Tourism Seasonality and Hotel Firms' Financial Performance:

Evidence from Norway

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ABSTRACT

This study explores the impact of seasonality on hotel firms' financial performance and whether this impact depends on tourism destinations and the variations of the tourism demand distinguished by domestic market and international market. Financial performance is measured by the most commonly-applied indicator, Return on Assets (ROA), which is further decomposed to profit margin and asset turnover. The present study contributes to the literature by evaluating the importance of pricing strategies and marketing efforts in alleviating the negative effect of seasonal demand. Dynamic panel models at both the national and regional levels are applied to a sample, including the accounting data of all Norwegian hotel firms between 2008 and 2017. Our empirical findings suggest that the impact of seasonality on financial performance depends on market segments and varies across tourism destinations. Additionally, seasonality has a stronger impact on profit margin than on asset turnover, indicating that marketing efforts and pricing strategies can effectively alleviate the negative impact of seasonality.

Keywords: Tourism seasonality, Hotel firms, Profitability, Norway, Dynamic panel model

1. Introduction

Tourism seasonality refers to a repeated cyclical pattern, with year-long temporal imbalances in tourist arrivals, overnight stays, and expenditures (Barros and Sousa, 2019). Although the financial impact of seasonality can be somewhat alleviated with cyclical staffing since salary is a large share of the operating costs, high fixed costs from having large amounts of underutilized assets out of season can severely impact tourism firms' financial performance. These assets are inflexible, and many do not have alternative uses. To uncover the strategies that hotel firms can use to alleviate the negative impact of seasonality on financial performance thus becomes an important empirical task.

Firm performance is composed of operational, financial, and organizational performance. Researchers generally conducted empirical studies on the impact of tourism seasonality on operational and organizational performance. For instance, literature has documented the disadvantages of seasonal demand variations in industry operations, including inefficient capacity utilization, problems in maintaining quality employees due to casual employment, and difficulty in maintaining services and product quality standards (Baum, 1999; Hinch & Jackson, 2000; Pegg, Patterson, & Gariddo, 2012; Falk & Hagsten, 2018; Sainaghi et al., 2019). Although previous literature has also analyzed hotel firm-level profitability (Aissa & Goaied, 2016; Lado-Sestayo et al., 2016), to our best knowledge, few studies have investigated how tourism seasonality affects hotel firm-level profitability.

The financial impact of seasonality can vary across tourism regions. Different seasonal patterns (volatile versus moderate and predictable versus unpredictable) in regions due to demand variances from domestic and international tourists and/or tourist purposes (Perles-Ribes et al., 2018) can affect firms' financial performance in significantly different manners. Furthermore, the effect of seasonality by region may cancel out at an aggregated national level. This is consistent with the phenomenon that homogenous nationwide tourism policies do not work for individual regions, and heterogeneity is always preferred by different destinations (Duro & Turrión-Prats, 2020). Accordingly, in the study, we investigate the impact of tourism seasonality on hotel firms' financial performance, at both the national and regional levels. Furthermore, an overall seasonality index and the other with two disaggregate seasonality indices for domestic market and inbound tourism are applied to represent tourism seasonality.

The main objective of the study is to fill in the literature gap by investigating the impact of the seasonal concentration of tourist arrivals on hotel firms' financial performance.[1] In particular, we test whether the impact of tourism seasonality on financial performance depends on the variations of tourism demand distinguished by domestic and foreign tourists and whether the impact varies across tourism regions. We measure financial performance using the most commonly-applied financial performance indicator, Return on Assets (ROA). ROA is net profit before tax plus interest expenses divided by the average total assets. As suggested, it measures how profitable a company is relative to its total assets. ROA can be broken down into two components, profit margin (which measures a firm's ability to generate profit from sales) and asset turnover (which shows how efficient a company is in generating revenue from its assets). We further analyze the impact of seasonality on these two components separately as we believe it is important for firms to understand the exact causes of the seasonal effects, and thus they can have different targeting strategies. The interplay

[1] Financial performance is directly relative to hotels' competitive advantage and survival probability. Tourism seasonality affects financial performance through its impact on the operation. Analyzing operational performance can reveal the direct consequence of tourism seasonality. However, financial performance is one of the essential concerns for stakeholders like investors. Furthermore, good financial performance is a precondition for sustainable tourism.

between profit margin and asset turnover, to our best knowledge, has not been investigated in the tourism literature.

The Norwegian tourism industry provides an excellent case study as it offers a vast diversity in tourism regions that might be differently impacted by seasonality due to the differences in tourism segments they target and the attractions they offer. The diversity of the Norwegian tourism market therefore makes the results of the study transferrable to tourism markets in other countries. In addition, the variation in tourism markets within the country also provides the opportunity for the robustness check when it comes to the stability of the results of a national level analysis regarding firm financial performance.

The following sections of this study are organized as follows. It starts with a literature review in section two, followed by a brief discussion of Norwegian tourism in section three. Section four presents the data and variables measured, followed by research methods and the empirical model in section five. Section six reports and discusses the empirical results. The study concludes with a summary of the primary findings and implications.

2. Literature Review

Seasonality is a measure of demand variations on a daily, monthly, or annual base (Sainaghi, 2010; Lado-Sestayo, et al., 2016; Sainaghi et al. 2019). Given the importance of tourism seasonality, researchers have investigated the reasons for seasonal concentration, concluding that climate and institutional characteristics are most crucial (Frechtling, 1996; Lundtorp, Rassing, & Wanhill, 1999; Butler, 2001; Cuccia & Rizzo, 2011; Li et al., 2018) and that at the same time, the economic factors such as tourists' income, travel costs, and socio-demographic characteristics also influence tourism seasonality (Nadal, Font, & Rossello, 2004; Ashrafi and Myrland, 2017; Xie, 2020).

The literature generally confirms the negative impact of seasonality on tourism growth and regional economic development (Pegg, Patterson, & Gariddo, 2012); however, the consequences of tourism seasonality vary across tourist destinations due to the variations in natural seasonality and intensity on a spatial level (Koenig-Lewis & Bischoff, 2005; Cuccia & Rizzo, 2011). The similarities or differences between seasonal demands in domestic and foreign segments may amplify or mitigate the overall seasonal patterns (Garín-Muñoz, 2009). Martín, Aguilera, & Moreno (2014) examined the seasonality pattern in Spain's Andalusia region. They found that seasonal intensity was more vigorous with foreign tourists than domestic tourists and the similarity of the seasonal patterns for foreign and domestic visitors intensified the average seasonality in the region.

Of the three types of firm performance, operating performance measures how firms effectively utility the capacity, organizational performance refers to how firms build up their competitive advantage and remain competitive in response to demand variations and other factors, and financial performance measures how well firms use assets to generate revenue. Operational performance is an important factor impacting financial performance, and organizational performance, such as survival risk, is a consequence of poor financial performance.

Under-utilization of capital assets in the low season is an obstacle to operational performance in the tourism industry (Baum, 1999). Casual employment in the peak season is another obstacle to affect firms operation since casual employers lacking of full competence and high working motivation and engagement often make it difficult for firms to maintain services and product quality standards (Pegg, Patterson, & Gariddo, 2012; Falk & Hagsten, 2018).

In an empirical study by Sainaghi et al. (2019) where they investigated how the Milan World Expo 2015 changed the seasonality pattern of the destination and its impacts on the operational results of local hotel firms. The study results show the event has successfully

reduced the tourism demand variation in a year and consequently significantly improved hotel firms' operation performance in terms of occupancy, average daily rate (ADR), and revenues per available room (RevPAR). Pegg, Patterson, and Gariddo (2012) discussed growing summer tourist arrivals in the Alpine accommodation resorts in Australia, which mitigated the seasonal variation featured by the peak winter season and made the year-round employment possible, and thus motivated staff to raise their work performance.

A constant negative impact of seasonality on hotels' operating performance (and consequently financial performance) undermines hotels organizational performance, regarding their competitive advantage survival probability. Falk and Hagsten (2018) examined how tourism seasonality affects the exit risk for Swedish accommodation establishments. According to their empirical results, the hotel exit risk would increase by 37% following a one standard deviation increase in seasonal demand variations. This result is confirmed by Lado-Sestayo et al. (2016), who documented the level of seasonality is positively associated with the exit risk of Spanish hotels.

The negative impact of seasonality on operational performance implies the negative relationship between tourism seasonality and financial performance. A short business operating season and, consequently, under-utilization of capital assets, which as we have discussed usefully do not have alternative uses in off-peak seasons (Baum, 1999), leads to bad financial performance. Similarly, working capital maintained to meet the requirement in peak seasons has a lower return in off-peak seasons.

Few studies have empirically tested how tourism seasonality affects hotel firms' financial performance. Using a simulation method rather than an empirical model, Georgantzas (2003) found that alleviating tourism seasonality may increase hotel profitability and pricing strategies in response to predictable (and persistent) tourism seasonality improve hotel profitability. Some researchers have empirically investigated hotel firm financial performance; however, they did not consider tourism seasonality. For example, Aissa and Goaied (2016) explored the determinants of hotel profitability in Tunisia and found a positive impact of management efficiency on hotel profitability. Lado-Sestayo et al. (2016) documented that, for Spanish hotels, profit margin depends on market structure and the demand level in tourism destinations. Since the negative impact of seasonality on tourism operation performance has been well documented in the literature as we have reviewed, research is need on its impact on the industry's financial performance. Our study therefore is to fill this literature gap.

3. Norwegian Tourism

Despite its modest size, Norway is rich in spectacular scenery, from stunning fjords to magnificent mountains and glaciers (Xie & Tveteraas, 2020a). Nevertheless, tourism growth in Norway was modest in the last decades due to its low level of price competitiveness as a rich country compared with many other destinations in the world. However, this has significantly changed since 2013 (Xie & Tveteraas, 2020a). As the oil industry dominates the Norwegian economy, the collapse of the oil price starting in mid-2013 and lasting until now has made the Norwegian currency (NOK) significantly depreciated. Consequently, the weak NOK has improved the Norwegian tourism industry's competitiveness and boosted tourism in Norway (Xie & Tveteraas, 2020a and 2020b), which further influenced the season patterns.

According to Statistics Norway (2019), hotel overnight stays in Norway increased from 19.67 million to 23.13 million between 2013 and 2017. During this period, the share of tourist arrivals by purpose is 12.7% for courses/conferences, 37.2% for business travels, and 50.2% for leisure. Looking at tourist origin, domestic tourists are dominant, with a 72.5% market share. However, the annual growth rate between 2013 and 2017 is more significant for the inbound tourism segment than for the domestic segment (5.4% versus 2.4%). These statistical

analyses suggest significant growth in the leisure tourism segment and foreign tourist arrivals, which may affect the seasonality patterns in the individual regions and in Norway in general.

Fig. 1 illustrates the average monthly hotel overnight stays by region and market segment. It shows the peak season extends from June to August in the individual regions and for the whole nation as well, regardless of the tourist origins. Compared with domestic tourists, the international tourists cluster more in the peak season since long-haul travel is more subject to both holiday calendars and the Norwegian climate conditions. At the country level, the monthly share of international tourist overnight stays is 14.2% in June, 17.6% in July, and 15.9% in August, which are higher than the corresponding numbers for domestic tourists. Although the overnight stays of domestic tourists are about one third of international tourists, the significant growth in the international leisure segment indicates a tendency for an even higher seasonal concentration in summer for Norwegian tourism.[2]

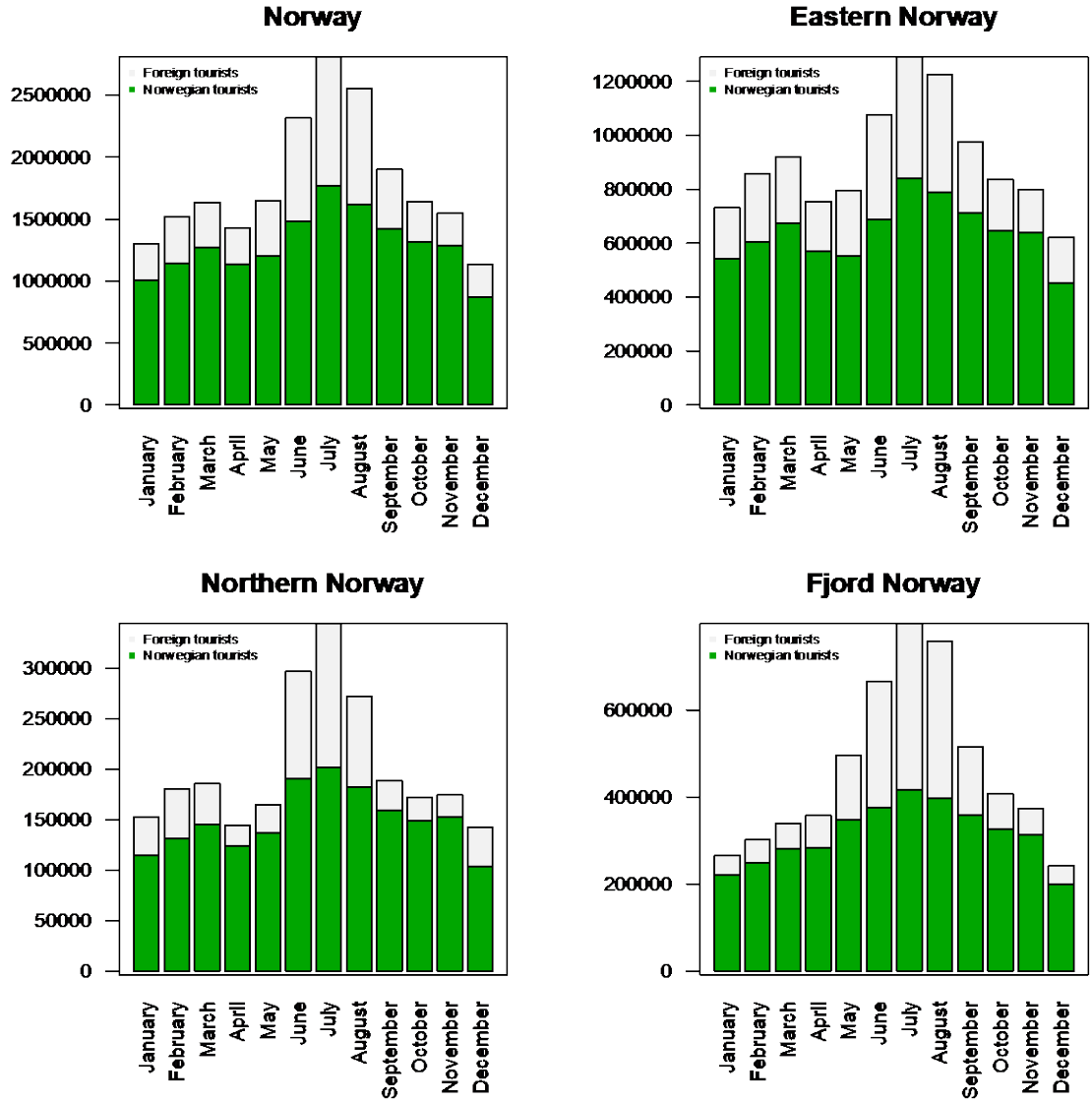

Fig. 1. Average amount of guest hotel overnight stays, by month and region.
Note: EN – Eastern Norway, NN – Northern Norway, FN – Fjord Norway.

[2] Between 2013 and 2017, the share of inbound tourist overnight stays in summer increased from 46.3% to 49.2%.

The seasonal overtourism problem in Norway is particularly apparent in popular summer attractions, such as Naeroyfjord, Trolltunga, and Preikstolen (Oklevik et al., 2019). In response to various issues triggered by seasonal overtourism, Innovation Norway[3] has been cooperating with cruise and air communication companies and local travel agencies to promote winter activities, such as the northern lights on the global market. This has brought more tourists to visit Northern Norway in off-peak seasons (winter), resulting in the year-round tourist demand. For fjordal areas, the government has been pursuing campaigns for year-round tourism, following the growing wintertime interest as a result of the 2013 Disney movie "Frozen" (Oklevik et al., 2019). In the study, we investigate whether the seasonal mitigation has improved the hotel firms' financial performance in the regions.

4. Data and Variable Measurement

4.1. Data

We obtained the hotel firms' accounting data from the Brønnøysund Register Center[4], where all the Norwegian-registered firms submit their financial reports. The dataset includes 4,622 firm-years observations between 2008 and 2017. To measure the seasonal concentration of tourism demand, we obtained the data on monthly hotel overnight stays by province from Statistics Norway (2019). This study focuses on the three primary regions, namely Eastern Norway, Northern Norway, and Fjord Norway. The sum of the hotel guest overnight stays in these three regions accounted for more than 85% of the total overnight stays in Norway during our sample period. Specifically, the average share was 39% for Eastern Norway, 11% for Northern Norway, and 21% for Fjord Norway. This regional distribution delineates distinct tourism regions in Norway. As we discussed above, urban tourism is more concentrated in Eastern Norway, tourism is concentrated in Fjord Norway for its fjords, and tourists looking for the northern lights and the midnight sun head to Northern Norway.

4.2. Measuring profitability

Various measures of financial performance such as economic margin, financial ratios, and metrics related to value and risk-return, are used in the literature (Selling & Stickney, 1989; Goddard, Tavakoli, & Wilson, 2005; Pattitioni et al., 2014; Sainaghi, 2010; Lado-Sestayo et al., 2016). Among them, Return on Assets (ROA) and Return on Sales (ROS) are the most commonly used. As discussed above, ROA measures the net profit before tax plus interest expenses relative to total assets; ROS is the ratio of the operating margin before financial costs and sales taxes. Since seasonality affects capital utilization in off-peak seasons, ROA is a more appropriate measure than ROS for seasonality studies. Accordingly, we follow Goddard, Tavakoli, and Wilson (2005) and Pattitioni et al. (2014) and use ROA to proxy the profitability of hotel firms in Norway. ROA is in the form:

$$ROA = \frac{Net\ profit + Interest\ expense}{Total\ assets} \qquad (1)$$

where interest expense is added to net profit before tax to reflect returns on total assets, regardless of financing sources of those assets. Given that the numerator measures operating income in a year, the denominator is the average total assets in use over the particular year (Selling & Stickney, 1989).

[3] Innovation Norway represents the Norwegian government and regional authorities in stimulating the profitable development of the tourism industry and other economic sectors.

[4] The Brønnøysund Register Center is a Norwegian government agency that is responsible for registered data, including balance sheets, income statements, and firm-specific information.

To investigate the sources of ROA in more detail, we multiply and divide revenue in Equation (1) simultaneously:

$$ROA = \frac{Net\ profit + Interest\ expense}{Revenues} \cdot \frac{Revenues}{Total\ assets} = Profit\_Margin \cdot Asset\_Turnover \quad (2)$$

As shown in Equation (2), ROA is composed of profit margin and asset turnover. Profit margin measures a firm's ability to generate operating profit from sales, while asset turnover indicates how efficient a company is in generating revenue from its assets.

Since total assets are maintained to meet the requirements in peak seasons, they generate low revenues in off-peak seasons, indicating a lower rate of asset turnover. On the other hand, pricing strategies in response to seasonal demand may raise revenues and hence the rate of asset turnover for a given level of total assets. Due to optimal pricing strategies, operational income may increase more than cost, resulting in an increased profit margin and hence a high rate of ROA. Thus, although researchers argue that profit margin and asset turnover change in the same direction (Jansen, Ramnath, & Yohn, 2012), seasonal demand variations may affect the two ratios in opposite directions, resulting in an ambiguous impact of seasonal demand on ROA.

4.3. Measuring seasonality

The Gini index is the most common measure of seasonality used in tourism literature (Fernández-Morales, Cisneros-Martínez, & McCabe, 2016; Duro & Turrión-Prats, 2020), although there are some alternatives such as the Theil index (De Cantis, Ferrante, & Vaccina, 2011) and the coefficient of variation (Turrión-Prats & Duro, 2018). Compared to other measures, the Gini index takes the skewness of the distribution into account and is less affected by extreme values (Cisneros-Martínez & Fernández-Morales, 2015). Recently, Falk and Hagsten (2018) used the index to explore the impacts of seasonal demand concentration on hotel firms' operational and organizational performance. Nevertheless, to check for the robustness, we also followed Turrión-Prats and Duro (2018) and used the coefficient of variation of tourist overnight stays as an alternative measure of tourism seasonality. Since the two measures reveal a similar seasonal pattern, and the estimation results are also not substantially different from each other, we only report the Gini index results in the study. (The results of regressions using the alternative measure are available upon request.)

A Gini index for the hotel guest overnight stays is constructed according to the following formula:

$$Gini_{p,t} = 1 + \frac{1}{n} - \frac{2}{n}\sum_{k=1}^{n} w_k S_{p,t,k} \quad (3)$$

where $Gini_{p,t}$ denotes the tourism concentration for province *p* in year *t*; *n* is the total number of months with a positive number of hotel overnight stays. In this study, *n* equals 12 since there are always some visitors in any month of a given year, regardless of province. $S_{p,t,k}$ ($S_{p,t,1}$, $S_{p,t,2}$…$S_{p,t,12}$) is the share of hotel guest overnight stays in month *k* of year *t* out of the total overnight stays for the year. The monthly shares are ranked in decreasing order according to size. w_k(= 1, 2, 3…) is the weight with the smallest assigned to the month with the largest share, and the second smallest to the month with the second-largest share, and so on. Higher seasonal concentration means larger value for $S_{p,t,1}$, and relatively smaller values for the rest of moths as the sum of market share $S_{p,t,k}$ is 1. As we have discussed, the weights increase from 1 for the largest market share ($S_{p,t,1}$) to 12 for the smallest market share ($S_{p,t,12}$), which means a less skewed distribution of market share ($S_{p,t,k}$) leads to bigger

$\sum_{k=1}^{n} w_k S_{p,t,k}$. Further, since n is a constant (n=12 in the study), larger $\sum_{k=1}^{n} w_k S_{p,t,k}$ means smaller Gini index value. Thus, a small value of Gini index suggests low seasonal variation. The opposite must be also true that a large value of Gini index suggests higher seasonal concentration

4.3.1. Overall Gini index

First, to investigate the impact of the general season concentration, we computed the overall Gini index for Norway and its three regions, regardless of market segments. To compute the Gini index for each region, the hotel overnight stays at the province level have been aggregated to a regional level. Fig. 2 shows Northern Norway used to have the highest level of seasonal demand variations; however, its seasonality has been greatly mitigated in recent years. This suggests Northern Norway has become popular both in summer and winter, as a result of the promotion of the northern lights in the global market (Innovation Norway, 2017; 2018). By contrast, seasonal variation has been amplified over time in Fjord Norway due to significant growth in the leisure segment and a decline in the business segment post-2013 (Xie & Tveteraas, 2020a). The leisure segment is more seasonal compared to the business segment since holiday travel is more subject to institutional patterns such as school or calendar holidays. Of the three regions, Eastern Norway has the lowest level of seasonal concentration, which is likely attributed to the fact that this region is featured by exciting city life, culture, and history rather than by natural features, and that this region has a large number of domestic tourists.

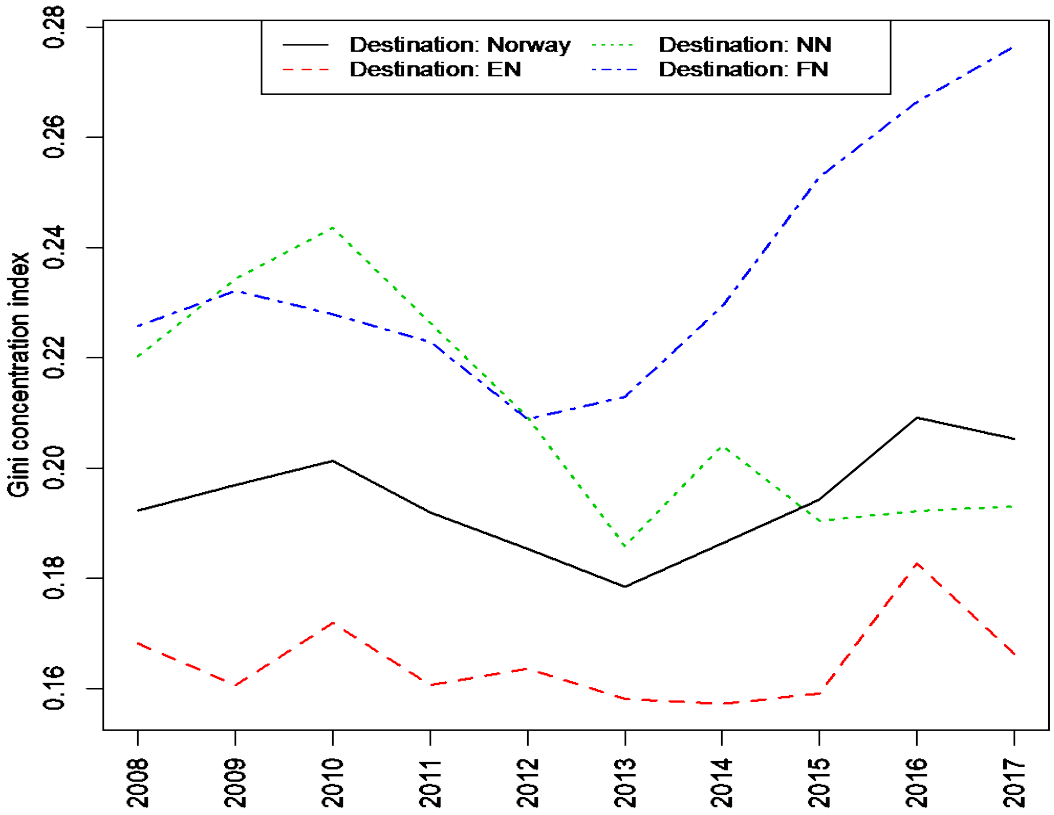

Fig. 2. Gini seasonality index by tourism destination.
Note: EN – Eastern Norway, NN – Northern Norway, FN – Fjord Norway

4.3.2. Gini index for domestic and inbound tourists

To further investigate the seasonality pattern in different market segments, we constructed a separate Gini index for domestic and inbound tourism, as presented in Fig. 3. The figure shows the concentration index for domestic tourists varies from 0.12 to 0.16, while the index for inbound tourists varies from 0.25 and 0.55. This means the concentration degree is much lower in the domestic market than in the international market. The result is expected since domestic leisure tourists usually make more short trips than international leisure tourists. However, Fig. 3 suggests a critical issue, which should not be ignored in the domestic market. Although the concentration degree is small in the domestic market, the high level of index fluctuations for the domestic segment compared to that in the inbound tourism segment suggests that the seasonal pattern in the domestic market is rather challenging to predict. This phenomenon applies to both the individual regions and the whole country.

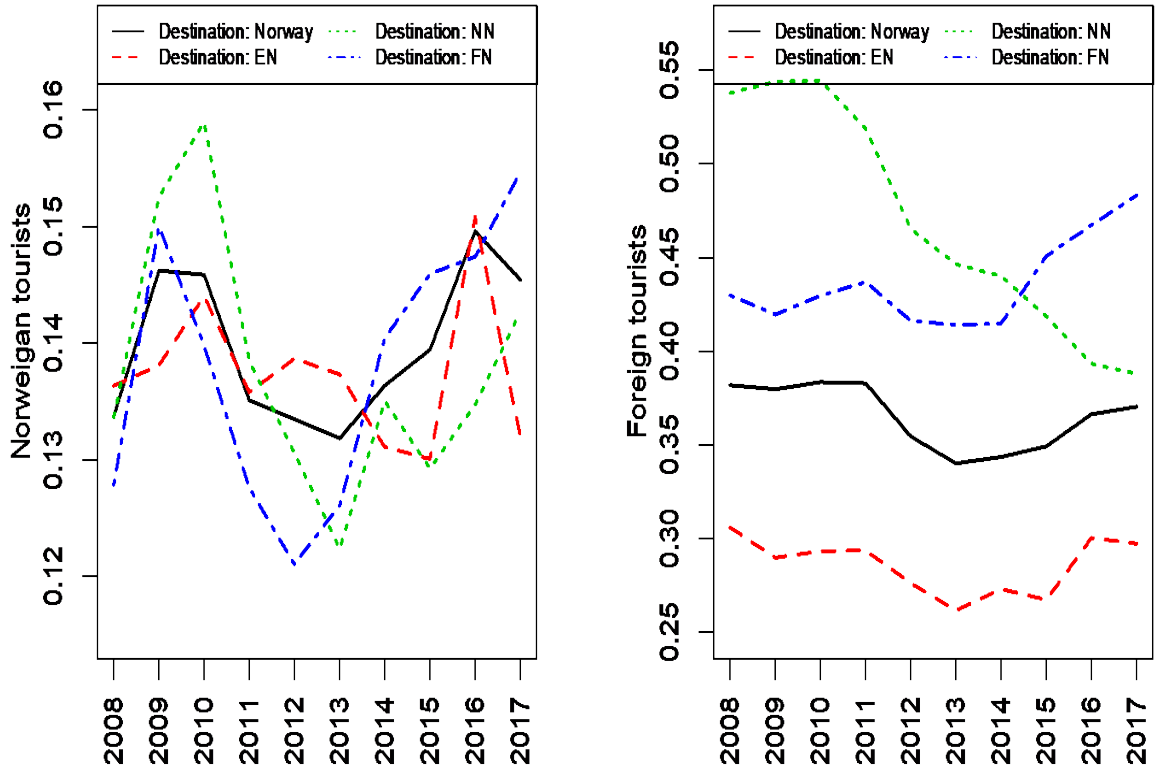

Fig. 3. Gini seasonality index by tourism destination, for Norwegian and foreign tourists. Note: EN – Eastern Norway, NN – Northern Norway, FN – Fjord Norway.

Furthermore, if we put Fig. 2 and Fig. 3 together, the two figures suggest the reduced seasonal changes in Northern Norway are mainly due to the increased arrivals of foreign tourists in the winter, the traditional off-peak season. Fjord Norway's amplified seasonality is attributed to the increasing numbers of leisure tourists from both domestic and international markets in the peak season. In Eastern Norway, tourist arrivals are more predictable in inbound segment than in domestic segment.

5. Empirical Model

5.1. Model specification

When estimating the impact of seasonality on ROA, we need to control for other profitability determinants, henceforth called control variables. Goddard, Tavakoli, and Wilson (2005) argued that a firm's profitability is determined by total assets (*Assets*), market share (*Share*),

the ratio of long-term liabilities to equity (*Gear*), and the ratio of current assets to current liabilities (*Liquidity*). Later, Pattitoni, Petracci, and Spisni (2014) and Lado-Sestayo et al. (2016) proved the ratio of net working capital to total assets (*Working-Capital*) and market competition are also determinants of hotel firms' profitability. Further, we argue as the number of firms (*Firm-Number*) reflects the level of competition, it may affect firms' financial performance as well. We, therefore, have the following Model A:

$$\text{Model A: } ROA_{i,p,t} = \alpha_0 + \alpha_1 ROA_{i,p,t-1} + \sum_{j=1}^{m} \beta_j \boldsymbol{X}_{j,t} + \gamma Gini_{p,t} + d_t + v_i + e_{i,t} \quad (4)$$

where the dependent variable $ROA_{i,p,t}$ is Return on Assets for firm *i* from province *p* in year *t*; $\boldsymbol{X}$ is a vector of the control variables affecting profitability, as discussed above; $Gini_{p,t}$ is the Gini concentration index for province p in year *t*, as defined by Equation (3); d_t captures time effects; v_i controls for the individual firm effects; $e_{i,t}$ is the error term. $ROA_{i,p,t-1}$ in the model is the lagged dependent variable of the model. The model is, therefore, a dynamic panel model, as initially proposed by Arellano and Bond (1991) [5]. The dynamic panel model is preferred in this study since firm profitability is persistent over time.

In order to test the individual impacts of seasonality for domestic and foreign tourists, we modify Model A by replacing the variable, *Gini*, with the indices distinguished by tourist origin. Therefore, we obtain Model B:

$$\text{Model B: } ROA_{i,p,t} = \alpha_0 + \alpha_1 ROA_{i,p,t-1} + \sum_{j=1}^{m} \beta_j \boldsymbol{X}_{j,t} + \gamma_1 GiniDomestic_{p,t} + \gamma_2 GiniForeign_{p,t} + d_t + v_i + e_{i,t} \quad (5)$$

where $Gini\_Domestic_{p,t}$ and $Gini\_Foreign_{p,t}$ are the Gini index for domestic and foreign tourism segments, respectively.

As discussed, the seasonal effects on firms' ROA can be decomposed to the effects on firms' profit margin (*PM*) and assets turnover (*AT*) separately. To investigate the decomposed effects, Models A and B are modified to:

$$\text{Model C: } PM_{i,p,t} = \alpha_0 + \alpha_1 PM_{i,p,t-1} + \sum_{j=1}^{m} \beta_j \boldsymbol{X}_{j,t} + \gamma Gini_{p,t} + d_t + v_i + e_{i,t} \quad (6)$$

$$AT_{i,p,t} = \alpha_0 + \alpha_1 AT_{i,p,t-1} + \sum_{j=1}^{m} \beta_j \boldsymbol{X}_{j,t} + \gamma Gini_{p,t} + d_t + v_i + e_{i,t} \quad (7)$$

$$\text{Model D: } PM_{i,p,t} = \alpha_0 + \alpha_1 PM_{i,p,t-1} + \sum_{j=1}^{m} \beta_j \boldsymbol{X}_{j,t} + \gamma_1 Gini\_Domestic_{p,t} + \gamma_2 Gini\_Foreign_{p,t} + d_t + v_i + e_{i,t} \quad (8)$$

$$AT_{i,p,t} = \alpha_0 + \alpha_1 AT_{i,p,t-1} + \sum_{j=1}^{m} \beta_j \boldsymbol{X}_{j,t} + \gamma_1 Gini\_Domestic_{p,t} + \gamma_2 Gini\_Foreign_{p,t} + d_t + v_i + e_{i,t} \quad (9)$$

5.2. Estimation methods

For the dynamic panel data model, there are unobserved time-invariant firm effects (Greene, 2017). In other words, the lagged ROA is correlated with v_i and/or $e_{i,t}$. Thus, the ordinary least squares (OLS) approach generates biased and inconsistent estimates unless the data cover an extended time period (Turrión-Prats & Duro, 2018). Since our data has a large cross-sectional (firms) and a small time-series dimension (years), the generalized method of moments (GMM) approach is applied. When estimating the dynamic panel model, the lagged levels of dependent variables and the differenced-independent variables are used as the

[5] As recently pointed out by Turrión-Prats & Duro (2018, p. 26), "To the best knowledge of the authors, the use of this particular methodology for the empirical analysis of tourism seasonality is new." Lado-Sestayo et al. (2016) applied the dynamic panel model to investigate the profitability determinants of hotel firms in Spain.

instrument variables (Goddard, Tavakoli, & Wilson, 2005; Turrión-Prats & Duro, 2018). The validity of these instrument variables is tested using Sargan tests of overidentifying restrictions. For the first differenced GMM estimation, d_t and v_i in the models are excluded in the final estimation. Controlling for firm-specific and time effects in a more parsimonious way is another advantage of the dynamic panel model (Greene, 2017, p. 543).

5.3. Descriptive statistics

Table 1 lists the variable definitions and summary statistics.[6] On average, the value of ROA for the Norwegian hotel firms is about 5.3%. The standard deviation of ROA is about four times its mean, indicating a considerable variance in the firms' financial performance. Firm heterogeneity is shown in the descriptive statistics of total assets (a proxy of firm size) and financial ratios, noting the large standard deviation relative to the corresponding mean. For each region, the small average market share accompanied by a large number of firms indicates a high level of competition. For the whole country, *Gini-Foreign* is over two times *Gini-Domestic*, suggesting more severe seasonal changes for inbound tourism, in line with the pattern revealed by Fig. 3. Of the three regions, the difference in the seasonality from domestic tourists (*Gini-Domestic*) is marginal; however, Northern Norway and Fjord Norway have a more volatile demand from inbound tourists (*Gini-Foreign*) than Eastern Norway.

[6] Since the lagged dependent variable is used in the model, data analysis and descriptive statistics are based on the 2009–2017 data.

Table 1

Variable description and summary statistics for the whole sample and regions

		Norway		Eastern Norway		Northern Norway		Fjord Norway	
Variable	Definition	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ROA	Net profit before tax plus interest expense / total assets	0.053	0.229	0.035	0.237	0.062	0.219	0.061	0.212
Profit-Margin (PM)	Net profit before tax plus interest expense / Revenues	0.701	44.28	1.689	70.35	0.066	2.084	0.059	3.426
Asset-Turnover (AT)	Revenues / Total assets	2.057	1.675	2.159	1.643	2.042	1.919	1.846	1.504
Assets	Total assets, in NOK 1000s, in logarithm	8.744	1.355	9.055	1.500	8.268	1.140	8.759	1.223
Gear	Long-term liability / equity	4.650	30.60	4.235	17.54	7.105	64.02	4.324	17.88
Liquidity	Current assets / current liabilities	1.953	6.069	1.791	3.373	2.475	11.812	2.052	5.258
Working-Capital	(Current assets - current liabilities) / total assets	0.082	0.268	0.057	0.280	0.111	0.243	0.088	0.265
Market-Share	A firm's operation income / total income of hotels in the county	0.030	0.052	0.040	0.069	0.019	0.022	0.022	0.038
Firm-Number	Number of firms by county, in logarithm	4.492	0.408	4.397	0.435	4.454	0.387	4.660	0.187
Gini	Gini concentration index for total guest overnights	0.195	0.071	0.165	0.045	0.208	0.064	0.238	0.086
Gini-Domestic	Gini concentration index for domestic guest overnights	0.140	0.050	0.137	0.052	0.137	0.042	0.139	0.045
Gini-Foreign	Gini concentration index for foreign guest overnights	0.364	0.126	0.286	0.078	0.464	0.104	0.439	0.134

Table 2 below reports the correlation coefficients of the variables for the whole country.[7] *ROA* is positively correlated with *Liquidity*, *Working-Capital*, and *Firm-Number*, and negatively correlated with *Assets*, *Gear*, and *Market-Share*. *ROA* is associated negatively with *Gini-Domestic* and positively with *Gini-Foreign*, which leads to a moderate correlation between *ROA* and the overall *Gini* index. The moderate correlation might indicate the overall seasonality effect is not significant for the whole Norway, but it does not necessarily mean it has no effect in each region since the seasonality effects vary across tourism destinations (Baum, 1999). Furthermore, correlation does not equal causation. The impact of the Gini concentration index and the other control variables on ROA may vary from region to region. At the country level, the correlation between *Gini-Domestic* and *Gini-Foreign* is only 0.33, indicating the different seasonal patterns for the domestic tourism and the inbound tourism.

[7] The correlation relationship matrix for each region is not substantially different from the one for the whole sample.

Table 2
Correlations between variables in the model for the whole sample

	ROA	PM	AT	Asset	Gear	Liquidity	Working-Capital	Market-Share	Firm-Number	Gini	Gini-Domestic	Gini-Foreign
ROA	1	0.028	0.072	-0.060	-0.037	0.013	0.155	-0.033	0.052	-0.005	-0.027	0.034
PM		1	-0.019	0.003	-0.001	0.008	0.014	-0.009	-0.028	-0.008	0.004	-0.021
AT			1	-0.375	-0.074	-0.109	-0.032	0.11	-0.053	-0.138	-0.064	-0.126
Asset				1	0.030	-0.031	-0.238	0.476	0.008	-0.121	-0.166	-0.151
Gear					1	-0.003	-0.017	-0.013	0.001	0.032	0.031	0.040
Liquidity						1	0.246	-0.059	0.031	0.062	0.034	0.067
Working-Capital							1	-0.139	0.074	0.062	0.040	0.097
Market-Share								1	-0.234	-0.016	0.071	-0.128
Firm-Number									1	0.162	-0.131	0.403
Gini										1	0.751	0.800
Gini-Domestic											1	0.330
Gini-Foreign												1

6. Empirical Results

The estimation results of Model A and B are presented in Table 3 and Table 4, respectively. For each model, there are regressions, for the whole country, Eastern Norway, Northern Norway, and Fjord Norway. The regression diagnostics show that, for all the regressions, we firmly reject the existence of over-identification (Sargan test) and second-order autocorrelation (AR (2)). The Wald test results for the time dummies and the joint significance of all the variables are firmly significant for all the regressions. Above all, the results of the regression diagnostics indicate the validity of the model specification and the precision of the GMM estimators.

Table 3
Estimation results of Model A (dependent variable: ROA)

	Norway		Eastern Norway (EN)		Northern Norway (NN)		Fjord Norway (FN)	
Variable	Estimate	Robust se	Estimate	Robust se	Estimate	Robust se	Estimate	Robust se
ROA_{t-1}	0.1374 ***	0.0276	0.1906 ***	0.0355	0.0081	0.0192	0.1096 ***	0.0210
Assets	0.1549 ***	0.0211	0.1466 ***	0.0372	0.0735 **	0.0322	0.1821 ***	0.0261
Gear	-0.0004	0.0004	-0.0003	0.0003	-0.0054 ***	0.0003	0.0000	0.0002
Liquidity	-0.0003	0.0003	-0.0035 ***	0.0014	0.0001	0.0001	-0.0003	0.0008
Working-Capital	0.3079 ***	0.0348	0.2604 ***	0.0535	0.2730 ***	0.0545	0.3050 ***	0.0332
Market-Share	0.8374	0.6038	0.2042	0.4712	5.0901 ***	1.5356	2.9564 ***	0.8527
Firm-Number	0.0377	0.0747	-0.1449	0.1052	0.2935 **	0.1401	0.1518	0.1434
Gini	0.0281	0.2039	-0.6902 **	0.3056	-0.9649 *	0.6008	0.1610	0.4971
Sargan test	49.172		51.168		37.749		37.584	
AR(2)	0.4468		1.4636		-0.3751		0.7352	
Wald test for time dummies	46.172 ***		45.066 ***		31.675 ***		34.079 ***	
Wald test for coefficients	188.92 ***		100.97 ***		992.51 ***		337.40 ***	
Observations	4622		1827		796		1351	

Note: ***, **, and * denote significant at the 1%, 5%, and 10% levels, respectively.
Sargan test for over-identifying restriction with the null hypothesis of non-existence of overidentification.
AR(2) test with the null of zero second-order serial correlation.

Table 4
Estimation results of Model B (dependent variable: ROA)

	Norway		Eastern Norway (EN)		Northern Norway (NN)		Fjord Norway (FN)	
Variable	Estimate	Robust se	Estimate	Robust se	Estimate	Robust se	Estimate	Robust se
ROA_{t-1}	0.1368 ***	0.0276	0.1939 ***	0.0362	0.0111	0.0195	0.1029 ***	0.0214
Assets	0.1551 ***	0.0211	0.1438 ***	0.0369	0.0687 **	0.0325	0.1824 ***	0.0264
Gear	-0.0004	0.0004	-0.0003	0.0003	-0.0054 ***	0.0003	0.0001	0.0002
Liquidity	-0.0003	0.0003	-0.0034 **	0.0015	0.0001	0.0001	-0.0003	0.0008
Working-Capital	0.3094 ***	0.0347	0.2489 ***	0.0537	0.2736 ***	0.0542	0.3033 ***	0.0341
Market-Share	0.8344	0.6033	0.2821	0.4787	5.2185 ***	1.5126	2.9585 ***	0.8193
Firm-Number	0.0315	0.0758	-0.1543	0.1044	0.1384	0.1633	0.2220 *	0.1372
Gini-Domestic	-0.0305	0.2342	-0.9724 ***	0.3417	-0.9676 **	0.4744	0.4400	0.3662
Gini-Foreign	0.0132	0.1295	0.3439 **	0.1784	-0.1295	0.3280	-0.4515 *	0.2437
Sargan test	49.345		51.345		37.592		38.454	
AR(2)	0.4441		1.4872		-0.2447		0.3751	
Wald test for time dummies	46.962 ***		51.413 ***		21.907 ***		41.314 ***	
Wald test for coefficients	190.39 ***		102.97 ***		815.87 ***		340.80 ***	
Observations	4622		1827		796		1351	

Note: ***, **, and * denote significant at the 1%, 5%, and 10% levels, respectively.
Sargan test for over-identifying restriction with the null hypothesis of non-existence of overidentification.
AR(2) test with the null of zero second-order serial correlation.

6.1. Overall effect of seasonality on ROA

We first present the results from estimating Model A – the model that does not distinguish between foreign and domestic tourists when it comes to seasonality. As shown in Table 3, the overall Gini seasonality index (*Gini*) is not significant for whole Norway and Fjord Norway, but significant for Eastern and Northern Norway, indicating supportive evidence for the hypothesis that the seasonality effects vary across tourism destinations and accommodation firm locations (Baum, 1999). Therefore, the results highlight the importance of analyzing the effect of seasonality on profitability at the regional level, as regional seasonality may cancel out at an aggregated national level. This also means that heterogenous regional strategies instead of homogenous nationwide tourism policies should be considered in improving hotel firms' financial performance. The negative coefficients of the Gini index in the regressions for Eastern and Northern Norway suggest a negative seasonality–profitability relationship in those two regions. Specifically, for a 0.01 unit increase of the Gini concentration index, the average profitability of hotel firms in Eastern and Northern Norway would decrease by 0.69% and 0.97%, respectively.

Contrary to our expectations, high tourism seasonality in Fjord Norway does not reduce firm profitability. An explanation for this might be, as we have discussed, that Fjord Norway has a growing share of international leisure tourists, and that their seasonal pattern is relatively predictable. In this region, hotel firms' operational and marketing strategies for aligning the seasonal patterns have likely reduced the negative impact of seasonality, in line with the empirical findings of case studies from other countries (Georgantzas, 2003; Pegg, Patterson, & Gariddo, 2012).

Of the control variables, many are significant in the regressions and are in line with theoretical expectations. For the four regressions, the lagged *ROA*, *Assets*, and *Working-Capital* are all significant, except for the lagged *ROA* in the regression for Northern Norway. The significant coefficients of the lagged *ROA* indicate that hotel firms are consistently profitable in recent years. The coefficient of *Assets* in Northern Norway is about half of that in the other two regions, implying that the small players in Eastern and Fjord Norway face intense competition. The estimated coefficients of *Working-Capital* are all significant in the regressions, indicating the positive contribution of human capital to hotel firms' financial performance. This also means that the ineffective use of working capital may lead to poor financial performance. The degree of liquidity only negatively affects profitability for firms in Eastern Norway. A high ratio of long-term liabilities to equity (*Gear*) reduces the financial performance of hotel firms in Northern Norway. Firms with a significant market share have better financial performance in Northern and Fjord Norway, indicating that large firms are more profitable than small firms. The number of firms in the region is positively associated with their profitability in Northern Norway, which may relate to a positive agglomeration effect of a pleasant business environment and knowledge sharing in this region.

Using the estimation results of the Gini index from Model A, we evaluated how changes in seasonality have contributed to hotel firm profitability in Eastern and Northern Norway. We split our sample into two relatively equal sub-periods: 2009–2013 and 2014–2017. Between these sub-periods, the Gini index increased by 0.003 units for Eastern Norway and decreased by 0.025 units for Northern Norway. Multiplying changes in the Gini index by the estimated coefficient of *Gini* from Model A (-0.6902 for Eastern Norway and -0.9649 for Northern Norway) yielded the average effect of changes in seasonal variations on firms' profitability in each region, which is -0.26% for Eastern Norway and 2.40% for Northern

Norway.[8] During the two sub-periods, the average annual ROA of the hotel firms increased by 5.52% in Northern Norway. This means the mitigation of seasonality has dramatically contributed to the significant growth in hotel firms' financial performance in Northern Norway. Therefore, it is evident that a more stable tourism demand throughout the year can substantially contribute to hotel firms' financial performance.

6.2. Effect of seasonality in domestic and inbound segments on ROA

Model B investigates the decomposed effects of seasonality caused by domestic tourism and inbound tourism. As shown in Table 4, regarding the control variables, the estimation results in Model B are close to those in Model A, implying the robustness of the model specification.

The Gini index split does not change the conclusion that seasonality generally has no effect on firms' profitability at the country level. This is in line with the proposition that, on the national level, seasonality in tourism does not necessarily negatively impact the main economic indicators of tourism (Pulido-Fernández, Andrades-Caldito, & Sánchez-Rivero, 2015). However, at the regional level, the estimated coefficients of *Gini-Domestic* indicated that the seasonality of domestic tourists hurts firms' profitability in Eastern and Northern Norway. As shown in the left panel of Fig. 3, although the seasonal concentration is not high in the domestic market, it is rather challenging to be predicted due to its high year-to-year volatility. Unpredictable demand is difficult for any firm to manage. Demand variations in the domestic market have, therefore, a significantly negative impact on a firm's profitability.

The regressions provide relatively more mixed results for *Gini-Foreign*. *Gini-Foreign* is significant and positive for Eastern Norway, insignificant for Northern Norway, and significant and negative for Fjord Norway. The positive effect in Eastern Norway might be related to the proposition in the literature that high seasonality leads to an increase in prices in times of increased activity, thereby improving firm performance (Cuccia & Rizzo, 2011). At the same time, the moderate degree of seasonal demand variances for foreign tourists in Eastern Norway might be relatively more straightforward for firms to adjust their management. Given that Northern Norway offers exciting experiences such as the northern lights, whale safaris, and polar bears in the relative low season of winter, and that tourists seeking excitement spend more money than those preferring stability (Wang et al. 2006), high expenditure thus may have mitigated the overall negative effect of seasonality in Northern Norway. Moreover, the seasonal pattern of international tourists is relatively stable across years and therefore is easier for firms to predict and manage. The negative and significant coefficient of *Gini-Foreign* in Fjord Norway indicates a negative impact of variations in foreign tourist flows on ROA. Although the pattern of international tourist arrivals is predictable in this region, the sheer scale of the foreign tourist demand in the peak season (see Fig. 2 and Fig. 3) implies an insufficient use of investment for firms in off-peak seasons and hence weak financial performance.

6.3. Effect of seasonality on profit margin and asset turnover

Tourism seasonality can affect ROA through its impact on profit margin and/or asset turnover, as illustrated by Equation (2). The effects of seasonality on these two components are estimated by Model C and Model D, respectively. We summarize the estimation results for the overall Gini index and the indices for domestic and foreign tourists in Table 5. To save space, we have omitted the estimated results of the other variables. The full estimation results

[8] Taking the significant coefficient of the lagged dependent variable into account, we calculated the long-term effect of seasonality by dividing the coefficient of *Gini* by (1 – coefficient of the lagged *ROA*) yields. This is -0.852. Using this long-term effect of seasonality, the reduction of profitability for hotels in Eastern Norway due to seasonality changes is about 0.26%.

are available upon request. For comparison, Table 5 also includes the estimation results of the Gini indices from the ROA models presented in Table 4.

In Table 5, the right-side panel shows the impact of the overall Gini index, *Gini-Domestic*, and *Gini-Foreign* on asset turnover. In general, seasonality does not affect hotel firms' asset turnover, except for in Northern and Fjord Norway, where the volatile demand of foreign tourists reduces hotel firms' asset turnover.

The middle panel in Table 5 presents the estimated impacts of Gini indices on profit margin. The overall Gini index and the indices by tourism segment generally have a significant effect on profit margin. Specifically, in Eastern Norway, the positive impact of *Gini-Foreign* and the negative impact of *Gini-Domestic* offset each other, which leads to an insignificant effect of the overall Gini index on profit margin. The negative impact of both *Gini-Domestic* and *Gini-Foreign* in Northern Norway is consistent with the negative impact of *Gini* on profit margin. In Fjord Norway, *Gini-Domestic* and *Gini-Foreign* have an opposite sign; however, the positive *Gini-Domestic* dominates the joint effects, as evidenced by the positive coefficient of *Gini*, the overall index.

Table 5
Estimated impact of seasonality (overall *Gini*, *Gini-Domestic*, and *Gini-Foreign*) on ROA, profit margin, and asset turnover, by region.

	ROA Model			Profit-Margin Model			Asset-Turnover Model		
	Overall Gini	Gini-Domestic	Gini-Foreign	Overall Gini	Gini-Domestic	Gini-Foreign	Overall Gini	Gini-Domestic	Gini-Foreign
Norway	0.0281	-0.0305	0.0132	0.320 ***	0.2890	0.0951	0.7322	0.7105	-0.1863
Eastern Norway	-0.6902 **	-0.9724 ***	0.3439 **	-0.200	-0.3590 *	0.3203 **	0.1132	-0.5052	0.5386
Northern Norway	-0.9649 *	-0.9676 **	-0.1295	-1.461 ***	-1.5019 ***	-1.2780 ***	-0.0012	-0.2514	-1.2280 *
Fjord Norway	0.1610	0.4400	-0.4515 *	0.893 ***	0.9653 ***	-0.2568 *	-0.4493	-0.1452	-1.9244 ***

Note: ***, **, and * denote significant at the 1%, 5%, and 10% levels, respectively.

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7. Discussion

Tourism seasonality due to natural attractions and institutional systems is well recognized as a critical issue for the global tourism industry. Tourism firms with strong financial results perform better environmentally as they are better able to allocate resources to environmentally friendly initiatives (Jackson, Singh, & Parsa, 2015). Therefore, financial performance is also a critical factor influencing sustainable tourism (Qiang, 2020). Many studies have documented the negative effects of seasonality on tourism firms' operational and organizational performance; however, little attention is given to the impact of seasonality on hotel firms' financial performance. This study tried to fill this gap in the literature. In particular, we tested whether the impact of seasonality on financial performance depends on the variations in demand distinguished by domestic and foreign tourists and whether the seasonal impact varies across tourism destinations.

The estimated results of this study show a negative impact of seasonality on hotel firms' profitability generally. This statement is further supported by the simulation results. The reduction in seasonality between the periods of 2009-2013 and 2014-2017 in Northern Norway has led to an average 2.4% increase in the profitability for hotel firms there. The estimated results also support the previous literature in that the seasonality effects vary significantly across different tourism destinations and different market segments (Baum, 1999). These findings may be predictable, as discussed in the literature; however, the study provides some new findings as follows.

First, the predictable volatile seasonality is better than unpredictable modest seasonality for firms' profitability as suggested by the estimated result of *Gini-Domestic* and *Gini-Foreign* in the model for both Eastern Norway and Northern Norway. Second, when the seasonality is predictable but with a high level of fluctuations within a year, inadequate use of capacity in the off-peak season undermines profitability. This conclusion is supported by the estimated result of *Gini-Foreign* in the model for Fjord Norway. Third, a high price in response to high demand in peak seasons raises income, which significantly mitigates the negative seasonal effects, as supported by the estimated result of *Gini-Foreign* in the model for both Eastern and Northern Norway. Last, the effect of seasonality on profitability (ROA) is mainly through its impact on profit margin rather than asset turnover.

There are several implications of this study. Methodologically, the study suggests the importance of investigating the seasonal effect at a disaggregated level, since as documented by our findings, regional effects of seasonality canceled out at a national level. Second, the different components that constitute tourism seasonality should be analyzed separately, as a biased result might be given by analyzing the aggregate measure.

The study also provides significant industrial and policy implications. The hotel industry that seeks to reduce the negative impacts of seasonal tourism needs to adopt pricing strategies in response to demand variations. Price discriminating against customers in different market segments and dynamic pricing following demand variation in different days and seasons are focuses in hotel and tourism revenue management literature, as discussed in the two recent review papers by Guillet and Mohammed (2015) and Vives, Jacob and Payeras (2018).

Our empirical results indicate that, for the two components of ROA, tourism seasonality has a much stronger impact on profit margin than on asset turnover, indicating marketing efforts and pricing strategies in response to seasonality are a useful approach to mitigating the negative effects of the seasonal variation of tourist arrivals. Our findings coincide with Oklevik et al.'s (2019) proposition that the negative impact of seasonal overtourism can be effectively reduced by segmenting specific markets and focusing on those with high net income, lower sensitive price responses, high spending per day, and greater length of stay.

Promoting the attractiveness of tourist destinations in off-peak seasons enhances hotel firms' financial performance in addition to alleviating the widely discussed problem of seasonal overtourism. This further confirms the statement in recent research within the field of sustainable tourism that financial performance and environmental performance are not necessarily a tradeoff. If sustainable tourism firms focus on the right customer segments, there is a potential for increased profitability (Moeller, Dolnicar, & Leisch, 2011; Gössling et al., 2016).

Despite the significant contributions, this study has some limitations, which present future research directions. First, considering the diversity of tourism by country and the complexity of economic issues at both country and firm levels, more studies on the relationship between tourism seasonality and hotel firms' financial performance should be done at the tourism region level in different countries. A multi-country study is needed to test the generalization of the empirical findings. Second, this study treats foreign tourist as a whole. There are probably differences in seasonal demand, preference for tourism attractions, and spending sensitivity for tourists from different countries or regions (Chen & Pearce, 2002; Xie & Tveteraas, 2020b). A follow-up study on the impact on financial performance of tourism seasonality by source country (or country group) can provide more accurate implications for the tourism industry. Third, we derived the implications of the empirical findings regarding marketing efforts and pricing strategies. Some special events, for example, mega winter sporting events in Norway, may attract tourists with a longer stay and more spending. It might also change tourists' preference for destinations. As such, future studies can be conducted on how special events mitigate seasonal demand variation and financial performance.

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