The asset-light business model and firm performance in complex and dynamic environments: The dynamic capabilities view

Abstract

Although academic research examining the effects of the asset-light business model continues to grow in the tourism and hospitality literature, the extant studies lack comprehensive theoretical foundations to develop and establish clear quantitative models of analysis. Inconsistent findings from these studies call into question the issue of their exploratory nature. Using the dynamic capabilities view, this study provides a solid conceptual framework that recognizes the asset-light business model as an industry-specific dynamic capability for lodging firms. Furthermore, this study extends recent theoretical accounts on the moderating role of environments in the dynamic capabilities-performance relationship by focusing on the service-oriented and cyclical nature of the tourism and hospitality industry. Incorporating industry-specific performance measures, the current study suggests an alternative approach to the analysis of performance of a lodging firm. The findings also provide important implications to help lodging owners, managers, and investors to strategically cope with complex and dynamic environments.

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1. Introduction

Over the past decades, lodging firms have increasingly moved toward an asset-light business model (ALBM). ALBM allows lodging firms to expand and grow their business in scale through management and franchise agreements rather than owning hotels (Seo & Soh, 2019). In the early 1980s, lodging firms expanded across markets primarily using an exclusive owner-operator business model where owners acquire, build, and operate hotels. While substantial capital is tied up in illiquid fixed assets, the owner-operator would benefit from superior control of business as well as an increase in the value of real estate properties over time (Liow & Ingrid, 2008). Furthermore, asset-heavy lodging firms might receive more favorable terms from lenders when their fixed-assets are used as collateral, providing opportunities to reduce the cost of capital (Mun & Jang, 2017). The asset-intensive strategy works so long as hotels generate sufficient revenues to cover financing costs as well as property-related operating expenses (e.g., insurance and property taxes).

Despite some operational and financial merits, however, the asset-heavy business model has proven to be less flexible in responding to fast-changing business environments (Kachaner & Whybrew, 2014). In particular, asset-heavy lodging firms relying on external financing will likely struggle greatly during economic downturns as fixed operating and financing costs relative to their existing assets can lead to a further decline in profits (Sohn, Tang, & Jang, 2014). For

example, during the recession of the early 1990s, Marriott International Inc.'s heavy reliance on real estate development battered its bottom line because large interest and depreciation expenses relative to its real estate holdings constrained its operational flexibility (Farhi, 1990). In addition to the rigidity of financial management, the asset-heavy business model is also much less flexible in transforming internal resources or adopting external resources in accordance with the business environment changes than ALBM. For example, an owner-operator assumes more responsibility, greater control, and independence, which hinders modifying internal resources by other businesses or transferring external resources into the business (O'Neill & Carback, 2011). On the other hand, ALBM tends to allow more flexibility than asset-heavy business model because it can utilize various internal (e.g., franchise and management experience from different regions and environment) and external (e.g., finance, skill, knowledge of franchisees and independent local owners) resources from franchise and management contracts.

Since the economic recession in the 1990s, major international lodging firms have led the shift to ALBM. According to Smith Travel Research (STR), in 2019, approximately 80 percent of total branded rooms worldwide were franchised by the top 5 lodging brands, namely, Marriott International, Hilton Worldwide, Wyndham Hotels & Resorts, Choice Hotel International, and Intercontinental Hotels Group (JLL, 2019). One of the primary benefits of ALBM appears to be growth and expansion without significant commitment to capital investments (Li & Singal, 2019; Low, Das, & Piffaretti, 2015). In addition, lodging firms that embrace the asset-light strategy claim that ALBM allows them to achieve a steady cash flow from management and franchise fees and strong profitability and thereby, generate greater returns for owners and investors.

Recently, researchers have explored the effects of ALBM in a lodging setting. Several studies examined the asset-light strategy and its impacts on various outcome variables, such as financial performance (Blal & Bianchi, 2019; Sohn et al., 2013), real estate risk (Kim, Noh, & Lee, 2019), investment (Seo & Soh, 2019), and market risk (Sohn et al., 2014). Despite the general consensus that the asset-light strategy could be beneficial, empirical evidence has been somewhat inconsistent. Sohn et al. (2013) found a positive relationship between an asset-light/fee-oriented strategy and operating profitability and value of a firm, suggesting ALBM could contribute to improving financial performance. On the other hand, other scholars showed that ALBM had an insignificant or limited impact on the long-term performance of lodging firms (Blal & Bianchi, 2019; Yu & Liow, 2009). While the extant studies are mostly exploratory and without theoretical foundations, their mixed findings imply that the effect of the asset-light strategy is still questionable. More importantly, the effect of ALBM on lodging firms' core business operations has not yet been directly examined in the literature.

After identifying these research gaps in the literature, through this study we aim to provide a more comprehensive analysis of the performance of lodging firms that vary in the degree to which they commit to ALBM. In particular, the theory of DC was adopted in the current study to develop a conceptual framework to explore the effect of ALBM on firm performance. While previous theories, such as the resource-based perspective, attribute firms' economic profits to the possession of scarce resources, DC theory focuses on the development of new capabilities by effective strategic investments and/or knowledge management (Eisenhardt & Martin, 2000; Nieves & Haller, 2014). Teece, Pisano, and Shuen (1997) argued that "the term 'capabilities' emphasizes the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment" (p. 515). Furthermore, the DC view highlights that a firm's capability to reconfigure its existing resource

1 base depends on the environment in which it operates. In the lodging industry, where
2 performance is especially susceptible to dynamic and complex environmental changes, the
3 question regarding the effect of ALBM must be considered under these varying circumstances.
4 Concentrating on the service-oriented and cyclical nature of the lodging industry, we argue that
5 the effect of ALBM on performance is determined by environmental factors, such as complexity
6 of service operations and economic downturns.
7   Therefore, the purpose of this study is to examine: 1) the effect of ALBM on performance
8 and 2) the moderating effect of environmental forces on the ALBM-performance relationship.
9 Using the theory of DCs, this study marks the first time a theoretical framework has been
10 developed to explore the effect of ALBM. In addition, the industry-specific research design and
11 performance measurements used in this study provide a novel and alternative research approach
12 to analyze lodging firm performance covering different phases of economic cycles. The findings
13 of this study also provide important implications that can help lodging owners, managers, and
14 investors to strategically cope with the impact of complex and dynamic environments.
15
16 **2. Literature review**
17 *2.1. Dynamic capabilities (DC) approach*
18   The resource-based view (RBV) is considered one of the most influential theoretical
19 frameworks for understanding how firms achieve competitive advantage and how they can
20 maintain that advantage over time (Barney, Wright, & Ketchen, 2001; Newbert, 2007). In
21 particular, conceptualizing firms as bundles of resources, RBV emphasizes the importance of
22 resources in the development of competitive advantage (Peteraf & Barney, 2003). The key
23 assumption of RBV is that the valuable, rare, inimitable, and non-substitutable resources of a
24 firm generate superior performance, which prioritizes the possession of resources that are
25 capable of generating economic benefits (Barney, 1991; Peteraf. 1993). However, this
26 perspective focusing on the resources is challenged when highly competitive and volatile
27 business environments drive firms to reconfigure their resources to address new challenges and
28 opportunities (Carlbäck, 2016; D'Aveni, Dagnino, & Smith, 2010; Wang & Ahmed, 2007). In
29 such dynamic environments that requires more frequent reconfiguration of resources, the
30 capabilities by which a firm transforms its resources over time to adapt to changes in the
31 environment become the source of competitive advantage (Schilke, 2014; Wang & Ahmed,
32 2007).
33   To reconcile the challenges of RBV, the concept of DC has emerged. In particular, the
34 DC approach has become more influential because of increasingly unpredictable environmental
35 challenges, such as the global financial crisis, climate change, and emerging economies (Li &
36 Liu, 2014). DCs refer to "firms' processes that use resources – specifically the processes to
37 integrate, reconfigure, gain, and release resources – to match and even create market change.
38 DCs are thus the organizational and strategic routines by which firms achieve new resources and
39 configurations as markets emerge, collide, split, evolve, and die" (Eisenhardt & Martin, 2000, p.
40 1107). Prior research described DCs as specific strategic, organizational, and managerial
41 processes such as product development, alliancing, and strategic decision making that create
42 value for firms within dynamic markets by manipulating resources into new value-creating
43 strategies (Eisenhardt & Martin, 2000, Teece, Pisano, & Shuen, 1997). For instance, product
44 development routines by which managers combine their varied skills and functional backgrounds
45 to create revenue-producing products and services are such a DC (Helfat & Raubitschek, 2000).
46 DCs also include alliance and acquisition routines that bring new resources into the firm from

external sources (Paswan & Wittmann, 2009). Other DCs are related to strategic decision-making processes that lead firms to commit to research and development, expand internationally, and create global partnerships that can generate economic value (Ambrosini & Bowman, 2009).

In particular, the DC view emphasizes the importance of knowledge resources and learning mechanisms that allow firms to reconfigure their knowledge and experience with evolving environmental conditions (Teece et al., 1997; Zollo & Winter, 2002). Given that organizational processes designed to integrate knowledge-based resources within and across business organizations are critical to the creation and renewal of DCs, scholars argued that DCs are developed over time through complex interactions between knowledge, experience, and expertise (El akremi et al., 2015; Nieves & Haller, 2014). For example, several researchers showed how experience and heuristics can influence the development of effective DCs that lead to superior firm performance (Bingham, Eisenhardt, & Furr, 2007; Davis, Eisenhardt, & Bingham, 2009). Therefore, the processes used by management to transfer, share, and recombine knowledge resources within and across the organization are at the heart of the DC view. The identification of firm-specific processes in terms of their relationship to knowledge-based resources and learning mechanisms suggest that differences in these processes will likely lead to differences in the ability to develop DCs across different firms and industries.

2.2. ALBM as a specific DC of lodging firms

Despite the significance of DC, the application of the DC theory has been scarce in the tourism and hospitality literature. Earlier studies primarily discussed how various DCs such as innovation are related to competitive advantage and performance in the manufacturing and information technology sectors (Danneels, 2008; Fang & Zou, 2009; Leonidou, Leonidou, Fotiadis, & Aykol, 2015; Worren, Moore, & Cardona, 2002). Recently, however, several scholars argued that knowledge-based resources at the individual and collective level also play an important role in the development of DCs and competitive advantage in the service sector (Camisón & Monfort-Mir, 2012; Elsharnouby & Elbanna, 2021; Leonidou, Leonidou, Fotiadis, & Zeriti, 2013; Martínez-López & Vargas-Sánchez, 2013; Nieves, Quintana, & Osorio, 2016). In particular, the important role of knowledge resources in the hotel industry has been highlighted in that greater knowledge and experience with organizational tasks and activities can help develop DCs and competitive advantage among hotels (Nieves & Haller, 2014). Although the existing literature provides some insight into the links between knowledge-based resources and DCs in the lodging context, it does not specifically identify what are considered DCs for hotels. According to Eisenhardt and Martin (2000), DC is a set of identifiable and specific processes that have commonalities in key features across firms but idiosyncrasies in detail. This suggests that the DC of lodging firms should be 'best practice' which is generally conducted by hotels, but also contingent on firm-specific resources and capabilities (Helfat & Peteraf, 2003).

From this perspective, ALBM is one of the most relevant and representative practices for understanding DCs in the hotel industry. In particular, knowledge management and transfer through the franchise/management contract can constitute the essence of DCs for lodging firms. In the franchising context, franchisors (i.e., lodging firms) develop an environment and systems to foster knowledge creation and transfer among all members in the network that contribute to firm's competitive advantage (Paswan & Wittmann, 2009). For example, franchisors provide their franchisees with specific business practices, such as operating processes, production capabilities, marketing strategies, and regulatory know-how, that help improve performance of their franchisees. In doing so, lodging firms consistently recognize, assimilate, and improve their

knowledge-based resources through dynamic and complex communications with their franchisees (Brookes, 2014; El Akremi et al., 2015; Rosado-Serrano & Paul, 2018). By building strong partnerships with many franchisees in different markets, lodging firms could accumulate new resources and additional knowledge more efficiently, further developing operational know-how in various markets (Altinay, 2006; Altinay, Brookes, Madanoglu, & Aktas, 2014; Rosado-Serrano & Paul, 2018). According to El Akremi et al. (2015), a franchise chain with higher levels of prior franchising experiences, maturity, and globalization tend to exploit DCs better than their competitors as they have better learning capabilities, such as appropriately creating, transferring, and reconfiguring their resources. Previous studies further supported that proliferation of chain hotels by lodging firms qualifies as a DC because it is a repeated and reliable capacity that enables them to extend their resources in the form of physical outlets (Helfat & Winter, 2011; Nieves & Haller, 2014). Hence, the adoption of ALBM enables lodging firms to create network systems that effectively acquire, share, and manage knowledge-based resources. The foundation for expansion through ALBM relies on the firm's capability to replicate a complicated set of organizational and operational routines by which resources can be reorganized and/or reconfigured (Winter & Szulanski, 2001).

Another example is the application of organizational experience and expertise to brand and human capital management under management contracts. A management contract refers to an agreement between a management firm (i.e., lodging firm) and a property owner, whereby the management firm is responsible to manage the property for a fee using expertise and established procedures (Yang & Mao, 2017). While the management contracts allow lodging firms to effectively expand their operations with minimal investment, they also face challenges managing their brand and alliances in the network. For example, in order to sustain their brand and quality, they have to redeploy their core resources (e.g., standard operating procedures) across different markets involving various competitors, customers, and resources, such as human resources, suppliers, and infrastructures (Bouquet, Hébert, & Delios, 2004; Kruesi, Kim, & Hemmington, 2017; Villar, Pla-Barber, & León-Darder, 2012). Therefore, dynamic capabilities of the lodging firm to establish training and learning mechanisms that enable effective knowledge transfer to their local partners are critical in the achievement of superior performance (Paswan & Wittmann, 2009). The lodging industry is characterized by a high level of human capital, whose employees require high levels of professional skills and managerial expertise to provide idiosyncratic services (Sierra & McQuitty, 2005). Recently, several studies emphasized the role of knowledge resources in the form of brand and human capital management capabilities in the development of competitive advantage for hotel firms (Elsharnouby & Elbanna, 2021; Nieves & Haller, 2014). Therefore, ALBM enables greater learning and interaction between and among all members in the network, allowing effective management and transfer of knowledge resources (e.g., human capital, organizational knowledge) (Eisenhardt & Martin, 2000; Ivanova & Ivanov, 2015).

Hence, we argue that ALBM is not simply a way of expansion with limited capital investment but a specific DC of lodging firms that allows them to develop competitive advantage by integrating their knowledge-based resources into different markets and adjusting their expertise optimally to meet the needs or requirements of their partners (Deroos, 2010; Ivanova & Ivanov, 2015).

2.3. The effects of ALBM on performance

Due to their close association with competitive advantages, the relationship between firms' DC and their performance has been widely explored in the literature. Teece (2007, p.

1320) stated that "the ambition of the dynamic capabilities framework is nothing less than to explain the sources of enterprise-level competitive advantage over time" and that "dynamic capabilities lie at the core of enterprise success (or failure)." While the literature generally provides support for a positive link between DC and performance, scholars further argue that specific function-based or process-based DC can better explain their contribution to competitive advantage and firm performance (Combs & Ketchen, 1999; Henderson & Cool, 2003; Karna et al., 2016; Pezeshkan et al., 2016). That is, DC in specific functional or procedural domains may have a more direct impact on performance (Schilke, 2014). Empirical studies identified specific DC that leads to superior firm performance, such as management capabilities (Makadok, 2001; Teece et al., 1997), product and process development (Stalk, Evans, & Shulman, 1992; Newbert, 2007), marketing capabilities (Vorhies, Morgan, & Autry, 2009; Vorhies & Morgan, 2005), organizational learning and adaptation (Romme et al., 2010; Zahra & George, 2002), technological innovation (Cho & Pucik, 2005; Danneels, 2002), and knowledge integration and creation (Eisenhardt & Martin, 2000; Zollo & Winter, 2002).

From the DC perspective, therefore, ALBM is identified as one of the specific DCs for lodging firms that facilitates the modification and renewal of currently possessed resources in accordance with the environmental changes to gain competitive advantages over their competitors and, thereby, achieve superior firm performance (Helfat et al., 2009; Eisenhardt & Martin, 2000; Teece et al., 1997; Zahra, Sapienza, & Davidsson, 2006). However, no empirical research has been conducted to analyze whether DC can provide hotels with competitive advantages or how DC can influence their financial performance. Hence, in this study we argue that the financial performance of lodging firms is enhanced as they implement higher levels of ALBM. To test this relationship, we employed unique industry-specific performance measures (e.g., room revenue, occupancy, and average daily room rate) as well as accounting- and market-based performance measures. Given the multidimensional aspects of performance, researchers emphasized the specification of performance measures as they can reflect different concepts of performance (Richard et al., 2009). Industry-specific performance measures used in this study (both sides of franchiser and franchisees or management and managed companies) are directly connected to organizational effectiveness of lodging firms, evaluating how performance is improved in the most efficient manner because they are not influenced by the revenue from franchise or management fees. Therefore, the following hypothesis is proposed.

H1: There is a positive relationship between ALBM and firm performance.

2.4. The effects of ALBM and service complexity

Despite overall support for a positive relationship between DC and performance, it is argued that the relationship is not automatically guaranteed but is contingent on the environment in which businesses operate (Drnevich & Kriauciunas, 2011). The environment is viewed as a set of properties that characterize the condition of the surroundings (Azadegan et al., 2013). Recognizing its diverse nature, Dess and Beard (1984) classified the characteristics of the environment through complexity, dynamism, and munificence. Of these factors, the extant research particularly emphasized the importance of environmental complexity and environmental dynamism in explaining the DC-performance relationship while assuming a firm can actively adapt to the environment, at least to some extent, within the limits of its resources and capabilities (Helfat & Winter, 2011; Schilke, 2014; Teece & Pisano, 1994).

Environmental complexity refers to the depth and breadth of heterogeneity caused by various inputs and outputs in an organizational environment (Dess & Beard, 1984). Azadegan et al. (2013) argued that firms will likely face more challenges when they deal with more inputs (e.g., customers and products) and outputs (e.g., suppliers and materials). For example, firms with a complex supply chain may experience difficulties managing the logistics and delivery of raw materials and products. Firms with a more diverse customer base require more complicated production and operation processes, which can constrain their ability to respond to changes in customer preferences. Therefore, when the complexity of the environment is high (low), DC will have a greater (weaker) impact on their competitive advantage, which in turn affects performance. The existing research found a moderating role of environmental complexity in the relationship between DC and performance among firms in automobile, pharmaceutical, and aerospace industries (Altria et al., 2009; Brox & Fader, 2002; Ehret & Cooke, 2010).

Although empirical evidence is well documented in the context of manufacturing industries, little effort has been made to explore the role of environmental complexity in the service industry. However, it is important to consider the service component in the environment as the core idea of the DC view is to respond to customers' changing demand for services as well as products (Teece et al., 1997). In particular, Kindstrom, Kowalkowski, and Sandberg (2013) argued that service-oriented management approaches such as service innovation are essential in shaping new markets, suggesting that services constitute an important dimension of the external environment.

Given the service aspect is particularly important in the lodging industry, where hotels serve a variety of customers whose needs are sufficiently different, key aspects of services vary greatly from one hotel to another (Tanford et al., 2011). Consequently, lodging markets are often classified based on the level of service offered by a hotel (Enz, 2010). For instance, full-service hotels offer a wide range of services and amenities (e.g., food and beverage, concierge, and room service) whereas limited-service hotels typically focus on basic facilities. Due to this wide variation in services, many lodging firms operate a broad portfolio of hotels to serve various market segments (Chu & Choi, 2000; Kim, Cho, & Brymer, 2013). Research shows, however, that operating more full-service hotels with complicated service features and maintaining high quality service standards across chain outlets increase levels of complexity intrinsic to the service within an organization (Enz, Potter, & Siguaw, 1999; Peng, Zhao, & Mattila, 2015; Wu, Liao, & Hung, 2012).

Therefore, based on the DC view, we argue that the positive impact of DC on performance will be enhanced for lodging firms as they include and operate more full-service hotels in their portfolios. That is, lodging firms facing higher levels of complexity will benefit more from adopting ALBM to cope with complexity in service operations and thereby, achieve superior performance. Therefore, the following hypothesis is proposed.

H2: The positive effect of ALBM on performance is stronger for lodging firms that include more full-service hotels in their portfolios.

2.5. The effects of ALBM and economic downturns

Implicit in the definition of DC is that business environments are dynamic in nature (Helfat et al., 2009). In particular, Miller and Friesen (1983) perceive main characteristics of dynamic environments as the uncertainty, instability, and volatility of the changes in competition, customer preferences, business practices, and production and service technologies.

Hence, environmental dynamism refers to "the change of the competitive environment, which has an impact on the way companies compete with others and how they respond to the demands of the client" (Drnevich & Kriauciunas, 2011, p. 254). Therefore, in highly dynamic environments, where the markets are rapidly changing and evolving, firms that can take advantage of new changes will benefit more from developing DC (Azadegan et al., 2013; Li & Liu, 2014).

Given that the effect of DC is contingent on the environments in which firms operate, researchers have examined the moderating role of environmental dynamism in the DC-performance relationship. Findings show that the effects of DC are moderated by environmental dynamism that is operationalized as the variability and/or volatility of various business activities, such as sales (Boyd, Gove, & Hitt, 2005; Dess & Beard, 1984), shipments (Goll & Rasheed, 2004), and technologies (DeSarbo et al., 2006; Wang, Senaratne, & Rafiq, 2015). The moderating effect was also found in other studies where environmental dynamism was operationalized with survey responses to various dimensions such as product/service change, environmental demands, marketing practices, environmental changes, and new business models (Augier & Teece, 2009; Karn, Richter, & Riesenkamff, 2016; Li & Liu, 2014; Schilke, 2014).

As dynamism refers to changing environments, business cycles constitute another important dimension of environmental dynamism (Makkonen et al., 2014). In particular, Steenkamp and Fang (2011) argued that DC will have a more significant impact on the performance of a firm in turbulent circumstances. For example, the effect of DC will be enhanced during economic downturns, such as financial crises, because management decisions directly relate to the survival of the firm. Under this critical circumstance, a few unconventional, flexible, and quick management decisions from various experiential resources play an essential role in turning around the situations. On the other hand, firms may find DC less effective during economic upturns as they may benefit from a strong economy regardless of their levels of competitive advantage. Several studies found empirical evidence for the moderating role of economic cycles in the DC-performance relationship (Frankenberger & Graham, 2003; (Makkonen et al., 2014; Newey & Zahra, 2009). Comparing market risk exposure among lodging firms, Sohn, Tang, and Jang (2014) showed that lodging firms enjoy the benefits of the asset-light and fee-oriented strategy in both contraction and expansion periods. However, their findings needed to be interpreted with caution due to a fairly small and unbalanced dataset with only 33 observations for contraction periods.

Building on the DC-based view, therefore, in this study we argue that the moderating effect of environmental dynamism is stronger during economic downturns than economic upturns since the value of DC is maximized because there are more occasions to exercise them to respond to external shocks and challenges. The following hypothesis is proposed.

H3: The positive effect of ALBM on performance is stronger for lodging firms during economic downturns than economic upturns.

3. Method
3.1. Sample and data collection
U.S. lodging firms publicly traded between 1998 and 2019 comprise the sample of this study. To construct our measures, we manually retrieved detailed property-related information in the asset portfolio of each lodging firm over time. In particular, we reviewed firms' quarterly reports (10Q) and annual reports (10K) to obtain property-related information, such as the

number of properties that are managed and/or franchised, and the number of properties that are categorized as full-service or limited-service hotels. Consistent with previous studies, quarterly accounting and financial data of lodging firms were collected using two main databases (Seo & Soh, 2019; Sohn et al., 2013, 2014). Various financial and share price data were retrieved from the Compustat and the Center for Research in Security Prices (CRSP) database using the Standard Industrial Classification (SIC) code of Hotels and Motels (7011). To minimize the effect of the extreme values of an outlier, data were winzorized at the 1st and 99th percentiles on a quarterly basis (Baker et al., 2003). After removing data with missing values, the final sample was 720 firm-quarter observations.

3.2. Variables

 Dependent variable. Considering multi-dimensions of firm financial performance, this study incorporated five measurements. First, return on assets (ROA), operationalized as net income divided by total assets, was used to measure an accounting-based profitability (Goll & Rasheed, 2004). Second, Tobin's Q, defined as the ratio of the market value of total assets to the book value of total assets, was proxied for a market-based performance (Tobin, 1969). In addition, revenue per available room (RevPAR), average daily rate (ADR), and occupancy rate (Occ) were used as an operational performance indicator. RevPAR represents the revenue generated per room, computed as the total room revenue divided by the sum of company-owned and franchised/managed rooms available. ADR indicates the average rate paid per occupied room, calculated by dividing the total room revenue by the total number of rooms sold. Occ is the percentage of rooms sold, defined as the ratio of the total number of rooms occupied to the total number of rooms available. An industry-specific performance indicator, such as RevPAR, ADR, and Occ, can help extend our understanding of operational effectiveness of lodging firms (STR, 2019).

 Independent and moderating variables. Our independent variable is the degree of asset-lightness (AL), measured as the sum of franchised and managed properties divided by the total number of properties (Blal & Bianchi, 2019; Seo & Soh, 2019). Property-related data (e.g., number of franchised and managed hotels) were collected from firms' quarterly and annual reports. In this study, we have two moderating variables. First, environmental complexity was operationalized as the variability in the level of services, which is the ratio of the total number of full-service hotels to the sum of full-service and limited-service hotels (FS) (Seo & Soh, 2019). Second, environmental dynamism (ED) is a binary variable that takes a value of 1 for economic downturns, and 0 otherwise. Following previous research in using the National Bureau of Economic Research to determine economic conditions, we identified periods of economic downturn as 2001-2003 and 2008-2010, and periods of economic growth as 1998-2000, 2004-2007, and 2011-2019 (Ahmed et al., 2014; Nason & Patel, 2016). The prediction is that the effect of AL may vary between full-service and limited-service market segments, as well as across different economic cycles.

 Control variables. This study includes several control variables. First, we controlled for firm size as the ability to acquire and deploy resources can vary across firms. Firm size (Size) is operationalized as the log of sales (Ahmed et al., 2014). Second, prior research shows that leverage can influence firms' strategic decisions and performance (Barclay & Smith, 1995). Highly leveraged firms are more vulnerable to financial distress and therefore, less likely to engage in business activities that increase the risk of default (Guedes & Opler, 1996). Leverage (LEV) is measured as the total long-term debt divided by market value of the firm (Stohs &

Mauer, 1996). Lastly, firms that are financially flexible may achieve superior performance because they have more financial resources to deploy (Boulding & Staelin, 1995). The log of cash flow (CF) was used to control for this effect. The means, standard deviations, and correlations for all variables used in the study are shown in Table 1.

Table 1
Means, standard deviations, and correlations

Variable	Mean	SD	$ROA_{i,t}$	$Q_{i,t}$	$RevPAR_{i,t}$	$ADR_{i,t}$	$Occ_{i,t}$	$AL_{i,t}$	$FS_{i,t}$	$ED_{i,t}$	$SIZE_{i,t}$	$LEV_{i,t}$	$CF_{i,t}$
$ROA_{i,t}$	0.04	0.04	1.00										
$Q_{i,t}$	2.24	1.79	0.62**	1.00									
$RevPAR_{i,t}$	110.87	74.13	0.29**	0.27**	1.00								
$ADR_{i,t}$	148.33	77.02	0.31**	0.28**	0.99**	1.00							
$Occ_{i,t}$	0.58	0.28	0.12**	0.02*	0.79**	0.82*	1.00						
$AL_{i,t}$	0.83	0.27	0.12**	0.20**	0.27**	0.03*	0.03*	1.00					
$FS_{i,t}$	0.50	0.36	0.32**	0.37**	0.66**	0.68**	0.29**	0.33**	1.00				
$ED_{i,t}$	0.29	0.45	-0.10**	-0.01**	-0.09*	0.09*	-0.11*	0.04	0.15	1.00			
$SIZE_{i,t}$	3.46	0.61	0.09*	0.26**	0.22**	0.26**	0.03	-0.19**	-0.01	-0.79**	1.00		
$LEV_{i,t}$	0.38	0.21	-0.42**	-0.51**	0.40**	0.37**	0.15**	-0.01	0.47*	0.18**	-0.13**	1.00	
$CF_{i,t}$	0.13	0.25	0.78**	0.59**	-0.28**	-0.31*	-0.01	0.10*	-0.36**	-0.12**	-0.14*	-0.35**	1.00

* significant at 0.05, ** significant at 0.01.
Note: ROA is return on assets, operationalized as net income divided by total assets; Q is Tobin's Q, defined as the ratio of the market value of total assets to the book value of total assets; RevPAR is revenue per available room measured as the total room revenue divided by the total number of rooms available; ADR is average daily rate calculated by dividing the total room revenue by the total number of rooms sold; Occ is occupancy, defined as the ratio of the total number of rooms occupied to the total number of rooms available; AL represents the degree of asset-lightness of a firm; FS indicates the degree of full-service hotels that a firm operates in its portfolio, operationalized as the ratio of the total number of full-service hotels to the total number of hotels; ED is environmental dynamism, coded 1 for economic downturns and 0 otherwise; SIZE is firm size, measured as the log of sales; LEV indicates levels of leverage, proxied as long-term debt divided by the market value of the firm; CF is cash flow, operationalized as the log of cash flow

3.3. Model specification

This study adopted a longitudinal design to analyze time-series observations across cross-sectional units. Specific panel regression models to test each hypothesis are presented below.

Regression equation to test Hypothesis 1:
$$PER_{it} = \beta_0 + \beta_1 AL_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CF_{it} + \varepsilon_{it} \,, \qquad (1)$$

Regression equation to test Hypothesis 2:
$$PER_{it} = \beta_0 + \beta_1 AL_{it} + \beta_2 FS_{it} + \beta_3 (AL * FS)_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 CF_{it} + \varepsilon_{it} \,, \qquad (2)$$

Regression equation to test Hypothesis 3:
$$PER_{it} = \beta_0 + \beta_1 AL_{it} + \beta_2 ED_{it} + \beta_3 (AL * ED)_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 CF_{it} + \varepsilon_{it} \,, \qquad (3)$$

where PER is firm performance, measured as ROA, Tobin's Q, RevPAR, ADR, and Occ; AL represents the degree of asset-lightness of a firm; FS indicates the degree of full-service hotels that a firm operates in its portfolio, operationalized as the ratio of the total number of full-service hotels to the total number of hotels; ED is environmental dynamism, coded 1 for economic downturns and 0 otherwise; SIZE is firm size, measured as the log of sales; LEV indicates levels

of leverage, proxied as long-term debt divided by the market value of the firm; CF is cash flow, operationalized as the log of cash flow; (AL*FS) and (AL*ED) indicate the interaction of AL and full-service and environmental dynamism, respectively.

Prior research showed that when explanatory and control variables are correlated with the errors an ordinary least square (OLS) procedure could produce inconsistent and biased parameter estimates, leading to spurious results (Petersen, 2009; Wooldridge, 2002). Although OLS estimation requires the strict exogeneity assumptions, it is likely that there may exist some unobserved factors that affect the dependent and explanatory variables while some explanatory variables can be related to past values of the dependent variables in the regression. For instance, unobservable factors, such as risk-taking propensities of managers, may affect a firm's asset structure and/or performance. To overcome the estimation problems that may be introduced by unobservable heteroskedasticity and endogeneity, we employed a dynamic generalized method of moments (GMM) panel estimator with instruments (Arellano & Bond, 1991; Arellano & Bover, 1995; Blundell & Bond, 1998). The GMM estimation procedure consists of two steps. First, we first-differenced all variables in the estimation models to eliminate any potential bias that may arise from unobserved heterogeneity. After first-differencing, we estimated each model using GMM with lagged values of the dependent, explanatory, and control variables as instruments. In particular, following previous studies, two lagged values of the relevant variables were used as instruments in the GMM estimation procedure (Glen, Lee, & Singh, 2001; Gschwandtner, 2005). In addition, we analyzed variation inflation factors from regression models (2) and (3) to check multicollinearity because they included multiple interaction terms. To mitigate potential multicollinearity problems, we centered the main effect variables before creating interactions (Aiken & West, 1991). Finally, to avoid potential simultaneity issues, all independent and control variables were lagged one period to allow their temporal precedence over dependent variables (Buch et al., 2013).

4. Results

4.1. The effect of ALBM on performance

Hypothesis 1 tests for the effect of ALBM on firm performance. Regression model (1) was estimated using the dynamic panel GMM estimator with instruments. The Hansen J test was also conducted to check the validity of our instruments (Hansen, 1982). Table 2 shows the results of regressing various performance measures on AL. All J-statistics ($p > .05$) in Table 2 indicated that we cannot reject the null hypothesis that our instruments are valid. The coefficients of AL are positive and significant across all performance measures ($p < .05$), providing support for Hypothesis 1. In particular, the economic effect of AL on performance is stronger for lodging performance indicators (i.e., RevPAR, ADR, Occ), compared to accounting- and market-based measures (i.e., ROA, Q). Consistent with previous research, therefore, our findings indicate that ALBM helps lodging firms improve operational performance by effectively allocating and restructuring their resources.

Table 2

The effect of ALBM on performance

	Dependent variables				
	ROA	Q	RevPAR	ADR	Occ
$AL_{i,t}$	0.005*	0.102*	0.086**	0.043*	0.108*
	(2.34)	(2.30)	(3.86)	(2.41)	(2.29)

	SIZE$_{i,t}$	0.008	0.278	0.187**	0.103**	0.114*
		(1.36)	(1.31)	(3.87)	(3.61)	(2.73)
	LEV$_{i,t}$	-0.019*	-0.063**	-0.284	-0.128*	-0.124*
		-(2.26)	-(3.75)	-(1.89)	-(2.32)	-(2.46)
	CF$_{i,t}$	0.041*	1.148*	0.066*	0.087*	0.119*
		(2.44)	(2.29)	(2.49)	(2.46)	(3.12)
	N	705	705	594	588	588
	J	0.87	0.41	0.52	0.75	0.47

1 Notes: * significant at 0.05, ** significant at 0.01
2 The *J*-statistic follows a chi-squared distribution with (*I-r*) degrees of freedom. Where *I* is the number of moment
3 conditions and *r* the parameters to be estimated under the null hypothesis that all instruments are valid.
4
5 *4.2. The effect of ALBM in complex environments*
6   Table 3 presents the regression results with service complexity as a moderating variable.
7 In line with previous analyses, the dynamic GMM panel method of estimation with instruments
8 was used to estimate regression model (2). The results of Hansen *J* test indicate that the null
9 hypothesis that the moment conditions are correctly specified cannot be rejected at all
10 significance levels. In addition, all variation inflation factors are below 10, indicating the absence
11 of serious multicollinearity (Cohen et al., 2003). While the coefficients of AL and FS are positive
12 and significantly related to performance, we argued that the benefits of ALBM could be more
13 prominent for lodging firms facing higher levels of service complexity. Across all models, the
14 signs and relationships between interaction term estimates (AL*FS) and performance are
15 positive and significant (p < .05), lending support to the role of service complexity as a
16 moderator. Findings suggest that ALBM has a relatively stronger impact on performance of
17 lodging firms when they experience greater complexity in their service operations. This supports
18 our argument that ALBM is an effective strategic option for lodging firms that helps enhance
19 their capabilities to cope with more complex environments.
20
21 **Table 3**
22 The moderating effect of service complexity on the ALBM-performance relationship

	Dependent variables				
	ROA	Q	RevPAR	ADR	Occ
AL$_{i,t}$	0.026*	0.161*	0.441*	0.084*	0.068*
	(2.54)	(3.12)	(2.28)	(2.34)	(2.41)
FS$_{i,t}$	0.070*	0.036*	0.094*	0.076*	0.044*
	(2.39)	(2.68)	(2.34)	(2.27)	(2.26)
(AL*FS)$_{i,t}$	0.008*	0.064*	0.048*	0.093*	0.076*
	(2.18)	(2.20)	(2.33)	(2.31)	(2.27)
SIZE$_{i,t}$	0.030*	0.024**	0. 012**	0.072**	0.037**
	(2.92)	(3.24)	(3.76)	(3.51)	(4.12)

LEV$_{i,t}$	-0.005**	-0.066**	-0.059	-0.037*	-0.083
	-(4.11)	-(3.98)	-(1.34)	-(2.33)	-(1.46)
CF$_{i,t}$	0.020**	0.049**	0.028	0.048	0.031
	(3.68)	(4.33)	(1.85)	(1.47)	(1.66)
N	705	705	594	588	588
J	2.64	1.88	1.57	1.61	1.49

1 Notes: * significant at 0.05, ** significant at 0.01, *** significant at 0.001
2 The *J*-statistic follows a chi-squared distribution with (*I-r*) degrees of freedom. Where *I* is the number of moment
3 conditions and *r* the parameters to be estimated under the null hypothesis that all instruments are valid.
4
5 *4.3. The effect of ALBM during economic downturns*
6   Hypothesis 3 tests for the moderating effect of environmental dynamism. Table 4
7 provides the results of the dynamic GMM panel estimation with instruments. All relevant
8 statistics (*J* statistics and variance inflation factors) indicate that endogeneity and
9 multicollinearity are not a serious issue in our analyses. As expected, economic downturns are
10 negatively associated with firm performance. These relationships are generally consistent and
11 significant across all performance measures, except for ROA. Hypothesis 3 states that the
12 performance implications of ALBM are stronger in more dynamic environments such as
13 economic downturns. The significantly positive regression coefficients of interaction term
14 (AL*ED) for all performance measures provide support for Hypothesis 3. These findings suggest
15 that ALBM is significantly more effective in maintaining profitability and protecting against loss
16 in declining economic markets.
17
18 **Table 4**
19 The moderating effect of economic downturns on the ALBM-performance relationship

	Dependent variables				
	ROA	Q	RevPAR	ADR	Occ
AL$_{i,t}$	0.077*	0.037	0.017*	0.078*	0.082*
	(2.25)	(1.98)	(2.36)	(2.41)	(2.78)
ED$_{i,t}$	-0.001	-0.033*	-0.014*	-0.028*	-0.092*
	-(1.36)	-(2.27)	-(2.33)	-(2.19)	-(2.83)
(AL*ED)$_{i,t}$	0.003*	0.057*	0.052*	0.063*	0.055*
	(2.48)	(2.54)	(2.41)	(2.27)	(2.32)
SIZE$_{i,t}$	0.046**	0.068*	0.054*	0.035*	0.079*
	(3.91)	(2.29)	(2.44)	(2.43)	(2.21)
LEV$_{i,t}$	-0.013*	-0.058*	-0.003	-0.011*	-0.005*
	-(2.31)	-(2.47)	-(2.08)	-(2.28)	-(2.46)
CF$_{i,t}$	0.066*	0.004	0.077	0.019**	0.028*
	(2.27)	(1.75)	(1.58)	(3.78)	(2.24)

N	705	705	594	588	588
J	1.11	1.76	1.33	1.36	1.40

Notes: * significant at 0.05, ** significant at 0.01, *** significant at 0.001
The *J*-statistic follows a chi-squared distribution with (*I-r*) degrees of freedom. Where *I* is the number of moment conditions and *r* the parameters to be estimated under the null hypothesis that all instruments are valid.

4.4. Robustness analysis

To ensure the robustness of the findings, we conducted a series of additional analyses. First, we estimated our models with alternative measurements to address potential measurement problems. Instead of ROA, the hypotheses were tested using return on sales (ROS) and return on equity (ROE) as dependent variables (Azadegan et al., 2013). ROS was measured as dividing net income by sales while ROE was calculated as net income divided by shareholders' equity. In addition, following Rajan and Zingales (1995), asset-lightness was proxied by asset tangibility, measured as the ratio of fixed assets to total assets. Although not tabulated, findings were generally significant and qualitatively similar in that ALBM positively affects firm performance. Second, to validate the findings that economic downturns moderate the DC-performance relationship, we retested relevant hypotheses where data were grouped into two sub-samples, economic downturn and economic growth. Previous research shows that estimations of regression models using more stringent samples further validate the findings (Bamiatzi et al., 2016). Proposed hypotheses were supported, confirming the impact of economic slowdown was less prominent for lodging firms with higher levels of ALBM.

5. Discussion and conclusions

The purpose of this study was to examine whether ALBM, as an industry-specific DC, would significantly explain the financial performance of a lodging firm. Moreover, we assessed the degree to which various characteristics of the external environment in which lodging firms operate, such as environmental complexity and environmental dynamism, moderated the relationship between ALBM and firm performance. Based on the framework of the DC theory, three main hypotheses were developed and tested using a fixed-effects model with clustered standard errors (Petersen, 2009). The first hypothesis assessed whether ALBM of lodging firms was a significant predictor of their financial performance. Indeed, ALBM was positively related to firm performance. Consistent with previous research, therefore, our findings highlighted the critical role of DC in achieving competitive advantage and improved performance (Eisenhardt & Martin, 2000; Helfat & Winter, 2011; Teece & Pisano, 1994). The more interesting result, however, is that the economic effect of ALBM on performance is more prominent with industry-specific performance measures (i.e., RevPAR, ADR, Occ) than accounting- and market-based measures (i.e., ROA and Tobin's Q). Our findings suggest that although accounting- and market-based performance measures are broadly adopted in the literature, the integration of industry-specific indicators can provide more rigorous and meaningful analysis of changes in performance (Richard et al., 2009).

The second hypothesis proposes that environmental complexity moderates the effect of DC on firm performance. In particular, the moderating effect is expected to be stronger for asset-light lodging firms that operate more full-service hotels (i.e., a more complex environment). Results supported the hypothesis, validating the theory of DC that firms will likely benefit most from the development of DC when their operational and procedural processes are more complicated (Lin & Wu, 2014; Schilke, 2014). In light of evolving customer expectations and

preferences for services, full-service hotels will likely face more challenges related to service quality and customer satisfaction because of the design and delivery of complex service operations (Kandampully et al., 2018). Under such a complicated business environment, ALBM is more likely to achieve a competitive advantage than asset-heavy firms, by focusing its resources on core business. For instance, after selling real estate properties, Hyatt Hotels Corporation invested its free capital in marketing, staff training, and technology (Ting, 2017). Our findings, therefore, call for the need to implement strategies that can help improve and optimize the efficiency and profitability of service operations.

The last hypothesis tests for the moderating effect of environmental dynamism on the relationship between DC and performance. Despite the impact of global economic slowdown, significantly positive effects of ALBM are present for all performance measures in the results. However, the overall economic effect of ALBM decreased modestly in the moderating model. Such a finding can be explained by the fact that, though ALBM can lead to superior performance, firms are still impacted by substantial declines in consumption and business activities. Therefore, our findings identify the importance of ALBM as an effective risk management strategy during economic downturns in addition to profit maximizing strategy. Researchers also emphasize the critical role of risk management strategy in periods of business contractions (Makkonen et al., 2014). Based on these findings, both theoretical and practical implications are discussed next.

5.1. Theoretical contribution

Although academic research examining the effect of ALBM continues to grow in the tourism and hospitality literature, the extant studies lack comprehensive theoretical foundations to develop and establish clear quantitative models of analysis. Inconsistent findings from these studies call into question the issue of their exploratory nature (Blal & Bianchi, 2019; Low et al., 2015; Sohn et al., 2013). Using the theory of DC, this study is first to provide a solid conceptual framework for the analysis of ALBM in the lodging industry. In particular, recognizing ALBM as an important industry-specific DC and analyzing its role in contributing to firm performance adds to the discussion of the DC-performance relationship in the literature.

Furthermore, this study extends recent theoretical accounts on the moderating role of environment in the DC-performance relationship. Scholars argued that the benefits of DC are contingent not only on the existence of the DC, but also on the context or environment in which the DC is implemented (Helfat et al., 2009; Schilke, 2014). Findings of this study highlighted the potential for improving the extant research by testing the moderating role of more relevant contextual variables in an organization. By focusing on the service-oriented and cyclical nature of the tourism and hospitality industry, the DC-performance model could gain a more robust perspective encompassing industry-specific measures, which effectively reflects the central idea of the DC view that conditions of the surroundings vary across organizations and industries (Li & Liu, 2014; Wang et al., 2015).

Finally, by incorporating an industry-specific performance measure, RevPAR, ADR, and Occ, the current study provides an alternative approach to the analysis of performance of a lodging firm. Researchers have argued that firm performance is a multidimensional construct that reflects many different aspects of performance beyond profits and value (Bromiley, 1990; Thaler, 2004). In particular, Richard et al. (2009) emphasized organizational effectiveness as a specific aspect of performance because the meaning of performance could vary across organizations in different industries. In addition to accounting- and market-based performance

measures, the current study considers firm-level RevPAR, ADR, and Occ as a unique industry performance measurement that can assess organizational effectiveness in the lodging industry. RevPAR, ADR, and Occ, compared to the general performance measures in the literature, better integrates with our industry-specific research design.

5.2. Practical implications

Our findings provide several important implications for owners, managers, and investors in the lodging industry. The current study revealed that while ALBM positively affects financial performance of a lodging firm, this effect is dependent on specific characteristics of the environment, such as environmental complexity and environmental dynamism. First, a stronger effect of ALBM for lodging firms operating primarily full-service hotels suggests the integration of service-centric perspectives into the asset allocation process has the potential to drive greater profits and growth. Given that ALBM allows reconfiguration of resources, lodging owners and managers would consistently face a challenge to balance resources related to product-focused and service-focused activities. However, less strategic attention is paid to services because delivery of services generally takes place via interactions with customers at an operational level (Kindström et al., 2013; Martin & Horne, 1992). Concentrating resources on the service-related activities at a strategic level, lodging firms, especially those with greater service complexity, could benefit considerably from ALBM. This could be accomplished by investing in systems and processes that support continuous development and improvement of services via effective communication and engagement with customers, such as data analytics, artificial intelligence, and Internet of Things (Song et al., 2009).

Second, recognizing a stronger effect of ALBM on performance during economic downturns has practical implications. Due to the cyclical nature of tourism demand, the impact of economic slowdown is particularly significant for businesses within the tourism and hospitality industry (Chen, 2011; Lee, Singal, & Kang, 2013). Findings suggest lodging firms embracing ALBM will likely reduce the negative impact of external turbulence compared to more asset-intensive competitors. Therefore, it is clear that a key strategy for lodging firm managers is to adjust the degree to which ALBM is implemented to achieve optimal performance while efficiently minimizing the influence of slow economic growth. Furthermore, our findings serve to direct investors interested in the tourism and hospitality industry. Although economic downturns systematically affect all businesses, investors can effectively scale back the risk of their portfolios by increasing their investment in highly asset-light lodging firms. Such an effort, combined with traditional risk management strategies (e.g., diversification), can decrease a portfolio's exposure to market volatility during economic turmoil (Geroski & Gregg, 1997; Latham & Braun, 2011).

Finally, in light of the COVID-19 pandemic, our findings related to risk management are particularly important for lodging firm managers. As many countries have implemented travel restrictions, this epidemic has taken a heavy toll on the tourism and hospitality industries. According to the American Hotel & Lodging Association, COVID-19 has caused drops of approximately 80-90 percent in hotel occupancy with a sales loss of $215.5 billion (AHLA, 2020). Despite various economic recovery measures being in place, lodging firms may continue to bear substantial losses in sales and revenues as a result of disruptions in tourism supply and demand. This unprecedented crisis, therefore, calls for a novel risk management strategy that allows them to reshape and reconfigure existing resources to mitigate the impact of COVID-19.

The findings of our study provide some insights into more efficient risk management to cope with economic slowdowns.

5.3. Limitations and suggestions for future research

This study is not without its limitations. First, our findings may not be generalizable as the sample of this study is comprised of publicly traded lodging firms in the U.S. As the effects of DC are contingent on external environments, future research could expand the current study by analyzing various types of tourism and hospitality organizations across different geographic locations. Second, the scope of our analysis is relatively limited due to restricted data availability. As much of our data were extracted manually from quarterly and annual reports, a fairly large amount of data were unavailable, primarily because lodging firms began to report specific asset- and performance-related data in the late 1990s. Future research can improve on this study by adopting a survey research design to better reflect managerial perspectives towards DC and their impacts on performance (Lin & Wu, 2014; Schilke, 2014).

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