Determinants of capital structure in the hospitality industry:

Impact of clustering and seasonality on debt and liquidity

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Abstract

Volatile seasonal demand and geographic clustering of firms are two important factors affecting the capital structure of hospitality firms. In this paper, we investigate the determinants of capital structure of hospitality firms with emphasis on the effects of seasonality and firm clustering. A fixed-effects panel data model was estimated using data on all hospitality firms in Norway from 2008 to 2018. Our empirical findings reveal that the seasonality created by foreign tourists increases the share of long-term debt in firms' capital structure. Further, the clustering of hospitality firms in a region enhances firms' reliance on short-term debt. Firms' liquidity is negatively associated with the degree of clustering, suggesting that greater competition drains cash and short-term debt serves as a substitute. These findings have important implications for financial management by firms in the hospitality industry as the degrees of seasonality and clustering significantly affect the financing of assets and liquidity management.

Keywords: capital structure, financial management, hospitality industry, seasonality, firm clustering

Declarations of interest: none

1. Introduction

Early capital structure theories (Modigliani & Miller, 1958, 1963; Jensen & Meckling, 1976; DeAngelo & Masulis, 1980; Myers, 1977, 1984; Myers & Majluf, 1984) assume that firm-level financing structure is independent of industry characteristics. However, given the considerable differences across many industries in terms of the operations of their firms and supply and demand throughout the operating cycle, it is unlikely that the capital structure theories are applicable to all industries, not least the hospitality industry, consisting primarily of hotels and restaurants[1]. As a result, the capital structure of hotel and restaurant firms may well depend on industry characteristics.

Importantly, while the hospitality industry is unique in many respects, volatile seasonal demand and the geographic clustering of firms may well be two of the more important factors affecting the capital structure of its firms. First, tourism seasonality creates imbalances in the number of tourists, hotel overnight stays, and expenditures (Barros & Sousa, 2019), resulting in underutilized assets out of season if the design of firm capacity is to meet peak demand. For example, recent work by Zhang et al. (2020) provides evidence that seasonality affects the firm-level profitability of hotels and restaurants. Furthermore, it is also likely that seasonality influences capital structure beyond its effect on profitability, given that investors and creditors may view a firm facing cyclical demand as riskier.

[1] Hall, Hutchinson and Michaelas (2010) show that there are industry differences when it comes to capital structure. Furthermore, Sheel (1994) investigates debt behavior in hotel- and manufacturing firms and finds important differences between the two industries.

Second, industry clustering, defined as the geographic concentration of interrelated firms (Porter, 1998), may also have a role to play in capital structure. Firms within a cluster can benefit from their advantages in information and knowledge sharing, access to public goods, and from synergies arising from specialization within the cluster (Porter, 1990). Accordingly, clustering should positively affect firm performance. However, increased rivalry within the cluster can also negatively affect the economic performance of its constituent firms (Marco-Lajara et al., 2014). This is particularly true for the service industry where demand is largely constrained within an area, and product differentiation (e.g., among hotels and among restaurants) is relatively small compared to that in the manufacturing industry. Consequently, hospitality firms within a cluster may face high competition when it comes to both attracting tourists and capital.

Moreover, if the available menu of financing options for hospitality firms depends on industry characteristics, these characteristics become important input variables in the financial management process. They may then influence whether firms finance new investments with long- and/or short-term debt and/or equity. Given that the impact of seasonality and clustering on liquidity is an important consideration for firms' financial managers, the results of our econometric analysis are important for not only academic inquiry into capital structure, but also the day-to-day operations of firms in the hospitality industry. To the best of our knowledge, there has been hitherto no comparable investigation in the literature into how tourism seasonality and clustering influence liquidity in the hospitality industry.

For the empirical analysis, we have used the Norwegian hospitality industry data. Norway is a high-cost destination given the prevailing level of prices (Xie & Tveterås, 2020a). However, the destination's price competitiveness has greatly improved in the last few years following the significant depreciation of the Norwegian krone (NOK). As discussed in Xie & Tveterås (2020a, b), the Norwegian economy is highly dependent on oil exports, and thus the oil price crisis in 2014 has dragged down the value of the NOK. This has made it cheaper for foreigners to visit Norway and more expensive for Norwegians to travel abroad, resulting in a boom in the Norwegian tourism industry. The annual growth rate measured by the number of hotel overnight stays was 1.9% and 4.0% before and after the oil crisis, respectively (Xie & Tveterås, 2020a).

The data employed in the study are financial data on all Norwegian lodging, restaurant, food, and beverage firms. As none of the firms in the hospitality industry in Norway are listed on a stock exchange, all the firms included in the sample are private firms. The data comprise 25,540 firm-year observations for 5,474 companies operating in the period 2008–2018. Provided by the econometric model with both firm, year, and regional fixed effects, our results indicate that while seasonal demand from international tourists increases a hospitality firm's long-term debt, a high degree of clustering in a region makes a firm more reliant on short-term debt. One reason could be that liquidity is lower for firms located in a region with a denser clustering, indicating that competition drains cash and short-term debt serves as a substitute. This potentially increases default risk of the firms within a cluster.

Overall, the results suggest that we should augment the classical theory of capital structure by incorporating industry characteristics to make the theory applicable to the hospitality industry. An important practical implication is that hospitality firms should adapt their financial management process according to the degree of seasonal tourism concentration and the cluster effect in their region, as we demonstrate that these factors significantly influence the menu of financing options for firms and their day-to-day liquidity needs.

This paper contributes to the literature by being the first to investigate how seasonality and firm clustering influence capital structure in the hospitality industry. To investigate how these industry specific factors influence the components of capital structure (long- and short-term debt, total debt, and liquidity), we estimate four models specifying each financing component as a dependent variable in turn. While we especially focus on seasonality and corporate clustering, we also control for other factors that previous studies have found to affect financial structure, including profitability, the growth in sales, the share of fixed assets, firm size, and non-debt tax shields (NDTS).

The remainder of the paper is organized as follows. Section 2 provides a literature review and develops the expectations for the empirical relationships. Section 3 briefly discuss capital structure in the hospitality industry. Section 4 presents the data and defines the variables. Section 5 presents the empirical models, and Section 6 the empirical results. Finally, Section 7 presents main the findings and conclusions.

2. Literature Review

2.1. Capital structure theory

A large body of related research has followed since Modigliani and Miller (M&M) proposed their capital structure propositions (Modigliani & Miller, 1958, 1963). Among the most influential contributions are the trade-off theory (TOT) (Kraus & Litzenberger, 1973) and the pecking order framework (POF) (Myers, 1984).

M&M Proposition I suggests that under perfect capital markets, debt does not add value to the firm. M&M Proposition II further shows that if Proposition I holds, the cost of equity increases linearly with the debt to equity ratio. Further, it demonstrates that the weighted average cost of capital is constant with an increasing debt ratio. Debt capital is usually cheaper than equity, and an increase in debt, ceteris paribus, should decrease the weighted average cost of capital (WACC). However, an increase in the cost of equity as a consequence of higher debt ratio generally offsets this effect, making the WACC independent of the amount of debt in the capital structure. Further, through their tax-adjusted capital structure proposition (Modigliani & Miller, 1963), M&M predicted that the optimal capital structure is 100% debt given that interest payments is tax deductible.

TOT extends the M&M framework by taking into account the tradeoff between the dead-weight costs of bankruptcy and the tax benefits of debt. According to the TOT of capital structure, management evaluates benefits and costs of different corporate debt levels. An optimal leverage is reached when marginal benefit of debt equals its marginal cost. An important component of the expected costs is the direct and indirect costs of financial distress (Andrade & Kaplan, 1998). Kraus and Litzenberger (1973) provide an early analysis of the

trade-off between deadweight loss at bankruptcy and the tax benefits of debt. Graham (2003) provides an excellent review on the effects of tax on capital structure. TOT can be classified as either static or dynamic. According to the static version of TOT, a firm chooses a leverage ratio based on a single period tradeoff between tax benefits and expected bankruptcy costs (Bradley, Jarrell, & Kim, 1984). The dynamic TOT proposes that firms move towards a target leverage but is allowed to gradually adjust over time (Kane et al., 1984; Brennan & Schwartz, 1984).

The pecking order framework (POF) of capital structure (Myers, 1984) predicts that firms finance assets in a hierarchical fashion because of adverse selection. According to this theory, both the costs of financing and the degree of information asymmetry are important capital structure determinants. In essence, POF suggests that when it comes to financing assets, internal capital is preferred, followed by debt capital, while the strategy of issuing new equity is only adopted if the other financing alternatives are not available. The important motivations for POF are adverse selection (Myers & Majluf, 1984) and agency theory (Jensen & Meckling, 1976).

The discussions above show that the theories provide conflicting results regarding optimal debt usage (Barclay & Smith, 2020). Specifically, M&M proposes 100% debt, TOT suggests a debt level where marginal debt benefit equals marginal debt cost, and POF suggests that internal capital should be preferred before debt capital. However, we believe TOT and POF better explain the observed capital structure decisions of firms than the M&M propositions based on the following reasons. First, in all industries, debt ratios are practically on average

well below 100% (Hall, Hutchinson & Michaelas, 2010). Few companies keep the leverage to assets ratio above 50% for longer periods of time (DeAngelo & Roll, 2015). Second, TOT explains observed debt ratios below 100% by taking into account the expected bankruptcy costs. The assumption of perfect capital markets in the M&M propositions implies no bankruptcy cost. However, bankruptcy costs create a dependence between the cash flow distribution and capital structure. Accordingly, the assumption of no dependence between the cash flow distribution and capital structure as indicated by the zero-bankruptcy cost in the M&M propositions is therefore unrealistic.

Another important contribution to capital structure theory is the market timing theory introduced by Baker and Wurgler (2002), where corporations' capital structure "…evolves as the cumulative outcome of past attempts to time the equity market (p. 27)." According to the theory, a firm issues equity when the price to book ratio is high and repurchases equity when its stock is at low market value. Accordingly, firms with high (low) leverage are those that have raised capital when the prices of their stocks were low (high) relative to their book values. Studying IPOs, Alti (2006) finds that market timing does not have a significant long-term effect on capital structure, only in a two-year window after listing of the firm. In our study, since none of the firms in our sample are publicly listed, we resort to testing the POF and TOT of capital structure.

2.2. Components of capital structure

In this study, we investigate several components of capital structure and their determinants. The components chosen are short-term debt (STD), long-term debt (LTD), total debt (TD), and liquidity (LIQ). STD, or current liabilities (e.g., short maturity bank loans, accounts payable, wages, and income taxes payable, and current portion of long-term debt) is the firm's financial obligations expected to mature within a year. LTD is debt that is expected to be paid off in more than one year (e.g., long-term bank loans and long-term bonds). Total debt is the sum of STD and LTD. Finally, our liquidity component is net current assets, meaning current assets (the most liquid assets in the balance sheet: e.g., cash and cash equivalents, inventory, accounts receivable, marketable securities, and other liquid assets) minus current liabilities (explained above).

Since some firms must substitute short-term debt for long-term debt if they lack success in raising longer-term debt (Chittenden et al., 1996). Small firms also need to rely on short-term debt financing as a substitute for long-term financing (MacMillan, 1931; Bolton, 1971; Wilson, 1980; Chittenden et al., 1996), we include both STD and LTD to capture any trade-off between the debt of different maturities. We include TD as a dependent variable to identify as such a trade-off, and we can measure the net impact of changes in STD and LTD on TD. We might, for example, observe the following: if there is a perfect substitution between STD and LTD, TD will remain unchanged. If not, TD might be affected by an increase or decrease in either of the two total debt components. In addition, we include LIQ as a component of capital structure because we want to examine how liquid assets are affected by seasonality and clustering.

The primary purpose of STD is to ensure that the firm has cash available for day-to-day operations. Therefore, especially when the firm's revenues are insufficient to cover the operational needs, STD can be a beneficial source of capital. The main advantage of LTD over STD is that a firm has a longer time to repay the loan and can therefore finance larger investments in long-term projects. LTD is used to fund investments necessary to maintain existing capacity and also to finance expansions and new projects. Liquidity analysis is also important for firms as it is used to determine a firm's ability to pay off current debt without raising additional capital. The dependent variables are defined in section 4.2.

2.3. Determinants of capital structure

Having described the components of capital structure that will be our dependent variables, we now turn to discuss the determinants of the components of firm capital structure – our independent variables. This section discusses how the conventional determinants, including profitability, growth, asset structure, size, and non-debt tax shield, affect firm capital structure following the TOT and POF theories. After that, we summarize the TOT and POF predictions of how these variables affect the determinants on capital structure. The hospitability industry specific determinants of capital structure are discussed in sections 3.1 and 3.2. The independent variables are defined in Table 3.

2.3.1. Profitability

Since profitable firms are more likely to take advantage of the tax shield provided by debt (Toy et al., 1974; Chittenden et al., 1996; Tang & Yang, 2007; Pacheco & Tavares, 2017; Li & Singal, 2019) and have lower expected bankruptcy costs as well, TOT therefore predicts that profitable firms use more debt in their capital structure. However, according to POF, a firm finance its capital with accumulated equity first, then debt, and as a last resort, newly issued equity. This framework predicts a negative relationship between profitability and leverage, such that a more profitable firm may need less external capital because it already generates capital internally. The two capital structure theories therefore have contradictory predictions about the relationship between profitability and debt.

Several empirical studies (e.g., Botta, 2019; Chittenden et al., 1996; Kim, 1997; Karadeniz et al. 2009) identifies a negative relationship between profitability and short-term debt. We also hypothesize a negative relationship between profitability and short-term debt, and the same relationship for profitability and long-term debt.

2.3.2. Growth

Proxies for firm growth are also previously used in the existing literature on capital structure (López-Gracia & Sánchez-Andújar, 2007; Devesa & Esteban, 2011; Mun & Jang, 2017). Growth firms have greater investment opportunities, and as investment opportunities can increase agency problems between managers and creditors, TOT thus predicts a negative relationship between growth and debt (Myers 1977). According to POF, debt is expected to be positively associated with growth because growing firms may not have internal capital

available to finance growth as they might already have been exhausted in financing previous growth.

TOT and POF therefore provide contradicting predictions. There is a mix of empirical findings when it comes to the direction of this relationship. Most studies find no relationship between growth and debt (e.g., Pacheco & Tavares, 2017; Chittenden et al., 1996), while Kim (1997) finds a negative relationship.

2.3.3. Asset structure

Asset structure is another important capital structure determinant (Friend & Lang, 1988; Tang & Yang, 2007; Kizildag & Ozdemir, 2017; Li & Singal, 2019). More tangible assets may reduce the risk of bankruptcy and therefore increase the expected bankruptcy costs. TOT therefore predicts a positive relationship between asset structure and debt. According to POF, debt is preferred before new equity issues. This means that if internal capital is unavailable, new debt is preferred. Therefore, according to both TOT and POF, asset structure is expected to be positively related to the level of debt. If firms prefer to use long-term debt to finance long-term projects, we expect a positive relationship between asset structure and long-term debt. In addition, we expect a substitution effect between long-term debt and short-term debt. This means that the more collateral a firm can provide, the higher is the ratio of long-term debt to total capital.

Consistent with the theoretical predictions, previous research has identified a positive relationship between asset structure and long-term debt (e.g., Botta, 2019; Pacheco & Tavares,

2017; Tang & Jang, 2007). As we define asset structure using the share of fixed assets in total assets then, ceteris paribus, the higher the share of fixed assets is, the lower is the share of short-term liquidity. Therefore, we expect a negative relationship between asset structure and liquidity.

2.3.4. Firm size

There is a problem of asymmetric information between borrowers (e.g., firms) and lenders (e.g., banks) in financial markets. Thus, firm size has been found to affect the availability of financing options (Titman & Wessels, 1988; Sheel, 1994; Tang & Yang, 2007; Mun & Jang, 2017). Creditors are more likely to know large firms and at the same time large firms are better able to provide detailed information to potential creditors. This leads to a finance gap between small and large firms such that small firms to an increasing extent need to rely on short-term debt financing as a substitute for long-term debt financing (MacMillan, 1931). This is consistent with the TOT prediction of positive relationship between size and debt as larger firms have lower bankruptcy probability (e.g., Ohlson, 1980), and therefore lower expected bankruptcy costs. If firm size affects long-term debt availability, we expect that large firms use long-term debt as a substitute for short-term debt. Through growth, large firms may also accumulate more liquid assets, and we therefore expect to see a positive relationship between firm size and liquidity.

2.3.5. Non debt tax shield

Non debt tax shield (NDTS) is a substitute for the interest rate tax shield (DeAngelo & Masulis, 1980; Bradley, Jarrell, & Kim, 1984; Titman & Wessels, 1988; Barton, Hill, & Sundaram, 1989), and TOT therefore predicts a negative relationship between NDTS and leverage (or positive relationship between leverage and the tax benefits of debt). For this variable, there are mixed empirical findings in the literature. Karadeniz et al. (2009) and Botta (2019) identify a positive relationship, Kim (1997) and Devesa and Esteban (2011) find no relationship, and Sheel (1994) a negative relationship.

To give an overall picture of the debt predictions of TOT and POF, we have summarized the predictions in Table 1 below.

Table 1. Summary of the debt predictions of TOT and POF

	TOT	POF
Profitability	+	−
Growth	−	+
Asset structure	+	+
Firm size	+	0
NDTS	−	0

Notes: "+" indicates a positive relationship, "–" a negative relationship, and "0" no relationship.

3. Capital Structure in the Hospitality Industry

Several studies have investigated the determinants of capital structure in hospitality firms. Nevertheless, to best of our knowledge, no study has investigated the effects of the industry characteristics of seasonal concentration and firm clustering on hospitality firm's capital structure.

Kwansa and Cho (1995) find that there are significant indirect and direct bankruptcy costs in the restaurant industry, and therefore question the applicability of the M&M propositions in the industry. Sheel (1994) investigates the determinants of capital structure of hotel firms and compares hotel firms' capital structure with that of manufacturing firms. His study suggests differences in capital structure between the two industries. Likewise, Tang and Jang (2007) compare the capital structure covariates of the US lodging firms and software firms and again identify differences in capital structure between these two industries. Although Sheel (1994) and Tang and Jang (2007) have not directly tested the importance of industry characteristics in firms' capital structure determinants, the two studies recommend the importance of industry-specific analysis of capital structure determinants.

For a detailed discussion of the determinants of capital structure in the hospitality industry, we further review the literature for the restaurant, food, and beverage sector and the lodging sector separately. In the restaurant, food, and beverage sector, Kim (1997) investigates the determinants of long- and short-term debt and the total debt ratio in the US restaurant industry using the financial data of 119 restaurants. The results indicate that firm size negatively influences long-term debt, sales profitability negatively links to total debt, and sales growth negatively influences all three measures of debt. Additionally, Dalbor and Upneja (2002) identify factors determining the use of long-term debt among the publicly listed restaurant firms in the US and find that firm size and financial distress positively influence the share of long-term debt in the capital structure and growth opportunities are negatively associated with long-term debt. The asset-light and fee-oriented strategy (ALFO), which

allows for firm growth with a minimum investment in assets, is found to increase the long-term debt of restaurant firms (Li & Singal, 2019)[2]. Mun and Jang (2017) find that the US restaurant firms use debt financing to refinance debt maturing in two and three years. Analyzing long term debt ratios from a behavioral perspective, Seo, Kim and Sharma (2017) find that overconfident CEOs in the US finance the restaurant firm using more long-term debt when facing greater growth opportunities and low cash.

In the lodging sector, Karadeniz et al. (2009) investigate the determinants of financial structure in the Turkish lodging sector and find that effective tax rates, asset tangibility, and the return on assets negatively relate to the debt ratio, whereas free cash flow, NDTSs, growth opportunities, the net commercial credit position, and firm size do not appear to have any influence. Devesa and Esteban (2011) investigate capital structure in the Spanish hotel sector and conclude that factors related to solvency, liquidity, and asset structure are important determinants of indebtedness. Pacheco and Tavares (2017) examine the determinants of total and long- and short-term debt of small and medium-sized (SME) hotel firms in Portugal. They suggest profitability, asset tangibility, firm size, total debt, and solvency are important factors that affect firm financial structure. Botta (2019) finds that SME in the hotel sector prefer to finance according to the predictions of the POF theory and are less concerned with optimizing capital structure.

[2] We do not include ALFO in our study because we cannot find the information about financial strategy in the sample firms' annual reports. The reason for this might be that all the sample firms are private, meaning the requirements for their financial reporting are less comprehensive than the publicly listed companies.

Lastly, Kizildag and Ozdemir (2017) investigate the impact of both firm-specific and macro factors on firm debt in the US tourism and hospitality industry during the period 1990–2015. They find that firms in the tourism and hospitality industry increased their dependence on long-term debt financing following the 2007/08 financial crisis.

This literature review indicates that there are no systematic difference between the restaurant, food, and beverage sector and the lodging sector when it comes to the sign or significance of the explanatory factors of capital structure. This might be due to that the previous studies investigate different firms over different periods, using different sets of independent and dependent variables. Nevertheless, there is one exception. Li and Singal (2019) include a separate econometric estimation for hotels and restaurants using data in an identical period. They find the effect of NDTS on LTD is positive in restaurant firms but negatively in hotel firms. In addition, the ratio of fixed assets to total assets, is negatively related to LTD for restaurant firms while not significantly affecting hotel firms. Lastly, Li and Singal (2019) find that restaurant firms with a high market-to-book ratio have more long-term debt, but the LTD of hotel firms is unaffected by the market-to-book ratio. In this paper, we will also investigate whether the determinants of capital structure are different between hotels and restaurants through the robustness tests of our econometric models.

The hospitality industry is unique in many aspects with perhaps the most important being the highly seasonal demand and clustering of firms in geographical locations. However, the most influential theories of capital structure (M&M, TOT, and POF) (Modigliani & Miller, 1958, 1963; Jensen & Meckling, 1976; DeAngelo & Masulis, 1980; Myers, 1977, 1984;

Myers & Majluf, 1984) assume that firm-level financing structure is independent of industry characteristics. Consequently, if industry-specific factors including seasonal concentration and firm clustering are found to significantly influence capital structure in the hospitality industry, it is important to expand the existing capital structure theories by including these factors. Next, we discuss how tourism seasonality and clustering affect the capital structure in the hospitality industry.

3.1. Seasonality

Seasonal demand has long been documented as one of the most significant industry characteristics for the hospitality industry (e.g., Hartmann, 1986; Lundtorp et al., 1999). Seasonality in tourism demand is mainly due to climatic and institutional factors (Lundtorp et al., 1999; Butler, 2001; Cuccia & Rizzo, 2011). Changes in seasonal weather conditions increase the further north or south from the equator (Hartmann, 1986; Butler, 1994), and therefore tourism destinations in more northerly or southerly latitudes may experience increasing seasonal volatile demand (Lundtorp et al., 1999). Institutional factors can also contribute to seasonality because of the typically fixed timing of holidays (e.g., summer and Christmas holidays). Other factors that contribute to seasonality include tourist income and travel costs (Nadal et al., 2004; Xie, 2020) and demographic traits (Ashrafi & Myrland, 2017).

Many tourism destinations are geared towards specific months of the year. Efforts aiming at mitigating tourism seasonality include splitting the aggregate measure of seasonality into tourism groups, i.e., foreign and/or domestic tourists, and analyzing the impact of these groups

on tourism industry outcomes (Garín-Muñoz, 2009; Martín et al., 2014; Zhang et al., 2020). This approach can reveal important information regarding targeted marketing campaigns and help contribute to reducing seasonality. Despite such efforts in many destinations worldwide, large variations in demand from tourists throughout the year persist over time and continue to create financial challenges for the global tourism industry.

The literature documents the effects of seasonality on tourism industry economic performance. Examples include the inefficient use of facilities and resources during the year and difficulty in recruiting quality employees owing to seasonal employment (e.g., Manning & Powers, 1984; Baum, 1999; Koenig-Lewis & Bischoff, 2005; Pegg et al., 2012). Baum (1999) and Baum and Lundtorp (2001) discuss how seasonal demand in tourism creates challenges when it comes to attracting investment into the industry. A recent analysis by Zhang et al. (2020) suggests that seasonal demand can contribute to Norwegian hotel firm profitability due to the high revenue generated in peak seasons. That said, and as we have discussed, there is currently no study investigating how seasonality affects firm capital structure. Given that seasonality influences tourism firms' economic performance and investment, we expect it also influences tourism firms' capital structure.

It is difficult to form expectations about the relationship between the different capital structure components due to the lack of theoretical support and empirical research. The empirical results may depend on the risk tolerance of equity holders and creditors. However, we expect that seasonality negatively affects long term debt since first, we assume creditors have low tolerance to the demand risk from volatile seasonal demand; second, seasonality

may increase probability of bankruptcy due to its negative effect on firms' economic performance and investment (Lundtorp, 2001; Zhang et al., 2020) and TOT predicts that less profitable firms use less debt in their capital structure. If LTD is not readily available for firms exposed to highly seasonal demand, STD may be used as a substitute and be positively related to seasonality. The relationship between seasonality and TD depends on the degree of substitution. If STD fully substitutes LTD, then we expect no relationship between TD and seasonality. Since it is more likely that STD cannot fully substitute LTD, we expect that seasonality is negatively associated with TD. Lastly, liquidity may dry up in the low season, and therefore we expect a negative effect of seasonality on liquidity.

3.2. Clustering

Several studies on the hotel industry have documented that hotel firms benefit in terms of profitability by being located together with other tourism firms (Chung & Kalnins, 2001; Canina et al., 2015; Peiró-Signes et al., 2015). The literature ((Devereux et al., 2007; Chittenden et al., 1996; Ellison & Glaeser, 1999; Peiró-Signes et al., 2015; Rodríguez-Victoria et al., 2017) suggest higher returns and growth benefits be the result for firms located within a cluster, owing to the advantages of industry clustering, such as information and knowledge spillover between firms, public goods access, and synergies arising from specialization within the cluster (Porter, 1990).

However, being part of a cluster may also increase rivalry (Marco-Lajara et al., 2014) and thus competition between tourism firms in the demand for both customers and capital. Further,

the impact of clustering is heterogeneous and asymmetric among firms, and depends on an individual firm's strategy, past competitiveness, and the diversity of strategies within the clustered area (Canina et al., 2015). Marco-Lajara et al. (2014) find that Spanish hotels located in clusters have lower profitability.

As discussed, the effects of clustering on hospitality firms are ambiguous. It can positively affect profitability for firms and profitability is found to be negatively linked to total debt (Chittenden et al., 1996). Clustering can, therefore, potentially indirectly reduce total debt through the increased profitability effect. On the other hand, clustering can increase competition between firms for both customers and capital and, therefore, reduce the probability of obtaining attractive sources of capital for firms. Assuming that LTD is seen as favorable financing for long-term projects within the hospitality industry, firms might have to substitute STD for LTD, and therefore, clustering can positively affect the amount of STD in capital structure. If the effect of clustering is positive, more internal capital may be available due to the positive effects of being located in a cluster. Since, according to POF, internal capital is preferred, we expect a negative relationship between clustering and debt. On the other hand, if the effect of clustering on profitability is negative, POF predicts that firms may be unable to use their preferred source of financing (internal equity) and may find it more difficult to get debt financing, and therefore have to resort to issuing new equity. In other words, we can expect a negative effect on debt both if the effect of the cluster is positive and negative. Since the cluster can affect expected bankruptcy costs, the TOT predicts a negative

(positive) relationship between debt and clustering if the effect of the cluster is negative (positive).

4. Data and Variables

4.1. Data

The financial data used in the analysis are from the Brønnøysund Register Center, a Norwegian data center containing balance sheets, income statements, and firm-specific information on all Norwegian companies. Our data set comprises 25,538 firm-year observations for 5,474 lodging sector and restaurant, food, and beverage sector firms in the period 2008–2018[3].

Table 2. Sample overview

Sector	Observations	Firms
Hotels and similar accommodation	4,070	667
Holiday and other short-stay accommodations	949	169
Camping grounds, recreational vehicle parks, and trailer parks	1512	236
Hostels	36	13
Restaurants and mobile food service activities	15,518	3,567
Event catering and other food service activities	1970	478
Beverage serving activities	1483	344
Total	25,538	5,474

The lodging firms include hotels and similar accommodation, holiday and other short-stay accommodation, camping grounds, recreational vehicle parks and trailer parks, and other

[3] Due to a limitation on the period for data that can be downloaded from the database we could not go further back in time than 2008.

kinds of accommodation. As there are no listed hospitality firms in Norway, all the firms in our sample are private firms. We supplement our data set with data on the number of overnight stays at hotels and similar establishments in Norway during the same period from Statistics Norway (2020a). Table 2 details the number of observations for each sector.

4.2. Dependent Variables

As we discussed above, the components of capital structure include long-term debt (LTD), short-term debt (STD), total debt (TD), and liquidity (LIQ), which are expressed as follows:

$$LTD = (LTL + OLTL)/TA$$

$$STD = CL/TA$$

$$TD = (CL + LTL + OLTL)/TA$$

$$LIQ = (CA - CL)/TA$$

where long-term debt (LTD) is the sum of long-term liabilities (LTL) and other long-term liabilities (OLTL) divided by total assets (TA). STD is short-term debt, which is current liabilities (CL) divided by TA. TD is total debt, measured by the sum of CL, LTL, and OLTL divided by TA. Dividing debt by total assets is also the usual way of presenting debt ratios. Similar studies of capital structure in the hospitality sector construct these variables in the same manner (e.g., Botta, 2019; Chittenden et al. (1996); Dalbor & Upneja, 2002; Devesa & Esteban, 2011; Karadeniz et al., 2009; Kim and Sharma, 2017; Kizildag and Ozdemir, 2017; Li & Singal, 2019; Mun & Jang, 2017; Seo, Sheel, 1994; Tang & Jang; 2007). Finally, LIQ is liquidity, which is current assets (CA) minus CL, divided by TA. As indicated, all the dependent variables are in percentages of TA. The liquidity variable (LIQ) is constructed as

net liquid assets as a share of total assets (Chittenden et al. 1996). The motivation behind is to make the liquidity variable a capital structure measure, consistent with the measurement of the other dependent variables. Another reason why we divide capital structure variables and independent variables by total assets is that we wanted to deflate the variables by a scale proxy. In this way we control for the effect of scale.

As discussed above, profitability, growth, asset structure, firm size, and NDTS are usually used in the literature as explanatory variables of capital structure. Following the literature, profitability is represented by return on sales (ROS), which is profit before interest payments and taxes, divided by total assets. Firm growth (GROWTH) is annual growth in sales. Asset structure is fixed assets divided by total assets. Firm size is proxied by TOTAL ASSETS from the balance sheet. NDTS is the non-debt tax shield and is depreciation divided by total assets. CLUSTERING is the number of firms in a region (See Appendix 1).

4.3. Measuring tourism seasonality.

We measure seasonal demand using the Gini index as it is the most commonly employed measure in the tourism literature (Fernández-Morales et al., 2016; Xie, 2020; Zhang et al., 2020; Zhang & Xie, 2021).

The Gini index for a particular region (*r*) in a given year (t) is computed as follows:

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

where *n* is the number of months with no-zero overnight stays. *n* is 12 in our study since throughout our sample, there are a considerable amount of overnight stays in all months in every region every year. $S_{t,1}$, $S_{t,2}\ldots S_{t,12}$ are the monthly shares of overnight stays in month *k* in year *t* in each region. $\sum_{k=1}^{n} w_k S_{t,k}$ is the sum of the weighted monthly shares. The weights w_k= 1, 2, 3…12, with the largest weight (12) goes to the smallest share, the second largest (11) to the month with the second-smallest share, and so on.

To investigate whether the seasonal demand of foreign and domestic tourists influences firm capital structure differently, we construct two separate Gini indices for hotel overnight stays of domestic tourists and foreign tourists, along with an aggregate index for total hotel overnight stays. Specifically, for the Gini index of domestic tourist hotel overnight stays, $S_{t,1}$, $S_{t,2}\ldots S_{t,12}$ in Equation 1 are the monthly shares of overnight stays given by the domestic tourists in month *k* in year *t* in each region. Domestic tourist is replaced by foreign tourist in the Gini index for foreign tourist hotel overnight stays, and by total overnight stays (including both domestic and foreign tourists) in the Gini index for total hotel overnight stays. The left specifications in Equation 1 are identical across each index.

The estimated Gini indices are presented in Figure 1. The Gini index is much higher in the market segment of inbound tourists, suggesting more volatile seasonal demand by foreign tourists than domestic tourists.

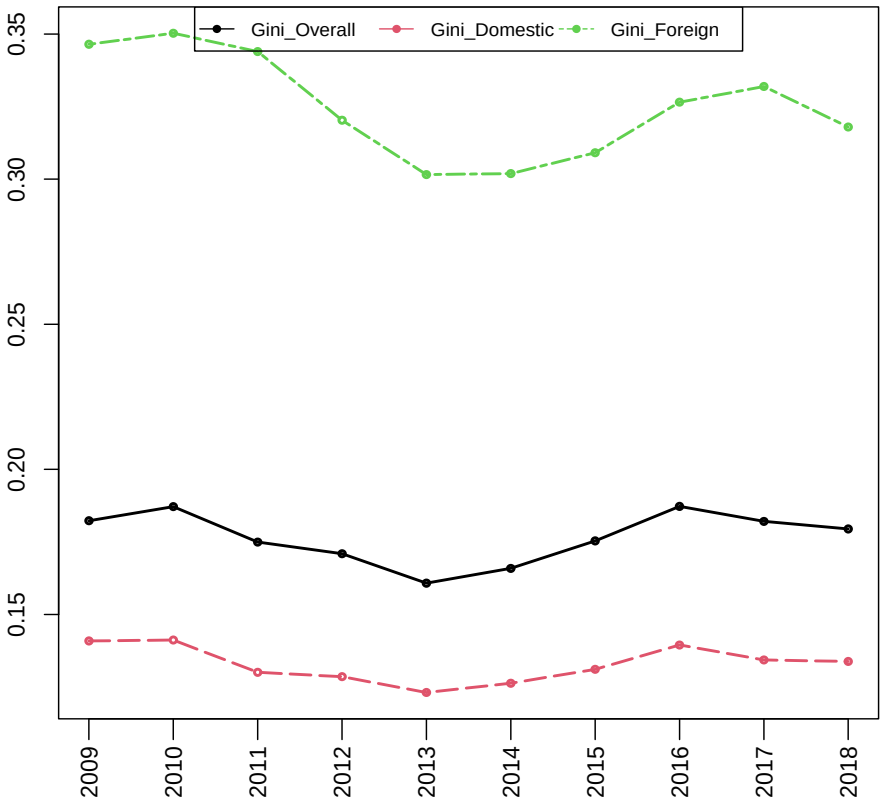

Figure 1. Overall Gini index and disaggregated Gini indices for domestic and foreign segments.

Zhang et al. (2020) discuss that the leisure segment is more seasonal compared to the business segment as holiday travel is more subject to institutional patterns such as school or calendar holidays. Since the domestic market has a much higher portion of business travel than inbound travel, it is expected that seasonal demand concentration is higher in the international market segment. Moreover, most of the tourism attractions in Norway are nature based, which makes holiday travel concentrate in summer between June and August at most of tourism

destinations, and also in winter between January and February in Northern Norway for the Northern lights.

4.4. Descriptive statistics

Table 3 presents the definitions of each variable and its descriptive statistics. As shown, the average total debt in the hospitality industry is about 70% of total assets, considerably higher than the average debt ratio of nonfinancial Norwegian companies, which was 57% during the same period. This is not consistent with the finding that what few companies have debt ratios over 50% over longer periods of time (DeAngelo & Roll, 2015) and indicates that the hospitality industry is highly leveraged, consistent with the findings of Kim's (1997) study of capital structure in the tourism industry.

Table 3. Summary statistics

Variable	Definition	Mean	SD	Min.	Max.
LTD	The sum of long-term liabilities and other long-term liabilities, divided by total assets	0.162	0.236	0.000	0.980
STD	Current liabilities divided by total assets	0.533	0.262	0.007	1.242
TD	The sum of long-term debt and short-term debt divided by total assets	0.696	0.210	0.055	1.661
LIQ	Current assets minus current liabilities divided by total assets	0.098	0.273	-0.964	0.868
ROS	Return on sales: Profit before financial costs and taxes, divided by sales.	0.058	0.159	-2.471	1.785
GROWTH	Annual growth in sales	0.232	0.942	-0.897	12.30
ASSET STRUCTURE	Fixed assets divided by total assets.	0.369	0.283	0.000	0.984
TOTAL ASSETS	Logarithm of total assets in million NOK	14.62	1.199	10.46	18.09
NDTS	Depreciation divided by total assets	0.060	0.055	0.000	0.780
FIRM NUMBER	Logarithm of the number of hospitality firms in region	4.450	1.294	0.000	6.774
GINI-OVERALL	Aggregate Gini index measuring seasonality	0.177	0.062	0.087	0.397
GINI-FOREIGN	Gini index for foreign tourist demand	0.133	0.053	0.054	0.284
GINI-DOMESTIC	Gini index for domestic tourist demand	0.323	0.114	0.105	0.648

Table 4 provides the pairwise correlations between the variables in the econometric estimation. None of the independent variables that appear in the same model together have a correlation coefficient of absolute value greater than 0.34, indicating no significant multicollinearity issues. Although there are high correlations between the overall Gini index and Gini foreign and Gini domestic, as they do not appear with the overall Gini measure in any model, we again expect no multicollinearity issues.

When it comes to the pairwise correlation between the dependent variables and the industry-specific independent variables, we can see from Table 4 that clustering exhibits its highest correlation with short-term debt. The correlation is of positive sign, indicating that short-term debt is higher in the denser clusters. For the Gini indices, Gini overall has its highest correlation with long-term debt. However, Gini foreign has a higher correlation with long-term debt financing than Gini domestic, indicating that it may be important to disaggregate the measure of seasonal demand when developing financial management policy.

Table 4. Correlation coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) STD	-0.6483***											
(2) TD	0.3149***	0.5184***										
(3) LIQ	-0.0492***	-0.4432***	-0.6077***									
(4) ROS	0.0794***	-0.1444***	-0.0908***	0.0981***								
(5) GROWTH	0.0004	0.0560***	0.0703***	-0.0554***	0.0207***							
(6) ASSET STRUCTURE	0.6487***	-0.4987***	0.1069***	-0.5560***	0.0390***	0.0016						
(7) TOTAL ASSETS	0.3369***	-0.2304***	0.0911***	-0.1068***	0.1350***	-0.0920***	0.3170***					
(8) NDTS	0.0946***	0.0092	0.1177***	-0.3312***	-0.1239***	-0.0186**	0.3117***	-0.0578***				
(9) CLUSTERING	-0.1987***	0.2206***	0.0519***	-0.0610***	-0.0464***	0.0082	-0.1456***	0.0379***	0.0439***			
(10) GINI-OVERALL	0.1612***	-0.1530***	-0.0097	0.0231***	-0.0116	-0.0227***	0.1196***	-0.0154*	-0.0253***	-0.3070***		
(11) GINI-FOREIGN	0.1096***	-0.1036***	-0.0062	0.0138*	-1.15E-02	-0.0225***	0.0828***	-0.0528***	-0.0094	-0.3369***	0.7697***	
(12) GINI-DOMESTIC	0.1835***	-0.1691***	-0.0047	0.0268***	-0.0006	-0.0171**	0.1309***	0.0175**	-0.0176**	-0.2095***	0.7200***	0.2351***

Notes: See Table 3 for variable definitions. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively.

5. Empirical models

We sequentially present the econometric models for the components of capital structure comprising LTD, STD, TD, and LIQ. Among the determinants of capital structure, seasonality is represented by the Gini index as discussed above and clustering refers to the number of hospitality firms in a region where a firm is located.[4] The empirical models are expressed as follows:

$$LTD_{it} = \alpha_{10} + \alpha_{11}ROS_{it} + \alpha_{12}GROWTH_{it} + \alpha_{13}ASSET\_STRUCTURE_{it} + \alpha_{14}TOTAL\_ASSETS_{it} + \alpha_{15}NDTS_{it} + \alpha_{16}CLUSTERING_{t,r} + \alpha_{17}GINI\_OVERALL_{t,r} + Fixed\ Effects\ + u_{it} \quad (2)$$

$$STD_{it} = \alpha_{20} + \alpha_{21}ROS_{it} + \alpha_{22}GROWTH_{it} + \alpha_{23}ASSET\_STRUCTURE_{it} + \alpha_{24}TOTAL\_ASSETS_{it} + \alpha_{25}NDTS_{it} + \alpha_{26}CLUSTERING_{t,r} + \alpha_{27}GINI\_OVERALL_{t,r} + + Fixed\ Effects + u_{it} \quad (3)$$

$$TD_{it} = \alpha_{30} + \alpha_{31}ROS_{it} + \alpha_{32}GROWTH_{it} + \alpha_{33}ASSET\_STRUCTURE_{it} + \alpha_{34}TOTAL\_ASSETS_{it} + \alpha_{35}NDTS_{it} + \alpha_{36}CLUSTERING_{t,r} + \alpha_{37}GINI\_OVERALL_{t,r} + Fixed\ Effects + u_{it} \quad (4)$$

[4] Appendix 1 presents the number of firms by region.

$$LIQ_{it} = \alpha_{40} + \alpha_{41}ROS_{it} + \alpha_{42}GROWTH_{it} + \alpha_{43}ASSET\_STRUCTURE_{it} + \alpha_{44}TOTAL\_ASSETS_{it} + \alpha_{45}NDTS_{it} + \alpha_{46}CLUSTERING_{t,r} + \alpha_{47}GINI\_OVERALL_{t,r} + Fixed\ Effects + u_{it} \quad (5)$$

where subscripts *t* and *i* denotes time and individual firm, respectively. *Fixed Effects* represent both firm, year, and regional fixed effects. In each model, the explanatory variables are identical. See Table 3 for variable definition.

As discussed, to explore whether the seasonal demand of different tourist groups influence firm capital structure differently, we split the Gini index in two, one for domestic tourists and the other for foreign tourists. The empirical models therefore become:

$$LTD_{it} = \beta_{10} + \beta_{11}ROS_{it} + \beta_{12}GROWTH_{it} + \beta_{13}ASSET\_STRUCTURE_{it} + \beta_{14}TOTAL\_ASSETS_{it} + \beta_{15}NDTS_{it} + \beta_{16}CLUSTERING_{t,r} + \beta_{17}GINI\_DOMESTIC_{t,r} + \beta_{18}GINI\_FOREIGN_{t,r} + Fixed\ Effects + u_{it} \quad (6)$$

$$STD_{it} = \beta_{20} + \beta_{21}ROS_{it} + \beta_{22}GROWTH_{it} + \beta_{23}ASSET\_STRUCTURE_{it} + \beta_{24}TOTAL\_ASSETS_{it} + \beta_{25}NDTS_{it} + \beta_{26}CLUSTERING_{t,r} + \beta_{27}GINI\_DOMESTIC_{t,r} + \beta_{28}GINI\_FOREIGN_{t,r} + +Fixed\ Effects + u_{it} \quad (7)$$

$$TD_{it} = \beta_{30} + \beta_{31}ROS_{it} + \beta_{32}GROWTH_{it} + \beta_{33}ASSET\_STRUCTURE_{it} + \beta_{34}TOTAL\_ASSETS_{it} + \beta_{35}NDTS_{it} + \beta_{36}CLUSTERING_{t,r} + \beta_{37}GINI\_DOMESTIC_{t,r} + \beta_{38}GINI\_FOREIGN_{t,r} + Fixed\ Effects + u_{it} \quad (8)$$

$$LIQ_{it} = \beta_{40} + \beta_{41}ROS_{it} + \beta_{42}GROWTH_{it} + \beta_{43}ASSET\_STRUCTURE_{it} + \beta_{44}TOTAL\_ASSETS_{it} + \beta_{45}NDTS_{it} + +\beta_{46}CLUSTERING_{t,r} + \beta_{47}GINI\_DOMESTIC_{t,r} + \beta_{48}GINI\_FOREIGN_{t,r} + Fixed\ Effects + u_{it} \quad (9)$$

Before estimating the models, we winsorized 1% in each tail of the distribution of our dependent and independent variables.

6. Empirical results

6.1. Models with overall Gini index

We start by discussing the estimation results of the four models with the overall Gini index only (Equations 2–5), as presented in Table 5.

Table 5. Estimation results of the fixed effects models with overall Gini index.

Variable	LTD		STD		TD		LIQ	
ROS	-0.0455	***	-0.0696	***	-0.1152	***	0.0696	***
	[0.009]		[0.01]		[0.0108]		[0.0100]	
GROWTH	0.0010		0.0075	***	0.0085	***	-0.0075	***
	[0.0011]		[0.0014]		[0.0011]		[0.0014]	
ASSET STRUCTURE	0.2989	***	-0.2251	***	0.0737	***	-0.7749	***
	[0.0097]		[0.0100]		[0.0097]		[0.0100]	
TOTAL ASSETS	0.0880	***	-0.0676	***	0.0205	***	0.0676	***
	[0.0037]		[0.0045]		[0.0041]		[0.0045]	
NDTS	-0.0387		0.1269	***	0.0882	**	-0.1269	***
	[0.0295]		[0.0358]		[0.0345]		[0.0358]	
CLUSTERING	-0.0073		0.0203	**	0.0130		-0.0203	**
	[0.0088]		[0.0101]		[0.0100]		[0.0101]	
GINI-OVERALL	0.1296	**	0.1012		0.2308	***	-0.1012	
	[0.0598]		[0.066]		[0.0661]		[0.0660]	
R_squared	0.2262		0.1019		0.0302		0.4110	
Obs.	25538		25538		25538		25538	

Notes: ***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively. Clustered robust standard errors (in brackets) are clustered at firm level. See Table 3 for variable definitions.

6.1.1. LTD model

The LTD estimation in Table 5 shows that the overall Gini index positively influences the share of long-term debt in capital structure. This indicates that in the presence of seasonality, creditors are more willing to finance assets than equity investors in the hospitality industry. As the theories (Modigliani & Miller, 1958, 1963; Jensen & Meckling, 1976; Myers, 1984) assume that firm-level financing structure is independent of industry characteristics, this study shows how the existing theories of capital structure does not well capture an important industry-specific factor that significantly influences financial structure. Seasonality is one of the most important factors in the hospitality industry in general. Thus, not considering this factor can lead to erroneous financial policy decisions.

The estimated coefficient of *CLUSTERING* suggests that whether a firm is within a dense cluster or not does not influence the share of long-term debt in its financial structure. As shown, there is a positive association between asset structure and the share of long-term debt, consistent with the findings in the literature (Chittenden et al., 1996; Tang & Jang, 2007). Given that this is a proxy for collateral, this also suggests that a bank would be more willing to provide a long-term loan if the collateral of a firm is high relative to its total assets. In addition, the estimation results suggest that large firms, as measured by total assets, have a larger share of long-term debt compared to small firms given that they may have more established reputations and perhaps better communication with potential lenders. This is consistent with the findings in Chittenden et al. (1996) and Dalbor and Upneja (2002), and

with the TOT as larger firms have a lower bankruptcy probability and therefore lower expected bankruptcy costs. There is a negative but not significant relationship between NDTS and long-term debt.

Further, we can see that growth is unrelated to the share of long-term debt, which is also consistent with Chittenden et al. (1996). The explanation is that growth is not an asset available for pledging as collateral in a loan application, coupled with the fact that growth is risky. Lastly, the return on sales negatively influences long-term debt. This result is consistent with POF but inconsistent with TOT. POF states that firms should first finance new projects with internal capital. We expect that profitable companies have better opportunities to accumulate more internal capital to finance their assets. The TOT predicts a negative relationship between profitability and debt since profitable firms are more likely to being able to take advantage of the debt tax shield and these firms have lower expected bankruptcy costs.

6.1.2. STD model

The overall Gini index cannot explain changes in short-term debt, while clustering can. The coefficient estimate for clustering is significant and positive, indicating that firms within a region with a large number of competitors rely more on short-term debt financing. In the hospitality industry, many of the investments are long term in nature (e.g., property, plant & equipment investments). We expect that firms would prefer to finance these long-term investments using long-term capital. Our findings that clustering increases the need for short term financing indicates that, in a dense cluster, there is not only competition for tourists, but also for capital. Therefore, this result indicates that the net effect of clustering is negative

when it comes to financing. Marco-Lajara et al. (2014) document the negative effect of clusters in their research on Spanish clusters, however, their focus is not on capital structure.

Given that clustering has a positive net effect on the creditor's decision to lend money, the TOT makes a prediction that better matches our finding. However, it is uncertain whether the cluster positively influences the creditor's decision. We leave this to future research. The coefficient estimates for total assets and asset structure are both negative in the model for short-term debt, again consistent with the results in Chittenden et al. (1996). This suggests that for large firms and firms with larger shares of collateral, there is a substitution effect between long-term and short-term debt in their capital structure. It further suggests it is easier for these firms to use larger long-term loans to replace smaller but more frequent short-term debts. The POF and TOT do not explicitly account for possible substitution effects between LTD and STD. The significant and positive coefficient on NDTS is also most likely a result of the substitution effect between LTD and STD.

Given that the model for long-term debt reveals that growth firms do not hold more long-term debt than other firms, and that the model for short-term debt indicates a significant and positive relationship between growth and short-term debt, this suggests that growth firms must rely more on debt that matures within a year to finance their assets. The estimated coefficient for the return on sales (ROS) suggests that profitable firms use less short-term debt financing, which is in accordance with the findings of Chittenden et al. (1996). The possibility then exists that profitable firms use more equity financing. Our results are in line with the POF which predict a positive relationship between growth and debt, however not in line with the TOT which predicts a negative relationship (Table 1).

6.1.3. TD model

The model for total debt to some extent reflects the results of the models for long- and short-term debt. The Gini overall index positively affects total debt through its effect on long-term debt. Firms in a region with a large number of competitors do not have a larger amount of total debt through the effect of clustering on short-term debt, which indicate some substitution between LTD and STD. Large firms (consistent with Karadeniz et al., 2009) and firms with more collateral also have a higher total debt level, indicating that the net effect of the substitution between long- and short-term debt for these companies results in larger total debt. The positive and significant coefficient on NDTS is a result of the positive relationship between NDTS and STD. The coefficient on growth is positive and significant (also consistent with Karadeniz et al., 2009), suggesting that growth companies increase their total debt by increasing short-term debt. Given that both the short-term and long-term debt models reveal a negative relationship between profitability and debt, profitability negatively relates to total debt.

6.1.4. LIQ model

Our model indicates that seasonality, as represented by the Gini overall index, does not influence hospitality firm liquidity. However, firm clustering negatively influences liquidity. As shown in the model for short-term debt, the degree of clustering mainly affects short-term debt. This might be one of the reasons to explain the negative effect of clustering on firm liquidity.

The estimated results suggest that firms with more total assets also have greater liquidity. The explanation here may be that firms that have grown have had more time to accumulate liquid assets. Further, firms with a higher share of fixed assets have a lower share of liquid assets in their capital structure: a result also found by Chittenden et al. (1996) in their cross-sectional study. These firms having a higher share of property, plants, and equipment may have less room for liquid assets as a share of total assets. The coefficient on NDTS is significant and negative, most likely as a result of the positive relationship between NDTS and STD. Lastly, the result suggests that profitable firms also have more liquidity, indicating that these firms invest at least part of their profits in short-term financial assets.

6.2. Models with disaggregated Gini indices

To investigate further the relationship between the seasonality of different tourist groups and capital structure, we estimated the models (Equations 6–9) with disaggregated Gini indices: one for domestic tourists and the other for foreign tourists. Table 6 provides the estimation results. The coefficient estimates do not change for any of the control variables, regarding either the signs, magnitudes, or their levels of significance. This reflects the robustness of our estimations. Although the estimated results for clustering slightly differ, the interpretations of their relationship with the components in capital structure remain the same.

Table 6. Estimation results of the fixed effects models with disaggregated Gini index.

Variable	LTD		STD		TD		LIQ	
ROS	-0.0456	***	-0.0698	***	-0.1153	***	0.0698	***
	[0.009]		[0.01]		[0.0108]		[0.01]	
GROWTH	0.001		0.0075	***	0.0085	***	-0.0075	***
	[0.0011]		[0.0014]		[0.0011]		[0.0014]	
ASSET STRUCTURE	0.2989	***	-0.2252	***	0.0736	***	-0.7748	***
	[0.0097]		[0.01]		[0.0097]		[0.01]	
TOTAL ASSETS	0.088	***	-0.0675	***	0.0204	***	0.0675	***
	[0.0036]		[0.0045]		[0.0041]		[0.0045]	
NDTS	-0.0381		0.1267	***	0.0886	**	-0.1267	***
	[0.0294]		[0.0358]		[0.0345]		[0.0358]	
CLUSTERING	-0.0092		0.0207	**	0.0115		-0.0207	**
	[0.0088]		[0.0101]		[0.01]		[0.0101]	
GINI-DOMESTIC	-0.0598		0.1362	*	0.0765		-0.1362	*
	[0.0586]		[0.074]		[0.0713]		[0.074]	
GINI-FOREIGN	0.1017	***	0.0034		0.1051	***	-0.0034	
	[0.0328]		[0.0344]		[0.0351]		[0.0344]	
R_squared	0.2266		0.1019		0.0303		0.411	
Obs.	25538		25538		25538		25538	

Notes: ***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively. Clustered robust standard errors (in brackets) are clustered at firm level. See Table 3 for variable definitions.

The estimated coefficients of Gini domestic and Gini foreign provide more insights into the effects of seasonality on firm capital structure. The estimation results suggest that while domestic tourist demand variations do not influence the amount of long-term and total debt in the financial structure, foreign tourist demand variations do. Therefore, it indicates that the seasonal demand of foreign tourists rather than domestic tourists increases the reliance of hospitality firms on long-term debt.

This result has important implications for hospitality firm financial policy, indicating that if a firm focuses on foreign tourists, long-term debt may be a more attainable financing

alternative than equity. Although we find no relationship between overall seasonal demand and STD and LIQ in Table 5, the estimated results of the decomposed Gini indices suggest a positive and negative relationship between the seasonal demand of domestic tourists with firm short-term debt and liquidity assets, respectively. Financing strategies may relate to the differences in the seasonality of the domestic and foreign tourists.

As discussed by Zhang et al. (2020) and suggested by the means and standard errors for Gini domestic and Gini foreign in Table 4, the degree of concentration is smaller for domestic tourism. The reason is that it is more feasible for domestic tourists to make short trips, and their demand is less constrained by institutional conditions (like the timing of holidays) compared to international tourists.

However, for much the same reason, the seasonal pattern for domestic tourists is more volatile and more predictable. Hospitality firms need to have sufficient capacity to meet the high concentrated demand of international tourists (usually summer in Norway). Therefore, the positive effect of Gini foreign on long-term and total debt is expected. Conversely, unpredictable seasonal demand from domestic tourists increases firm demand for more flexible financing sources like short-term debt (e.g., overdraft facilities).

6.3. Robustness tests

Our sample includes both restaurant and hotel firms[5], which may have different financing strategies. Our first robustness test involves adding industry fixed effects to the regressions,

[5] There are 1,085 hotels with a total of 6,567 observations, and 4,389 restaurants with 18,971 observations in the sample.

thereby controlling for six sub-sectors of the hospitality industry. As shown in Appendix 2, there are no significant changes in our results.

Our next robustness test involves estimating separate models for restaurant firms and hotel firms. Appendix 3 for restaurants shows that all the control variables that are significant in the models for the whole sample are still significant. We can also see that our industry specific variables (clustering and Gini indices) overall, are still significant determinants of capital structure in both the model using aggregate Gini index and the model using disaggregate Gini indices. However, like Li and Singal (2019) found when they divided the hospitality industry into its two main sectors, their results, like ours, for the two sectors, deviate somewhat from the aggregate estimation when it comes to industry specific variables. For restaurant firms, the Gini index for foreign tourists is still significant in the LTD and TD equation. The overall Gini index is still significantly affecting TD, but not LTD. For Gini domestic there are no changes at conventional significance levels. However, clustering no longer significantly affects short-term debt and liquidity.

Appendix 4 for hotels shows that the control variables still affect hotel firms the same way as hospitality firms, except for three coefficients, which are now significant at the 10% level (ROS in the LTD equation, and GROWTH in the STD and LIQ equation). However, results change for the NDTS variable as it no longer affects capital structure. We also show that clustering and seasonality still significantly affect capital structure in the hotel industry, however only the Gini overall index significantly affects total debt, while the disaggregated Gini indices are not significant. Clustering is now found to significantly affect long-term debt and total debt in both the model with aggregate Gini index and disaggregate Gini indices.

7. Conclusion

Since the development of the M&M propositions concerning capital structure, a large body of research has further developed and expanded these theories and empirically tested them in various industries. Several important factors, all highly relevant, are not included in the existing literature on capital structure in the hospitality industry. Among the most important factors are tourism seasonality and firm clustering. In this paper, we investigate whether these factors influence capital structure decisions in the hospitality industry while controlling for other factors influencing capital structure decisions.

We estimate four separate econometric models: one for each of the main capital structure components, namely long-term debt, short-term debt, total debt, and liquidity. We employ the Gini index to measure seasonal demand concentration. To capture the possible different impacts of tourism seasonality arising from different market segments on capital structure decisions, we disaggregate the measure of seasonality in terms of tourism segments, such as international and domestic tourists. Therefore, we construct three seasonality indices in total, one for total tourism demand, one for domestic tourist demand, and the last for foreign tourist demand. We first estimate the empirical models using only the overall Gini index, and then re-estimate them by replacing this with disaggregated indices for domestic and foreign tourists.

The estimated results suggest that firms facing higher seasonal demand rely more on long-term debt. The influence of seasonality on long-term debt also increases total debt for hospitality firms. One explanation is that it is easier for a hospitality company to persuade

long-term creditors to finance assets than to raise new equity payments from investors, as seasonality may add to the riskiness of firm cash flow. Creditors are also in a better position to recuperate some of their investment in a firm in case of bankruptcy compared to the equity holders, which only have a residual claim on the firm's assets.

Using disaggregated seasonality measures for foreign and domestic tourists, we found that the seasonality created by foreign tourists rather than domestic tourists makes firms more reliant on long-term debt capital. As discussed, the reasons are that hospitality firms need to have sufficient capacity to meet the highly concentrated demand of international tourists, which is more predictable. To increase capacity, firms then need to invest in facilities by establishing long-term loans with lenders (e.g., banks). Long-term debt and total debt are therefore expected to be high. Alternatively, the unpredictable seasonal demand of domestic tourists creates a need for the firms to be able to adjust their short-term debt and liquidity at short notice to cope with uncertain sales revenue.

Firm clustering is another important variable in the hospitality industry given that hotels and restaurants often locate together in a specific geographic region. There is a long debate concerning the supposedly positive spillover effects and rivalry between firms within the same region (Peiró-Signes et al., 2015; Marco-Lajara et al., 2014). Our econometric results reveal that the firms located within a dense cluster rely more on short-term debt and have less liquidity than otherwise. Greater competition between firms within denser clusters suggests that the competition in clusters drains firm liquidity, through either the liquidation of financial assets or the increase in short-term debt.

The estimated results for the control variables are mostly consistent with existing literature. Specifically, profitability decreases both long- and short-term debt and increases liquidity. The expectation is that profitable firms invest some of their profits in both short- and long-term financial assets. Growth firms usually have higher total debt and lower liquidity and firms with more collateral more easily establish long-term loans with banks. Larger firms generally have larger shares of liquidity as these companies have accumulated more liquid financial assets in their development.

Our results have significant theoretical and practical implications. Theoretically, our study suggests the importance of industry characteristics in capital structure determination. The hospitality industry is unique in terms of seasonal demand and co-location in small regions where customer demand is naturally restricted. These features affect demand and supply in the industry and are thus crucial in capital structure decisions. We therefore recommend the expansion of existing theoretical models to include industrial attributes. In their current forms, POF and TOT might make contradictory predictions about the relationship between seasonality and debt in some industries due to the different industrial properties. In addition, the POF predicts a negative relationship between clustering and debt, while we found a positive relationship between seasonality and STD (and hence debt financing) in this industry. As before mentioned, it is not clear how creditors evaluate the impact of tourism seasonality and clustering on the profitability and insolvency risk of the hospitability firms, an issue left for future research.

The study also has important implications for the financial management of firms in the hospitality industry. For firms that rely on demand from foreign tourists, long-term debt is

often required to build up the facilities needed to meet demand in peak seasons. Firms should also rely on short-term debt ready to cope with the more unpredictable demands of domestic tourists. Another important policy implication is that firms within a denser cluster have a different menu of finance options available, as they are typically more reliant on short-term debt financing. As firms often finance long-term projects with long-term capital, being reliant on short-term debt to finance operations in regions with denser clustering may indicate that this type of financing serves a substitute for long-term debt financing. In these regions, there may also be both greater competition for customers *and* in gaining sources of capital. Lastly, our results indicate that the increased competition in these clusters drains liquidity, through either the liquidation of financial assets or the increase in short-term debt.

One limitation of this study is that we did not consider long-term debt covenants. Covenants can lower the risk of the creditor and the cost of debt for the firm and therefore affect the supply and demand for long term debt. Additionally, firms' decisions of location may be affected by some unobservable factors, which also affect capital structure. How to control for the selection bias regarding the hotels' location is another direction for future study. Finally, it would be interesting to conduct a global analysis of hospitality firms from different countries and markets to see whether there are any significant differences between countries and markets. That is left for future research.

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Appendix

Appendix 1: Number of firms, overall Gini index and overnight stays, by region

Region	Average number of firms	Average value of overall Gini index	Average annual overnight stays
Finnmark	55	0.255	32414
Aust-Agder	63	0.240	18945
Hedmark	85	0.161	44011
Sogn og Fjordane	87	0.363	57905
Telemark	95	0.217	47214
Vest-Agder	100	0.242	49355
Østfold	102	0.165	28028
Vestfold	104	0.189	40710
Troms	111	0.106	67488
Møre og Romsdal	113	0.237	69819
Oppland	124	0.224	125606
Akershus	140	0.124	131494
Buskerud	148	0.142	119023
Nordland	180	0.235	73431
Hordaland	192	0.214	178233
Rogaland	210	0.135	112459
Trøndelag	277	0.137	140553
Oslo	369	0.114	305925

Notes: The table shows the 18 regions that Norway is divided into, and the average value of each variable during our sample years.

Appendix 2a. Robustness test: Estimation results with sector fixed effects for aggregated Gini index

Variable	LTD		STD		TD		LIQ	
ROS	-0.0455	***	-0.0696	***	-0.1152	***	0.0696	***
	[0.0088]		[0.01]		[0.0108]		[0.01]	
GROWTH	0.001		0.0075	***	0.0085	***	-0.0075	***
	[0.0012]		[0.0014]		[0.0012]		[0.0014]	
ASSET STRUCTURE	0.2989	***	-0.2251	***	0.0737	***	-0.7749	***
	[0.01]		[0.0102]		[0.0098]		[0.0102]	
TOTAL ASSETS	0.088	***	-0.0676	***	0.0205	***	0.0676	***
	[0.0037]		[0.0046]		[0.0042]		[0.0046]	
NDTS	-0.0387		0.1269	***	0.0882	**	-0.1269	***
	[0.0291]		[0.0357]		[0.0345]		[0.0357]	
CLUSTERING	-0.0073		0.0203	**	0.013		-0.0203	**
	[0.0088]		[0.0102]		[0.0099]		[0.0102]	
GINI-OVERALL	0.1296	**	0.1012		0.2308	***	-0.1012	
	[0.0626]		[0.0669]		[0.0672]		[0.0669]	
R_squared	0.2262		0.1019		0.0302		0.411	
Obs.	25538		25538		25538		25538	

Notes: The symbols ***, **, and * indicate significance at the 0.01, 0.05 and 0.10 levels, respectively. Clustered robust standard errors (in brackets) are clustered at firm level.

Appendix 2b: Robustness test: Estimation results with sector fixed effects for disaggregated Gini index

Variable	LTD		STD		TD		LIQ	
ROS	-0.0456	***	-0.0698	***	-0.1153	***	0.0698	***
	[0.0088]		[0.01]		[0.0108]		[0.01]	
GROWTH	0.001		0.0075	***	0.0085	***	-0.0075	***
	[0.0012]		[0.0014]		[0.0012]		[0.0014]	
ASSET STRUCTURE	0.2989	***	-0.2252	***	0.0736	***	-0.7748	***
	[0.01]		[0.0102]		[0.0098]		[0.0102]	
TOTAL ASSETS	0.088	***	-0.0675	***	0.0204	***	0.0675	***
	[0.0037]		[0.0046]		[0.0042]		[0.0046]	
NDTS	-0.0381		0.1267	***	0.0886	**	-0.1267	***
	[0.0291]		[0.0356]		[0.0345]		[0.0356]	
CLUSTERING	-0.0092		0.0207	**	0.0115		-0.0207	**
	[0.0088]		[0.0102]		[0.01]		[0.0102]	
GINI-DOMESTIC	-0.0598		0.1362	*	0.0765		-0.1362	*
	[0.0595]		[0.0755]		[0.073]		[0.0755]	
GINI-FOREIGN	0.1017	***	0.0034		0.1051	***	-0.0034	
	[0.0338]		[0.0353]		[0.036]		[0.0353]	
R_squared	0.2266		0.1019		0.0303		0.411	
Obs.	25538		25538		25538		25538	

Notes: ***, **, and * indicate significance at the 0.01, 0.05 and 0.10 levels, respectively. Clustered robust standard errors (in brackets) are clustered at firm level.

Appendix 3a: Robustness test: Estimation results for restaurant firms, aggregated Gini index

Variable	LTD		STD		TD		LIQ	
ROS	-0.0202	*	-0.033	***	-0.0532	***	0.033	***
	[0.0118]		[0.0117]		[0.0112]		[0.0117]	
GROWTH	0.0035		0.005	*	0.0085	***	-0.005	*
	[0.0029]		[0.003]		[0.0022]		[0.003]	
ASSET STRUCTURE	0.2767	***	-0.1569	***	0.1197	***	-0.8431	***
	[0.0224]		[0.021]		[0.0207]		[0.021]	
TOTAL ASSETS	0.1197	***	-0.0648	***	0.0549	***	0.0648	***
	[0.0092]		[0.0092]		[0.0089]		[0.0092]	
NDTS	0.0167		0.1197		0.1364		-0.1197	
	[0.0845]		[0.1006]		[0.1036]		[0.1006]	
CLUSTERING	-0.0895	***	0.0149		-0.0746	***	-0.0149	
	[0.0216]		[0.0163]		[0.0215]		[0.0163]	
GINI-OVERALL	0.1422		0.108		0.2501	**	-0.108	
	[0.1123]		[0.1097]		[0.1083]		[0.1097]	
R_squared	0.2066		0.0701		0.0608		0.4376	
Obs.	6567		6567		6567		6567	

Notes: ***, **, and * indicate significance at the 0.01, 0.05 and 0.10 levels, respectively. Clustered robust standard errors (in brackets) are clustered at firm level.

Appendix 3b: Robustness test: Estimation results for hotels, disaggregated Gini indices

Variable	LTD		STD		TD		LIQ	
ROS	-0.0202	*	-0.0330	***	-0.0532	***	0.0330	***
	[0.0117]		[0.0117]		[0.0111]		[0.0117]	
GROWTH	0.0034		0.0050	*	0.0085	***	-0.0050	*
	[0.0029]		[0.0030]		[0.0022]		[0.0030]	
ASSET STRUCTURE	0.2770	***	-0.1571	***	0.1200	***	-0.8429	***
	[0.0224]		[0.0210]		[0.0207]		[0.0210]	
TOTAL ASSETS	0.1195	***	-0.0647	***	0.0548	***	0.0647	***
	[0.0093]		[0.0092]		[0.0089]		[0.0092]	
NDTS	0.0149		0.1197		0.1346		-0.1197	
	[0.0842]		[0.1005]		[0.1032]		[0.1005]	
CLUSTERING	-0.0898	***	0.0148		-0.075	***	-0.0148	
	[0.0217]		[0.0163]		[0.0216]		[0.0163]	
GINI-DOMESTIC	-0.1022		0.1293		0.0272		-0.1293	
	[0.1150]		[0.1237]		[0.1189]		[0.1237]	
GINI-FOREIGN	0.0754		0.0312		0.1066	*	-0.0312	
	[0.0595]		[0.0580]		[0.0588]		[0.058]	
R_squared	0.2066		0.0702		0.0606		0.4377	
Obs.	6567		6567		6567		6567	

Notes: ***, **, and * indicate significance at the 0.01, 0.05 and 0.10 levels, respectively. Clustered robust standard errors (in brackets) are clustered at firm level.

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Appendix 4a: Robustness test: Estimation results for restaurant firms, aggregated Gini index

Variable	LTD		STD		TD		LIQ	
ROS	-0.0202	*	-0.033	***	-0.0532	***	0.033	***
	[0.0118]		[0.0117]		[0.0112]		[0.0117]	
GROWTH	0.0035		0.005	*	0.0085	***	-0.005	*
	[0.0029]		[0.003]		[0.0022]		[0.003]	
ASSET STRUCTURE	0.2767	***	-0.1569	***	0.1197	***	-0.8431	***
	[0.0224]		[0.021]		[0.0207]		[0.021]	
TOTAL ASSETS	0.1197	***	-0.0648	***	0.0549	***	0.0648	***
	[0.0092]		[0.0092]		[0.0089]		[0.0092]	
NDTS	0.0167		0.1197		0.1364		-0.1197	
	[0.0845]		[0.1006]		[0.1036]		[0.1006]	
CLUSTERING	-0.0895	***	0.0149		-0.0746	***	-0.0149	
	[0.0216]		[0.0163]		[0.0215]		[0.0163]	
GINI-OVERALL	0.1422		0.108		0.2501	**	-0.108	
	[0.1123]		[0.1097]		[0.1083]		[0.1097]	
R_squared	0.2066		0.0701		0.0608		0.4376	
Obs.	18971		18971		18971		18971	

Notes: ***, **, and * indicate significance at the 0.01, 0.05 and 0.10 levels, respectively. Clustered robust standard errors (in brackets) are clustered at firm level.

Appendix 4b: Robustness test: Estimation results for hotels, disaggregated Gini indices

Variable	LTD		STD		TD		LIQ	
ROS	-0.0202	*	-0.033	***	-0.0532	***	0.033	***
	[0.0117]		[0.0117]		[0.0111]		[0.0117]	
GROWTH	0.0034		0.005	*	0.0085	***	-0.005	*
	[0.0029]		[0.003]		[0.0022]		[0.003]	
ASSET STRUCTURE	0.277	***	-0.1571	***	0.12	***	-0.8429	***
	[0.0224]		[0.021]		[0.0207]		[0.021]	
TOTAL ASSETS	0.1195	***	-0.0647	***	0.0548	***	0.0647	***
	[0.0093]		[0.0092]		[0.0089]		[0.0092]	
NDTS	0.0149		0.1197		0.1346		-0.1197	
	[0.0842]		[0.1005]		[0.1032]		[0.1005]	
CLUSTERING	-0.0898	***	0.0148		-0.075	***	-0.0148	
	[0.0217]		[0.0163]		[0.0216]		[0.0163]	
GINI-DOMESTIC	-0.1022		0.1293		0.0272		-0.1293	
	[0.115]		[0.1237]		[0.1189]		[0.1237]	
GINI-FOREIGN	0.0754		0.0312		0.1066	*	-0.0312	
	[0.0595]		[0.058]		[0.0588]		[0.058]	
R_squared	0.2066		0.0702		0.0606		0.4377	
Obs.	18971		18971		18971		18971	

Notes: ***, **, and * indicate significance at the 0.01, 0.05 and 0.10 levels, respectively. Clustered robust standard errors (in brackets) are clustered at firm level.