Appendix, Fig. A4. We find that the opening of a casino is not significant for explaining tourism seasonality, either using the CV or the Theil index. However, under staggered adoption and treatment effect heterogeneity, some units might get negative weights, thereby producing a substantial bias in β (de Chaisemartin & D'Haultfoeuille, 2020). Indeed, separate regressions by groups of treated and neighbouring control provinces indicate the impact of casinos on seasonality

Table 1
Results from panel TWFE regression.

Dependent variable	(1)	(2)
	CV	T
Newcasino	−0.005	2.7e-04
	(0.008)	(0.003)
Ln GDP	−0.086*	−0.037**
	(0.045)	(0.018)
Ln POPULATION	0.174***	0.085***
	(0.045)	(0.018)
CPI	−0.008**	−0.004***
	(0.004)	(0.002)
Ln HOTELS	−0.066***	−0.020**
	(0.019)	(0.008)
D_AIRPORT	0.009	0.001
	(0.011)	(0.004)
Province fixed effects	YES	YES
Year fixed effects	YES	YES
Constant	0.308	−0.071
	(0.978)	(0.396)
Observations	493	493
Provinces	29	29

Robust standard errors in parentheses.
*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.1$.

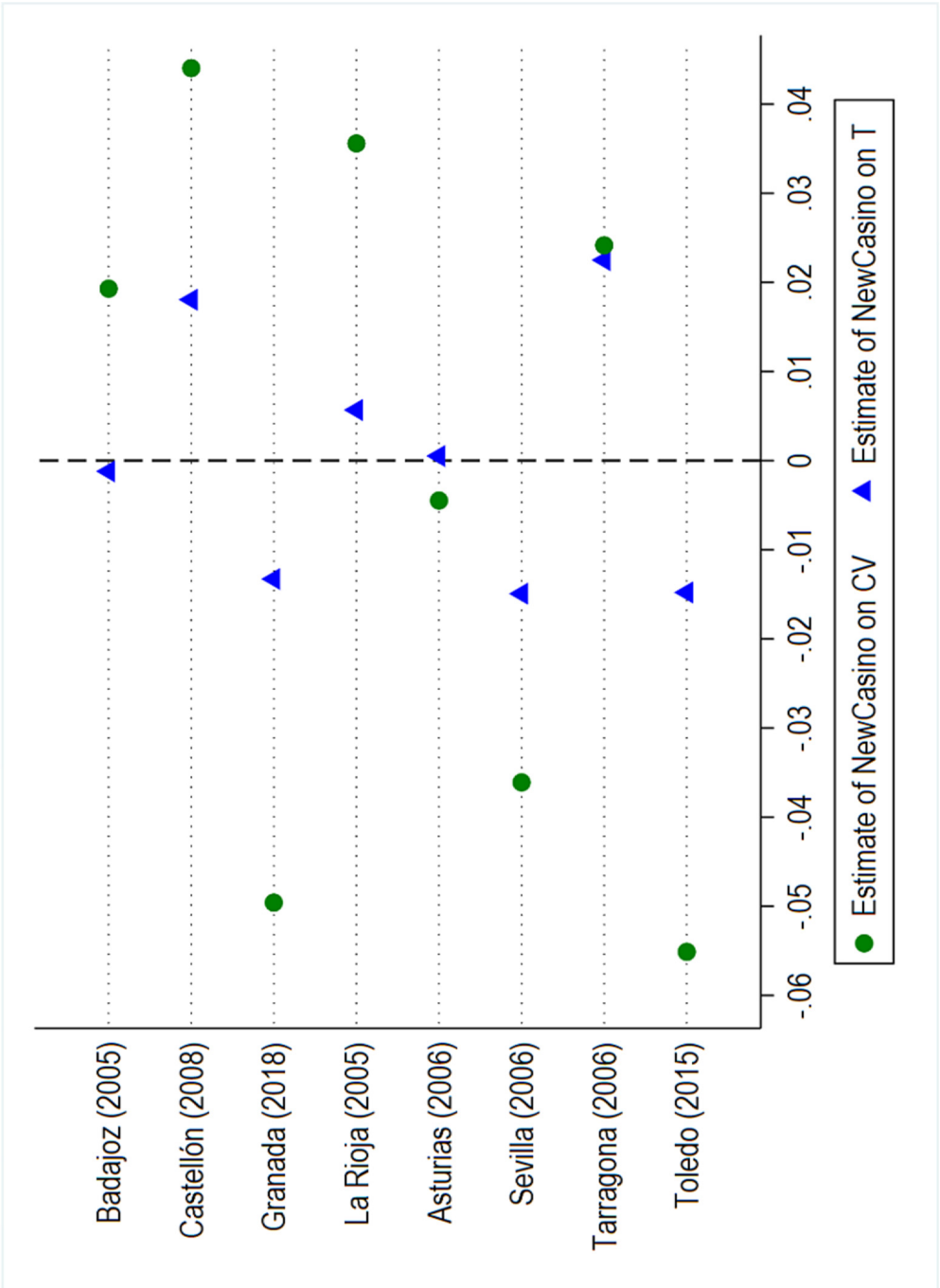

Fig. 2. Heterogeneous treatment effects of *NewCasino* on CV and T obtained after heterogeneous slopes fixed-effects regression (Wooldridge, 2010).

Table 2
Results from Abadie's semiparametric DiD regression.

Dependent variable	(1)	(2)
	CV	T
ATT	0.093***	0.029***
	(0.034)	(0.010)
Observations	493	493
Provinces	29	29

Robust standard errors in parentheses.
*** $p < 0.01$.

is heterogeneous (Appendix, Tables A7 and A8): it is positive for Tarragona, La Rioja and Castellón; negative for Sevilla, Toledo and Granada; and non-significant for Badajoz and Asturias. The heterogeneous fixed-effects model with individual-specific slopes (Wooldridge, 2010) for *NewCasino* offers the same results (Fig. 2). This falls in line with Rephann et al. (1997), who also detected that not all US states benefit equally from casino development. These heterogeneous effects are likely to be explained by the size and characteristics of the casinos and the differences in the type and quality of tourist destinations.

Regarding the controls, seasonality is positively associated with population size but negatively related to regional prices, GDP and the number of hotels. That is, demand concentration is higher in more populated provinces but lower in rich areas with a larger supply of hotels and high prices. For these variables, the estimates cannot be given a causal interpretation. Moreover, seasonality is not related to the tenure of an airport but has increased over time (Fig. A4).

Table 2 reports the Average Treatment Effect on the Treated (ATT) obtained from Abadie's semiparametric DiD estimator. The propensity scores used to reweight observations are estimated using logit regression (Appendix, Table A9). In this case, we document a positive and significant effect, implying that casino openings *increase* tourism seasonality. Therefore, despite the impact of new casinos being region-specific, we find the positive effect for Tarragona, La Rioja and Castellón dominates the negative one for Sevilla, Toledo and Granada. Interestingly, when we allow for heterogeneous ATT based on covariates (Appendix, Table A10), the positive effect increases with province GDP and the number of hotels but diminishes with population size and the tenure of an airport.

Our results are consistent under a battery of robustness checks considering alternative dependent variables and model specifications (see Appendix).

Discussion

Our results indicate that casino openings exert a positive effect on tourism seasonality. This suggests that the increase in demand associated with gambling travel motive mainly takes place during the high season, thereby concentrating arrivals. Notwithstanding this, auxiliary regressions point to the effect being heterogeneous and even negative for some areas. Furthermore, seasonality is positively correlated with population size but negatively associated with regional prices, GDP and the number of hotels. Moreover, the casino-induced increase in seasonality is larger for wealthier and more tourism-developed regions. The latter offers novel theoretical insights about the heterogeneous impacts of casinos on tourist destinations.

The findings have interesting implication for gambling stakeholders and for regional governments concerning the increase of gambling availability as a driver of tourism arrivals. Consistent with previous works (Pearce, 1999; Rephann et al., 1997), casino openings are found to enhance tourism demand and can be a valuable source of tax revenues (Lee, 2011). However, the rise in demand mainly takes place during the peak season, increasing seasonality and placing more pressure on the carrying capacity of tourist areas. High seasonality is highly undesirable because it compromises sustainability goals and produces more volatility on tourism revenues. Since casino openings are regulated by regional public administrations in Spain, our findings suggest cautionary advice for policy makers pursuing casino openings as a tourism development strategy in already wealthier and highly seasonal provinces. In contrast, less touristically-developed provinces with low seasonality are who should pursue the granting of new casino licences; they would foster their tourism demand but without concentrating it too much. Moreover, policy makers and casino managers might develop marketing strategies to foster casino demand during the low season, thereby spreading tourism arrivals for gambling motive throughout the year.

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Data availability

Data will be made available on request.

Declaration of competing interest

The author(s) have nothing to disclose.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.annals.2023.103529.

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