



Real-time forecasting regional tourism with business sentiment surveys



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HIGHLIGHTS

- We include business sentiment indicators in naïve and STS models.
- We evaluate forecasting accuracy with descriptive and inferential methods.
- Business sentiment indicators improve goodness of fit and forecasting accuracy.
- Extending business sentiment surveys to tourism promises great informative gain.

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ABSTRACT

This study provides evidence that supply-side soft information, retrieved from business surveys, is effective in real time forecasting of hotel arrivals at the regional level. We assess the effect of including business sentiment indicators in commonly used naïve specifications and structural time series models, using residuals and predictive diagnostics. We find that both the goodness-of-fit and the forecasting accuracy of the augmented models are superior to those of the baseline models. Whence the opportunity to extend to the tourism sector the surveys on the business sentiment currently realized by the provincial chambers of commerce for the manufacturing sector, allowing an effective and timely managing of local tourism market, where official information is likely to be either lacking or poor in quality.

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1. Introduction and hypothesis

Indexes based on the opinions and expectations of either consumers or professionals are commonly used to model and anticipate the business cycle, industrial production, national economic turning points and price dynamics (see, among others: Anderson, Kellogg, Sallee, & Curtin, 2011; Gelper, Lemmens, & Croux, 2007; Koskinen & Öller, 2004; Taylor & McNabb, 2007).

Business indicators of production and price dynamics are widely used in modelling and forecasting sectoral conjunctural dynamics (see, among others, Jad, 2011; Maurin & Paries, 2008; Pedersen, 2009), due to the advantages of subjective information over quantitative data. Among others: the provision of reliable signals on the short-term evolution of the industry at the firm level, earlier availability, and less need for corrections and revisions (Darne,

2008; Mitchell, Smith, & Weale, 2005). Thus business sentiment indicators (BSIs) are constructed and used by government institutions, chambers of commerce, business associations and institutes of high education throughout the world.

Nonetheless, to the best of our knowledge, BSIs have never been employed in the tourism field.

The great majority of the literature, concerning modelling and forecasting tourism demand, rely on quantitative data (see the surveys of Goh & Law, 2011; Goodwin, 2008; Song & Li, 2008), even though a large body of evidence indicates that the use of exogenous 'hard' variables provides no forecasting improvement (Athanasopoulos, Hyndman, Song, & Wu, 2010; Kulendran & Witt, 2001; Song & Witt, 2000). In particular, Song and Witt (2006) underline the difficulties of correctly specifying econometric models, precisely distinguishing between exogenous and endogenous factors. Wong, Song, and Chon (2006) highlight the problems in forecasting the values of the explanatory variables, not to mention that these variables are often not specifically connected with the tourism dynamics (e.g. the basket of goods consumed by tourists tends to be different from those considered in the

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consumer price indexes calculation; see Divisekera, 2003). Other studies (e.g. Fildes, Wei, & Ismail, 2011), although finding some improvement in the forecasting accuracy through the use of exogenous variables, conclude that pure time series approaches are more likely to be appropriate in the majority of cases. It should also be mentioned that, notwithstanding the growing interest in forecasting methods, the literature has not yet considered supply side information, which could affect market dynamics, other than prices and marketing expenditures (Li, Song, & Witt, 2005).

Swarbrooke and Horner (2001) were among the first to propose to add soft data to the traditional exogenous tourism variables. They stated that business travellers' expectations about a foreign country's economic future and stage of development allow a better explanation of business travel flow. Following these assumptions, some researchers used the opinions of professionals as business-services consumer sentiment indicators (Allen & Yap, 2009; Njegovan, 2005). However, to the best of our knowledge, no conjunctural information from the tourism supply side has ever been employed, in either forecasting or real time prediction of the tourism business cycle, although it has – at least – four advantages over quantitative measures. First, BSIs, are generally able to synthesize the effects of a wide variety of factors, even not economic in nature, on the dynamics of the accommodation production. Literature highlighted: the security conditions of the destination, its climate and natural environment, its demographic characteristics, social and technological factors and psychological and fashion-related issues (see, among others: Dwyer, Mistilis, & Scott, 2009; Hamilton, Maddison, & Tol, 2005; Ryan, 2003). Second, BSIs may allow to measure in real time the impacts of unpredictable one-off events, such as: environmental disasters, wars, earthquakes or changes in the productive destination of a region, on the business cycle (see for example: Athanasopoulos et al., 2010; Chang, Chen, McAleer, Huang, & Kuo, 2008; Huang & Min, 2002), while a more common 'dummy variables approach' (e.g. Claveria & Datzire, 2009), holds only if such events have already been observed, entering the information set. Third, as hotel keepers/managers are (partially) informed about their customers' satisfaction and expectations about local tourism products, BSIs can potentially summarize the impact of territorial policies (e.g. marketing initiatives and/or structural investments). Last but not least, in a sector where official data on tourism demand are provided by hotels keepers/managers, BSIs reflect exactly – in terms of definition – what is measured by the accommodation statistics: the sum of the number of arrivals of both tourists and travellers within their usual environment (Govers, Van Hecke, & Cabus, 2008; Guizzardi & Bernini, 2013). Therefore, hereafter we prefer to use the term 'accommodation production', to which we will also refer as 'tourism production', just for avoiding repetitions.

It should also be stressed that the business sentiment is a subjective, personal assessment of the environment, so the construction of indicators might be affected by strong measurement errors, due to the frequent ambiguity and intrinsic qualitative nature of surveys. Therefore, whether indicators derived from surveys to hotel keepers/managers can be informative about tourism business cycle dynamics is questionable, and investigating it is the aim of the present study.

Thus, the key question posed in this paper is whether and to what extent business sentiment indexes can be informative in modelling and forecasting the tourism production, especially in a small area, where the costs of surveys are low and – more important – official statistics are not able to provide indicators with sufficient territorial detail and timeliness, with respect to the policy makers' needs. If the answer is affirmative, this work will acquire a specific importance for local policy makers, by demonstrating that the subjective evaluations of hotel keepers and managers are useful

to make their decision-making process more effective, allowing a real time knowledge of the market dynamics. To address this issue, we compare and assess the effect of including BSIs in some of the naïve and time series specifications that are usually employed to model or forecast tourism flows. By using residuals and predictive diagnostics, we provide a comparative evaluation of the baseline models vs. the "augmented" ones. Forecasts are assessed based on the results of three cost functions for the prediction errors and some inferential methods. Therefore, the present research makes a contribution to the literature by investigating the explanatory and predictive power of BSIs, within the field of tourism.

We focus on the number of arrivals in the hotels of the province of Rimini, a NUTS 3 leading Italian tourist destination, accounting for 3.1% of the national market in terms of sales of overnight accommodations, with 2130 hotels (the 6.6% of the national market share) and 7% of the national capacity in term of hotel rooms in 2010 (ISTAT, 2011). The BSIs are retrieved from a four-monthly survey, covering the period from April 2000 to December 2012.

The paper is structured as follows. Section 2 presents the business survey, used to obtain BSIs, and the data. The model specifications and estimation results are described in detail in Section 3. Section 4 compares, in both descriptive and inferential terms, the forecasting performances of baseline models with those of the corresponding ones augmented with BSIs. Finally, Section 5 summarizes the main findings of the study and draws some conclusions.

2. The survey and the data

2.1. The OSCAR business survey

We collected information on the sentiments of hotels keepers through a survey performed within the context of the "Osservatorio Statistico sulla Congiuntura Alberghiera Regionale" (OSCAR; in English: Statistical Observatory on the Regional Hotels Conjuncture) activities, a project of the University of Bologna. OSCAR has been performing periodic surveys to assess hotel keepers' (or managers') opinions and expectations, through telephonic interviews, since the pilot survey in August 1999. The results have been published each four-month by the local press. The questionnaire is composed of 4 questions on the respondents' opinions regarding:

- the observed level of their own hotels accommodation production (Ob_t);
- their own hotel's expected production for the next period (Ex_t);
- their own hotel's prices dynamic – net of the inflation – (P_t);
- the trend expected for the near future, with respect to the entire provincial market (Mkt_t).

The survey also requests a subjective evaluation of the effectiveness of public spending, which is routinely made available to local politicians.

Opinions are expressed as 'high', 'low' or 'same', with reference to those which the respondents consider the usual dynamics of the sector and their own enterprise. Quantitative variables for the k -th ($k = 1,2,3,4$) issue are constructed using the net balance statistic, the most commonly used measure for the purpose of nowcasting (see, among others: Aylmer & Gill, 2003; Matheson, Mitchell, & Silverstone, 2010). In particular, each BSI is calculated as the difference between the weighted proportion of firms reporting an increase and those reporting a decrease, rescaled to make it vary between -100 and 100 : $BSI_{m,t} = [\%(high_{m,t}) - \%(low_{m,t})] \cdot 100$. Weights are given by the total number of rooms at the surveyed hotels' disposal. Positive balances tend to be associated with growth in the variable of interest and vice versa.

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