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Competition and competitiveness in the US airline industry

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Abstract

Purpose – This study aims to employ a resource-based lens to explore the competitive implications of firm strategies under conditions of market commonality and shared resource pools.

Design/methodology/approach – The firms' core capabilities in these environments may focus on operational efficiency, as firms seek to compete under significant resource heterogeneity constraints.

Findings – Using data from the USA airline industry from 1996-2011, we find that price has a positive relationship with firm performance, whereas quality has a negative relationship. Operational efficiency is a driver of both strategies.

Research limitations/implications – The study uses US data. Extending the findings to the global setting may require recognizing other competitive dimensions.

Originality/value – Firms that focus on non-core activities perform less well. The results offer insights into an industry that has interested strategy researchers for many years and may suggest an application to other industries with similar characteristics.

Keywords Operational efficiency, Airline industry, Bertrand competition

Paper type Research paper

Introduction

This business is intensely, vigorously, bitterly, savagely competitive.

—*Robert Crandall, CEO, American Airlines* (D'Aveni, 1994, p. 3).

After the US airline industry was deregulated in 1978 with the Airline Deregulation Act, price, route and scheduling controls were eliminated. The specter of potential competition, coupled with the onset of *actual* competition, brought about heterogeneity in prices and exposed industry inefficiencies (Morrison and Winston, 1987; Borenstein, 1992). However, after the external shock of deregulation, competition continued to intensify in subsequent years, and the industry began to exhibit signs of maturity once again (Walker *et al.*, 2002). The mature phase of an industry, which is predicated upon low-cost disparity, is likely to see fewer competitors, greater similarity of operations, imitation and greater reliance on routinized processes (Klepper and Graddy, 1990). It is in these environments that connection between firm strategy and performance, which exists at the core of modern strategic management research (Rumelt *et al.*, 1994), is truly tested.

The strategic management literature often suggests that maturity connotes vulnerability, as some new technology may disrupt the natural order (Christensen, 1997). However, there may be conditions that leave an industry in a relative loop: isolated from external change and endogenized to internal change. In this paper, we examine the strategic implications that come from operating in a mature, overlapping

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space: how do firms compete, and how shallow are their competitive moves? Our contribution is to suggest that the core capabilities of the firm become finely practiced as operational efficiencies, which represent the only path to positive performance. Indeed, we argue the focus on routinized processes suggested by Klepper and Graddy (1990) is amplified when mature industries are beset by common resources and markets. Not only do firms retain a narrow focus, but they are discouraged from outward activities.

The resource-based view (RBV) posits that the firm's resources and capabilities serve as the basis for sustained competitive advantage (SCA), if they are valuable, rare, inimitable and non-substitutable (VRIN) (Wernerfelt, 1984; Barney, 1991). A crucial isolating mechanism of the RBV is the scarcity and specificity of the firm's resources (Rumelt, 1984). However, what if resources are neither scarce nor specific? For instance, airlines service clearly defined, but largely similar, markets. A passenger is simply cargo to move, and from which to extract revenue. Overlaps in resources may impact the intensity of competition in an industry (Chen, 1996; Gimeno and Woo, 1996), but little is known about the foundations of firm performance in such environments. Our study attempts to bridge this divide. We ask: what drives performance when there is very little resource heterogeneity? To explore this question, we intersect the RBV with competitive dynamics literature, which suggests that the firm's resources and capabilities may influence the very nature of its competitive actions (Ndofor *et al.*, 2011).

The RBV lens sees the firm as a bundle of resources and capabilities (Peteraf and Barney, 2003); in the airline industry, this may be visualized as the operation of a complex network, rather than the piloting of an individual aircraft (Helfat and Winter, 2011). Resources may be considered tangible assets, whereas capabilities are intangible assets (Makadok, 2001). The organization's core capabilities are those that are central to the firm's primary activities (Teece *et al.*, 1997). However, in mature industries with resource and market overlap, these core capabilities may take on a constrained role for the firm. Research on capability life cycles suggests that as capabilities themselves enter a maturation stage, the firm's focus turns to efficiency (Helfat and Peteraf, 2003). Moving to the firm level, we suggest that the constrained use of core capabilities manifests itself as a focus on operational efficiency. Furthermore, the limitation of competitive actions to tactical positioning, rather than strategy formulation, may represent a "Red Queen" effect: all firms exert significant effort in achieving limited competitive gains (Derfus *et al.*, 2008; Banker *et al.*, 2013). The "Red Queen" effect, as considered in our paper, is the consequence of resource and market overlaps, limiting firm pathways to growth.

Using a sample of 14 major US airlines from 1996-2011, we assess the relationship between organizational core capabilities, and performance in a mature industry with resource and market overlap. We find that the airline industry is remarkably homogenous along the key dimensions of price, quality and passenger load factor, which are modeled to have direct effects on firm performance. This finding is consistent with some of the market-level research on the airline industry that comes from the competitive dynamics literature: markets overlap, and firms draw from common resource pools (Chen, 1996). Extending Prince and Simon (2009) to the firm level of analysis, we find that, in this industry environment, price has a positive relationship with performance, whereas quality has a negative relationship. Given this market environment, we ask:

- how do firms attempt to gain a competitive advantage; and
- can they aim to move beyond the confines of industry constraints?

Our analysis suggests that organizational efficiency positively impacts price. In other words, firms gain on the basis of efficiency alone. A discussion of the implications of the efficiency focus on industry evolution concludes our review.

Theory and hypotheses

The RBV of the firm

The RBV of the firm is one of the cornerstone theories of strategic management (Kraaijenbrink *et al.*, 2010). The RBV argues that resources that are VRIN are the foundations of SCA (Barney, 1991) and, ultimately, firm performance (Peteraf, 1993). The firm's resources may be tangible or intangible, and have some level of firm specificity that results in a degree of permanence (Wernerfelt, 1984). However, these idiosyncratic resources must be controlled by the firm (Barney, 1991; Amit and Schoemaker, 1993). Resources have been considered to include, or be equivalent to, capabilities (Barney, 1991; Peteraf, 1993). However, both must be idiosyncratic to the firm (Makadok, 2001). Internal development processes may increase the interdependency and firm specificity of resources and capabilities (Dierickx and Cool, 1989), although an inward-looking development strategy may constrain the firm (Reed and DeFillippi, 1990). Finally, capabilities are seen as bundles of firm activities. Helfat and Winter (2011) use an airline example to demonstrate this difference: they compare the activity of operating a flight to the capability of running a network of flights.

In the RBV literature, resources and capabilities are often used interchangeably (Barney, 1991). However, some have distinguished between them as separate contributors to the firm's competitive position (Makadok, 2001). In the same way that Penrose (1959) sought to separate out productive and administrative resources, the modern literature has focused on the organization's capabilities as a deployment mechanism for the broader resource portfolio of the firm (Helfat and Winter, 2011). As noted by Collis (1994), organizational capabilities may imply deployment (Amit and Schoemaker, 1993), dynamic improvement (Teece, 1994) or a straddling of the two (Henderson and Cockburn, 1994). In every case lies a complementarity between the firm's resources and capabilities (Hoopes and Madsen, 2008). The firm's SCA lies not only in the heterogeneity of resources and capabilities but also the manner in which they are used, developed and combined (Kogut and Zander, 1992). When this combination creates greater value than the sum of its parts, we expect to see complementarity (Adegbesan, 2009). Furthermore, firms may seek an optimal misalignment of capabilities in the pursuit of growth (Hamilton *et al.*, 1998). As we relate this overview of the RBV to the airline industry, in this paper, we must note that even in the presence of complementarity, the common sources and common application may render capabilities fungible across firms, despite a seemingly unique origin.

The RBV demands that to gain an SCA, the firm's resources must accede to all elements of the VRIN criteria (Barney, 1991). Although this model has been characterized as tautological (Priem and Butler, 2001), the larger challenge may lie in achieving a somewhat perfect (and impossible) portfolio of resources and capabilities (Collis, 1994). It can be argued that the competitive advantage achieved by the firm is increasingly assailable (D'Aveni, 1994; Eisenhardt and Martin, 2000), and that the firm is compelled to pursue new capabilities to remain competitively relevant. The need to adapt or develop new capabilities may connote a posture that either defend or move from a current position. What the change literature implies is that the VRIN criteria are

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unlikely to hold under competitive pressure, or that competitive advantage may be difficult to sustain. However, the core notion of the RBV has retained some veracity after nearly four decades of scrutiny (Kraaijenbrink *et al.*, 2010). Although the notion of SCA may be a mirage to some, the core tenets of the VRIN framework remain a viable competitive goal for the firm. The challenge for RBV scholars, then, is to integrate related theories to gain a more holistic view of how the firm successfully competes. One way is to incorporate competitive dynamics into the discussion. We seek to integrate the RBV and competitive dynamics literature as a means to reconcile what we observe in the airline industry: firms compete assiduously and develop complex capabilities, but the business environment may be such that competition is incentivized to pursue a common path.

Competitive dynamics, market commonality and resource similarity

> […] every airline knows almost instantly, to the penny, what every competing airline is charging for every kind of ticket on every route, and what those fares will be in the next few hours (Gerchick, 2013).

The competitive dynamics literature considers the series of moves and countermoves that establish competitive advantage (Smith *et al.*, 1991; Smith *et al.*, 2001). In other words, the competitive moves of the firm may represent the embodiment of capability deployment. Firm traits are likely to explain the nature and timing of competitive moves (Smith *et al.*, 2001), and strategy formulation is seen as a sequence of competitive moves (Ferrier, 2001). Scholars examine not only action and response dynamics but also outcomes that describe the competitive position of each firm. This research has become more granular over time. Scholars of competitive dynamics have moved from an early and broad conception of industry-level rivalry (Porter, 1980) to a cognition-based group definition of who the firm's competitors are (Porac *et al.*, 1995) to the narrow dyadic conceptions of competitor acumen and the anticipation of a rival's moves (Tsai *et al.*, 2011).

An important line of thought in the competitive dynamic literature is the basis on which firms choose to move or respond in multiple markets of engagement. Multimarket contact refers to the simultaneous competition by firms in multiple markets (Karnani and Wernerfelt, 1985)[1]. Firms that compete directly in multiple markets may have different incentives to act than those that interface on a less direct basis (Baum and Korn, 1996). Indeed, a firm may adopt a position of mutual forbearance in one market if it anticipates retaliation in other *shared* markets (Edwards, 1955; Evans and Kessides, 1994; Gimeno and Woo, 1996). If markets are well-defined and competitors known, firms may take on different postures and roles (Chen *et al.*, 2010). Conversely, firms may engage in "Red Queen" competition: an ongoing race of competitive actions by firms that results in making little progress relative to their rivals (Derfus *et al.*, 2008). This paper argues that the overlap of markets and strongholds in some (i.e. airline hubs) leads to a unique dynamic, whereby all competition is direct and simultaneous.

The notion of similarity has emerged as a key plank of competitive dynamics research. For instance, strategic similarity between firms may increase the intensity of rivalry, whereas multimarket contact may de-escalate competitive actions (Gimeno and Woo, 1996). Firms may draw on similar resource endowments and compete for the same customers (Chen, 1996), and that overlap may induce some measure of imitation

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(Gimeno and Woo, 1996). However, imitation must have a purpose: Drnevich and Kriauciunas (2011) observed similarity of capabilities owing to the emergence of isomorphism, or "best practices" (DiMaggio and Powell, 1983). The isomorphic pressures that drive capability similarity may be a crucial component of the firm's decision-making. This result yields an interesting conundrum, as it relates to the RBV: in competitive environments that overlap and create isomorphic pressures, can firms create heterogeneous resources and capabilities? Taken together, the competitive dynamics and RBV literatures may yield greater insights into this question. Indeed, some of the issues that arise from the competitive dynamics literature may suggest that fungibility of resources and capabilities is enabled by the nature of how firms engage each other.

Competitive dynamics and the RBV

The intersection of the RBV and the competitive dynamics literatures is a theoretically rich space, although it is underexplored (Ndofor *et al.*, 2011). The RBV argues that the resources of the firm that are both rare and idiosyncratic are the foundation of competitive advantage (Wernerfelt, 1984; Barney, 1991). On the other hand, competitive dynamics is complementary field to the RBV: it argues that the firm's resources *enable* competitive moves (Smith *et al.*, 2001). However, only recently have scholars begun to consider *how* resources and capabilities serve as the basis of competitive dynamics (Ndofor *et al.*, 2011).

The heterogeneity of resource markets and the managerial discretion used to deploy resources have long been foundational assumptions of the RBV (Amit and Schoemaker, 1993). The firm achieves rents by making unique use of its resources (Mahoney and Pandia, 1992). However, the firm may be limited in its ability to recombine resources in novel ways (Kogut and Zander, 1992) if there is little heterogeneity of resources. Similarly, resources that are fungible across firms lack strategic importance (Makadok and Barney, 2001) and, most certainly, lack causal ambiguity (Dierickx and Cool, 1989). Therefore, strategic resources are crucial to the competitive moves of the firm. In fact, Ndofor *et al.* (2011) suggest that competitive moves that rely on the firm's strategic resources are the ones that lead to performance advantages. Yet, how do these resources and capabilities end up with a high level of fungibility? Surely, intense levels of competition yield *some* measure of innovation, as Porter (1980) suggests. To end up with the "Red Queen" effect (Derfus *et al.*, 2008), there must be an enabling mechanism. We argue that the properties of the competition draw firms closer to their core activities and, thus, tied more closely to each other.

Although the competitive dynamics literature suggests that resources are an antecedent to competitive actions, it also notes that an overlap in markets and resources is likely to see firms compete in the same way. Therefore, the similarity of resource markets may result in similar competitive actions (Fiegenbaum and Thomas, 1995). A lack of resource and capability breadth is likely to result in the firm conforming to isomorphic pressures (DiMaggio and Powell, 1983) and having a greater dependency on partners (Miller and Chen, 1994; Ndofor *et al.*, 2011). The isomorphic pressures that draw firms together suggest a limited competitive flexibility for the firm (Ndofor *et al.*, 2011). The greater the number of resources that are similar across firms, the fewer dimensions upon which they can effectively compete (Scherer and Ross, 1990). Furthermore, the focus on a fungible set of resources implies a shift from the *strategic* to the *tactical*: firms thus continue to compete and yet find themselves no further ahead of their rivals (Derfus *et al.*, 2008; Banker *et al.*, 2013).

We believe that isomorphic pressures stemming from common resources are likely to lead to limitations in firm competitive actions. We argue that the similarity of resource factors and market commonality (Chen, 1996) creates a narrow portfolio of actions from which firms can seek performance advantages. This is the boundary condition of our study: we examine the drivers of performance in competitive environments that, by virtue of their shared competitive spaces and common resources, shape capabilities and their associated inability to resist isomorphic pressures. If competitive advantage comes from relative, rather than absolute, resource endowments and capability sets (Sirmon *et al.*, 2010), we suggest that there may be narrow capabilities upon which firms compete in overlapping environments. Consistent with the competitive dynamics literature, a more narrow range of capabilities and resources must enable competitive moves (Ndofor *et al.*, 2011). Exploring the intersection of the RBV and competitive dynamics literatures, we have developed a model to examine which competitive strategies drive performance and how core operational capabilities improve firm performance.

Price and quality

> "[…] no airline can bear to have its fares "out of line" with the competition for long; travelers buy tickets – and choose airlines – based, first and foremost, on what's cheapest" (Gerchick, 2013).

Porter (1980) refers to differentiation and cost leadership as the key strategic choices of the firm. This is a particularly interesting basis from which to draw in the competitive dynamics literature. How do these strategies apply when markets and resources overlap? Price and quality may represent the embodiment of Porter's (1980) strategies, and there is ample evidence of what happens to price and quality when firms operate in overlapping spaces.

Firms in multimarket competition will engage in mutual forbearance (Edwards, 1955), and the extent to which resources are shared between overlapping markets will exacerbate the diminution of competitive intensity (Gimeno and Woo, 1996). However, firms that share numerous routes are likely to charge higher prices (Gimeno and Woo, 1996). As the demonstrative quote above shows, airlines operate with *full* pricing transparency, despite operating complex networks with numerous permutations of class, booking window and other segmentation variables. Not only do firms overlap in similar spaces, but there is an ability to *project* future moves.

Numerous studies have examined the positive relationship between multimarket competition and price-cost margin (Feinberg, 1985; Hughes and Oughton, 1993; Yu and Canella Jr., 2013). Multimarket contact will influence the nature of repetitive competitive actions (Jayachandran *et al.*, 1999), such as those of product quality and price decisions. Product quality may suffer in multimarket environments, as the marginal gains to *all* firms must exceed the aggregate marginal cost (Prince and Simon, 2009). In other words, quality is easily imitated, and the gains must extend beyond the individual market. On the other hand, price results from the entrenched positions across numerous markets. The scale economies that can emerge from multimarket contact may create "spheres of influence", which allow firms to maintain higher levels of pricing (Bernheim and Whinston, 1990).

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In this paper, we present two sets of hypotheses. The first serves to verify the effect of our boundary conditions: that is to say, if overlapping markets and resource commonalities exist, do they indeed lead to specific price and quality incentives? We posit that higher prices stemming from scale economies and overlap, coupled with the low marginal gains to quality, thus framing our first hypotheses:

H1a. In mature competitive environments characterized by resource similarities and market commonality, the quality of the firm's core offering will negatively affect performance.

H1b. In mature competitive environments characterized by resource similarities and market commonality, the price of the firm's core offering will positively affect performance.

Operational capabilities

> Fares alone weren't enough, though. Air travel is largely a commodity – like a pound of sugar or a gallon of gas. Raise the price (or basic fare) too much and buyers turn elsewhere – to a competitor that starts service on the overpriced route or that offers to save a bundle for fliers willing to take an indirect connecting flight. So how do you make money in the airline business if you can't charge more for your product – a flight? (Gerchick, 2013)

The above-stated hypotheses build on the extant literature to suggest that the resource underpinnings of firms in overlapping environments result in higher prices without a need for a corresponding increase in quality. Under this model, firms face little choice with respect to Porter's (1980) strategies of cost leadership or product differentiation. If quality represents differentiation, then there may be disincentives to stand out from the competition. On the other hand, price, which is a product of market structure, may be inflated under the specter of truly damaging price war. Thus, the creation of margin may come from cost leadership. In other words, in an industry with overlapping market positions and shared resource pools, the way in which firms compete will depend on how they operate with the *same* tools. As noted by Jacobides *et al.* (2012), common resources may take on idiosyncratic roles through transformation. However, this is contingent on manageable customization costs (Jacobides *et al.*, 2012). In industries with resources that are inherently non-customizable, such as fuel, and others that are expensive to customize significantly for the benefits of cost leadership, such as aircraft, operational efficiency may be the resulting sole, salient point of the firm's competitive efforts.

Operational efficiency stems from the firm's core activities, which reflect the ability of the firm to operate within its area of expertise, while developing and honing key resources. Core capabilities represent the collective learning in an organization (Prahalad and Hamel, 1990) and define its fundamental business (Teece *et al.*, 1997). They reflect the firm's ability to compete within its area of expertise (Prahalad and Hamel, 1990) and often lead to some level of causal ambiguity in the competitive environment (Lippman and Rummelt, 1982). This is a function of tacitness (Polanyi, 1966), complexity (Nelson and Winter, 1982) and specificity (Williamson, 1985). Causal ambiguity limits the ability of firms to copy others and, therefore, erects barriers to imitation (Reed and Defillippi, 1990). Organizational capabilities are the collection of high-level routines that enable the firm to carry out business-critical activities (Winter, 2000; Helfat and Peteraf, 2003). In other words, organizational capabilities reflect a

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purely exploitative posture (March, 1991), and coordinative in nature (Helfat and Peteraf, 2003).

As the firm moves further down the experience curve with largely established processes, the gains to learning are greatly diminished over time (Porter, 1980; Lieberman, 1987; Hill, 1988). The lack of competitive deviance and complexity (Ndofor *et al.*, 2011) reduces firm specificity of these resources and associated operational capabilities. Operational capabilities are those employed by the firm to maintain a current competitive position (Winter, 2003; Helfat and Winter, 2011). These "first order" capabilities (Collis, 1994) reflect an existing competitive state, rather than some change or transformation in the firm's strategic focus. In other words, an industry in which strategic similarity limits deviance and complexity may rely on operational capabilities as a performance driving mechanism. It then follows that non-core activities represent an arena where the core firm resources and capabilities are not as well-developed or as relevant. This strategic resource similarity and dissimilarity suggests our second group of hypotheses:

H2a. In mature competitive environments characterized by a resource similarities and market commonality, organizational capabilities will positively affect performance.

H2b. In mature competitive environments characterized by a resource similarities and market commonality, non-core capabilities will negatively affect performance.

Methods and data

Empirical setting: the US airline industry

> Stress has become part of the whole air-travel experience. It's no surprise then that airlines in 2011 ranked last out of 47 USA industries in the University of Michigan's annual American Customer Satisfaction Index. (Gerchick, 2013)

The US airline industry has long been considered as one of intense competition, with few success stories. Firms rarely, if ever, retain competitive advantages. Consider American Airlines:

- it was the first airline to offer a loyalty program;
- the first to introduce computerized reservations systems; and
- the first to offer a series of other innovations in the market (D'Aveni, 1994).

In every case, American's competitors caught up and imitated the innovations in some way. In November 2011, American filed for bankruptcy protection, citing fuel and labor costs as driving an unsustainable business model[2]. For airlines, the competitive landscape is challenging, and success is fleeting.

The airline industry, which was mature at the point of deregulation in 1978, saw an initial period of uncertain performance for incumbents before reestablishing a measure of stability some ten years later (Walker *et al.*, 2002). Incumbent firms resorted to marketing efforts, such as loyalty programs, to gain customers and raise switching costs, but most industry players copied such moves (Borenstein, 1989). Airlines remained under a significant regulatory burden (Winston, 1993) and had to conform to broader industry standards, such as airport procedures and crew-to-passenger ratios. In

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the USA, airlines must hew to the ongoing concerns of the Department of Transportation and the Federal Aviation Administration (FAA), which govern commercial and safety issues, respectively (Gerchick, 2013). To this end, the adoption of the hub and spoke route system may have generated efficiencies, but the resulting stability limited the flexibility of firms to make significant changes to service markets (Walker *et al.*, 2002). The combination of regulations (FAA), external standards (airports, booking systems), shared resource pools (aircraft, fuel, labor) and markets (city pairs, fare classes) leave airlines with very little room to maneuver. Many of the above-mentioned constraints are commonly applied to firms, and suppliers have significant power (Porter, 1980). In other words, firms face roughly the same costs. For instance, consider fuel. Jet A fuel is traded on public markets, and firms can engage in price hedging strategies. However much this may create cost advantages, firms remain price takers. Therefore, constraints on actions are externally and uniformly imposed.

Airlines draw from shared resource pools (Chen, 1996). Our data illustrates this point rather dramatically. Table I shows the average operational expenses for firms in the airline industry at the time junctures of 1997, 2004 and 2010. While some line items become significantly more expensive over time, such as fuel, others are rather stable. Across firms, these figures are remarkably stable as well. For instance, although labor costs make up roughly 30 per cent of operating expenses from year to year, the standard deviation across firms is approximately 5.00. Furthermore, it can be seen that few of the operational expenses incurred by airlines are controllable. That is to say, airlines have little power over their suppliers and are price takers (Porter, 1980). Fuel, aircraft and labor are commodities that pose significant costs for airlines and are fungible across firms.

The competitive dynamics literature has studied the airline industry extensively, with particular attention paid to market dyads. Chen (1996) found that market commonality, which combines relative importance and market share in key markets, reached levels of 0.30 for major airlines. More recent data on the airline industry show a mean Herfindahl–Hirschman Index (HHI) of 0.65 at the *route* level in the USA (Prince and Simon, 2009), suggesting a high degree of market commonality. In the airline industry, maintaining a network of flights represents a crucial core capability (Helfat and Winter, 2011). With a delineated market boundary of independently run airports in the USA, airlines have a natural coverage incentive that sees competition inevitably emerge at the network level.

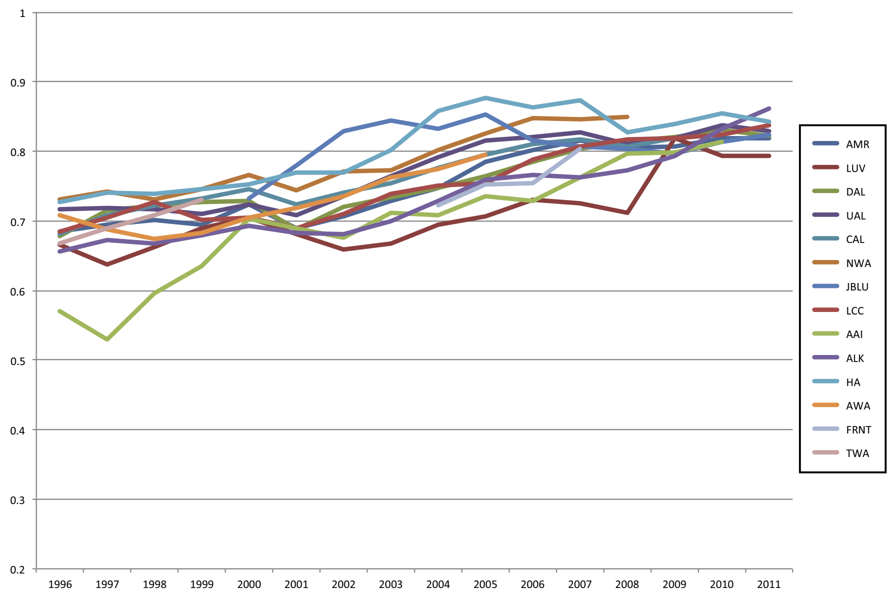
Table I. Mean airline operating expenses (% of total operating expenses)

Variable	1997	2004	2010
Wages and salaries (partially fixed)	31.97	29.39	26.51
Fuel and oil (partially fixed)	13.69	18.69	30.15
Commissions to agents (variable)	7.83	4.86	4.31
Depreciation and amortization (fixed)	4.71	4.89	4.94
Other rentals and landing fees (mostly fixed)	5.68	6.25	6.22
Maintenance and repairs (fixed)	6.39	6.06	6.33
Aircraft rentals (for leased vs owned aircraft) (fixed)	8.56	6.54	4.08
Other operating expenses (mostly fixed)	20.98	23.10	16.86
Restructuring costs (fixed)	0.18	0.24	0.60
Total	100	100	100

The consequences of shared resource pools and overlapping markets in the airline industry become clear when examining the variability in operational outcomes. Figures 1-3 demonstrate how closely airlines operate in terms of load factor, product quality and pricing. Starting in 1996, most airlines operated within a close range of a 70 per cent load factor. Most firms were operating at just over 80 per cent by 2011. Similarly, most airlines were on time 80 per cent of the time in 1996, an outcome repeated in 2011. Finally, while the majority of airlines captured a yield per revenue seat mile of 8 cents in 1997, this figure reached roughly 10 cents in 2010. In all three figures, it can be seen that the variability in operational metrics occurs over time, but rarely between firms.

Data and measures

Our data consist of all "major" firms in the airline industry over the period of 1996-2011. The US Bureau of Transportation Statistics (BTS) defines an airline as being major if it posts annual operative revenue of greater than US$1 billion[3]. To this end, our dataset captures the complete population of major US airlines. Over the sample period, firms either enter (i.e. JetBlue Airways) or exit via acquisition (i.e. Northwest Airlines). Therefore, our data are presented as an unbalanced panel set. Our primary data sources were annual reports and COMPUSTAT, which contain financial and operational data. These sources were supplemented by the US BTS for additional operational data, such as on-time performance. As the USA also reports financial data, we were able to



Notes: Airline codes: AMR = American Airlines; LUV = Southwest Airlines; DAL = Delta Airlines; CAL = Air California; NWA = Northwest; JBLU = Jet Blue; LCC = The Lancair Company; AAI = Air Aurora; ALK = Alaska Airlines; HA = Hawaiian Airlines; AWA = America West Airlines; FRNT = Frontier Airlines; TWA = Trans World Airlines

Figure 1.
The US airline industry, 1996-2011: load factor (%)

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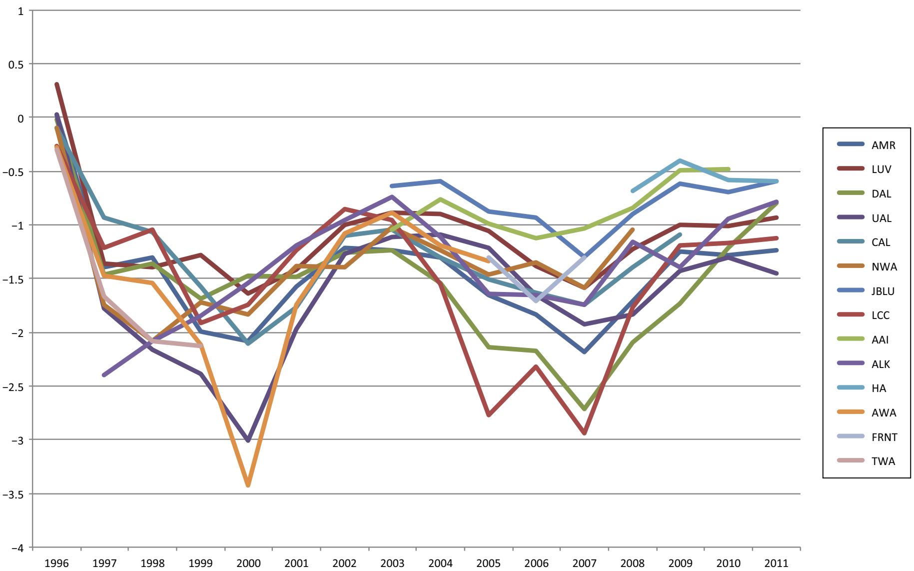

Figure 2.
The US airline industry, 1996-2011: Airline Quality Index

Notes: Airline codes: AMR = American Airlines; LUV = Southwest Airlines; DAL = Delta Airlines; CAL = Air California; NWA = Northwest; JBLU = Jet Blue; LCC = The Lancair Company; AAI = Air Aurora; ALK = Alaska Airlines; HA = Hawaiian Airlines; AWA = America West Airlines; FRNT = Frontier Airlines; TWA = Trans World Airlines

corroborate sources. Table II reports the summary statistics and variable definitions for all measures used in this study.

Our dependent variable is firm performance, which we operationalize as stock price. The firm is likely to set goals that are in line with those of external stakeholders (Audia and Greve, 2006). Stock prices contain information on both current and expected performance. Investors will update expectations based on current performance, and this will reflect in ongoing market price adjustments (Patell, 1976; Lee *et al.*, 2012). We chose stock price over other more commonly used performance metrics such as return on assets or net income for three reasons. First, the extent to which firms lack control over strategic moves in this industry, stock price will include an amplified market assessment of a firm's decision-making. Second, the extent to which firm rely on external suppliers, such as fuel and aircraft, may create undue bias in metrics such as assets. For instance, some airlines lease aircraft, whereas others own them outright. Similarly, most firms purchase fuel price hedging contracts and commit to future prices to avoid undue market movement. How this is dealt with on an accounting basis may be impacted by the largest potential assets of the firm (Walker *et al.*, 2002). Third, the airline industry loses money on a consistent basis. Indeed, the mean net income in our sample is *negative*. Economic theory would suggest that the persistence of such negative performance would lead firms to drop out; while some firms are acquired in our sample and many enter into bankruptcy protection, none fail. Therefore, a performance measure with a longer time horizon is needed.

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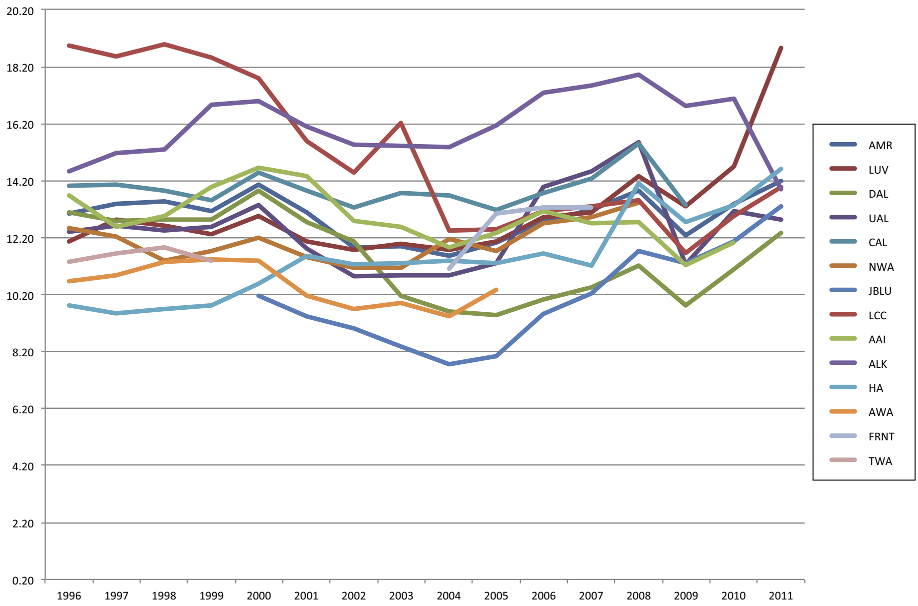

Notes: Airline codes: AMR = American Airlines; LUV = Southwest Airlines; DAL = Delta Airlines; CAL = Air California; NWA = Northwest; JBLU = Jet Blue; LCC = The Lancair Company; AAI = Air Aurora; ALK = Alaska Airlines; HA = Hawaiian Airlines; AWA = America West Airlines; FRNT = Frontier Airlines; TWA = Trans World Airlines

Figure 3. The US airline industry, 1996-2011: revenue passenger mile yield (cents)

Variable	Definition	Mean	SD
Stock price	Stock price at year end ($)	18.85	17.33
RevASM	Revenue yield per available seat mile (cents)	12.80	2.13
Quality_AQR	Airline Quality Index	−1.34	0.60
LoadFactor	Load factor (capacity utilization %)	0.75	0.062
Debt to equity	Debt to equity ratio	4.09	23.21
Ad/Sales	Advertising expense to sales (revenue) ratio	0.012	0.012
CurrentRatio	Current ratio (current assets/current liabilities)	0.91	0.32
Firm size	Firm size, by employees (thousands)	35.61	31.09
Net income	Net income (US$ millions)	−255.42	2,666.91
GDPLag	US GDP, adjusted for inflation (US$ billions, 2005 = 100), lagged t-1	11,722.42	1,212.56
HHI	HHI	0.14	0.026
OutsourcedRegional	Regional operations outsourced (1 = yes, 0 = no)	0.53	0.50
OtherRevPercent	Percent of non-passenger revenue	0.11	0.25

Table II. Variable definitions and summary statistics

Crucial to the operation of an airline in this market are cost efficiency, reliability, responsiveness and speed of delivery (Schefcyzk, 1993). Operational capabilities are fundamental to a firm's existence (Teece *et al.*, 1997), and this holds especially true in the airline industry. Passenger load factor, or capacity utilization, is an often-used indicator

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of productivity in the airline industry (Schefcyzk, 1993). Load factor reflects strategic choice with respect to the multitude of factors see an airline's capacity filled (Ramaswamy *et al.*, 1994). Therefore, we operationalize the organizational capabilities of the firm as *passenger load factor*, or the percentage of available seat miles (capacity) that is filled by revenue passenger miles. *Non-core activities* are operationalized as the percentage of revenue that does not come from passengers.

The *revenue yield per revenue passenger miles* represents an airline's realized price across all segments and markets. In our hypothesized model, what a firm is able to achieve in price is a product of that firm's operational efficiency. Price as a function of capacity, therefore, considers both the extent to which a firm can manage its supply and demand dynamic within an overlapping space. To capture quality, our study uses the *Airline Quality Rating* (AQR), an annual study by scholars at Purdue University and Wichita State University. The AQR uses the measures of on-time performance, denied boardings, mishandled baggage and customer complaints to create an index of airline quality (Bowen and Headley, 2013). The data behind this index are from the US BTS and are aggregated annually across all scheduled flights by carrier.

We include a series of firm-level and industry-level controls for this study. *Current ratio* is included to represent organizational slack, which may enable a greater number of competitive moves (Young *et al.*, 1996). *Firm size* is an important control to capture the effect of economies of scale. As the airline industry continues to consolidate, scale synergy and size may be relevant drivers of performance. This is measured by capturing the number of employees per airline in a given year. Regional traffic also feeds into the domestic system. To this extent, airlines that conduct their own *regional operations* may face different efficiency constraints than those that outsource the activity. The US gross domestic product (GDP) is included as a control in our model to account for the effect of business cycles. As GDP is generally considered to be a lagging variable with respect to stock price (Estrella and Mishkin, 1998), we have lagged it as a control in that context. *Ad-sales ratio* represents the advertising to sales ratio, or the attempts to communicate points of differentiation to consumers. One industry-level control has been included in our analysis: *HHI*. The relative concentration of the industry is important in determining both performance and the degree of overlap between firms. Given the highly routinized activities within the airline industry, major projects, which are a signal to the market of a firm's strategic intentions, require a substantial influx of capital. Such moves may be captured by the *debt to equity ratio* of the firm, a valuable control.

Results

For this study, we have estimated a random effects generalized least squares (GLS) regression on our unbalanced panel data. Initially, we estimated the model(s) using ordinary least squares (OLS) and random effects GLS regressions, but we ran a Hausman test to explore the difference in using fixed-effects and random-effects regressions. The test indicated a statistically insignificant result, suggesting that the random effects model was most appropriate. This is consistent with the goals of our model, which are rooted in within firm analysis. Finally, we have used robust standard errors in our analysis. Given the small size of the dataset, clustered standard errors may be overly optimistic (Driscoll and Kraay, 1998). The results of three above-mentioned regressions can be found in Table III, and test the relationship between price, quality, load factor and non-core activities against firm performance. Model specification 3 in Table III represents our final model. Table IV examines the series of base models leading to our final estimation.

Our first set of hypothesis sought to examine the price/quality dynamic with respect to performance, under the weight of resource similarity and market commonality. As we

Estimation method	(1) OLS	(2) FE (GLS)	(3) RE (GLS)
DV (stock price)			
RevRPM	2.79** (5.48)	2.30* (2.66)	2.52** (2.82)
AQR	−7.89** (−3.61)	−6.86** (−3.06)	−7.01** (−3.65)
Load factor	133.01** (4.01)	165.08* (2.48)	155.03** (2.65)
Debt to equity	−0.0239*** (−2.09)	−0.0223**** (−2.10)	−0.0183* (−2.44)
Non-passenger revenue share	−0.0011*** (−1.86)	−0.0016* (−2.88)	−0.0016** (−4.02)
Firm size	0.2855** (5.52)	0.4485** (6.37)	0.3808** (6.11)
Ad sales ratio	−376.21* (−2.02)	−291.17 (−0.55)	−209.10 (−0.64)
Outsourced regional ops	−10.45** (−2.85)	−8.45*** (−0.87)	−10.67*** (−1.77)
Current ratio	10.09** (2.84)	6.92* (2.46)	7.93** (2.56)
Net income	0.0011** (4.44)	0.0011** (5.39)	0.0011** (5.66)
GDP (Lag)	0.0099** (−8.23)	−0.0111** (−3.47)	−0.0103** (−4.32)
HHI	27.44 (0.78)	23.11*** (1.79)	19.07*** (1.85)
Constant	−22.74 (−1.09)	−10.45 (−0.60)	−32.04 (−0.84)
N	170	170	170
F/Wald χ^2	25.69**	3102.94**	8653.30**
R^2	0.6675	0.6546	0.6424

Notes: ***$p < 0.10$; *$p < 0.05$; **$p < 0.01$; all two-tailed

Table III. Results of panel regression analysis: performance

Estimation method	(4) RE (GLS)	(5) RE (GLS)	(6) RE (GLS)	(7) RE (GLS)
DV (stock price)				
RevRPM			2.91** (3.71)	3.22** (3.92)
AQR			−4.54*** (1.87)	−5.80* (−2.41)
Load factor				126.94* (2.47)
Debt to equity ratio				−0.0284* (−2.76)
Ad sales ratio		−443.94* (−2.33)	−131.14 (−0.48)	72.38 (0.27)
Current ratio		8.95** (2.64)	9.88* (1.96)	9.89* (1.99)
Firm size		0.2542** (4.32)	0.2416** (4.67)	0.2598** (6.46)
Net income	0.0017** (4.97)	0.0016** (4.60)	0.0014** (4.57)	0.0013** (4.20)
GDP (Lag)	−0.0055** (−2.94)	−0.0064** (−3.57)	−0.0065** (−4.57)	−0.0106** (−4.18)
HHI	13.28 (1.45)	15.84*** (1.86)	30.17*** (1.93)	33.91** (3.11)
Constant	79.33** (3.40)	79.54** (3.60)	32.07*** (1.68)	−25.30 (−0.84)
N	170	170	170	170
F/Wald χ^2	50.84**	569.50**	1353.716**	1841.44**
R^2	0.2073	0.4354	0.5623	0.5940

Notes: ***$p < 0.10$; *$p < 0.05$; **$p < 0.01$; all two-tailed

Table IV. Results of panel regression analysis: basic model

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had theorized, the resulting competitive dynamics in these environments would see price positively impact performance, whereas quality has a negative effect. This result should be consistent with Prince and Simon (2009), who also examine the airline industry, albeit at the city pair unit of analysis. Our results indicate a positive and significant relationship between revenue yield per revenue passenger mile and stock price, and a negative and significant relationship with respect to quality. These results suggest that efforts on the part of airlines to achieve higher price yields may lead to a higher stock price and greater approval from the market. Conversely, the pursuit of quality appears to be a fool's errand: the greater the quality, the *lower* the stock price. Thus, *H1a* and *H1b* are supported. Of particular note is the positive relationship between firm size and performance. In the context of operational efficiency, scale presents an attractive strategy to firms that may explain ongoing waves of consolidation.

Our second set of hypotheses considered the relationship between organizational capabilities and performance. We argued that operational efficiency as a core capability was the result of three factors:

(1) maturity, or a progression down the experience curve;

(2) resource similarity; and

(3) market commonality.

What this boundary condition suggests is that a narrowly defined conceptualization of organizational capabilities would remain and ultimately contribute to the firm's core offering. In our study, this variable was operationalized as the airline's load factor, or the extent to which the firm manages and fills its capacity. The results of this model, displayed in Table III, seem to confirm some of our prior belief. Load factor has a positive and significant relationship with performance, thus lending support to *H2a*. Similarly, the pursuit of non-core activities points to a negative relationship with performance. This relationship is statistically significant, supporting *H2b*.

Discussion and conclusion

This study contributes to the RBV and competitive dynamics literature by examining the role of organizational capabilities and non-core activities under the boundary conditions of market commonality and resource similarity. Using data from the US airline industry from 1996-2011, we find that organizational capabilities have a positive relationship with performance. Subsequently, non-core activities have a negative relationship with performance. Reflecting the nature of the overlapping markets and resource commonalities, price has a positive relationship with performance, whereas quality has a negative relationship. This seemingly counterintuitive finding is consistent with the competitive dynamics literature (Prince and Simon, 2009) and reflects the isomorphic forces that limit the strategic moves available to the firm. Taken together, our findings present a powerful story to the overall RBV literature: in mature industries with common resources, there may be significant limitations to how firms can compete. The apparent divide between strategies is amply illustrated in the Ryanair and Aer Lingus cases crafted by Kangis and O'Reilly (2003): Ryanair has a clear mission statement, with a profit motive underwritten by cost efficiencies. Aer Lingus, on the other hand, presents a sprawling mission statement relating to service quality, safety

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and Irish Government charters. Ryanair has since proven to be the far more successful of the two Irish carriers. It is currently seeking permission to buy Aer Lingus.

The focus on operational efficiencies may have an important long-term implication for firms in mature, overlapping industries. Eventually, competition becomes hard to sustain at the bottom of the learning curve. Indeed, the retrenchment of a capability may create reduced value for the firm over time (Helfat and Peteraf, 2003). By this, we suggest that there is, by definition, an asymptotic limit to the gains from operational efficiency. For instance, the mean value of the load factor variable in our sample is 0.75. In the later years of the sample, that number is above 0.80 (Figure 1). The upper limit to this variable is 1, and the marginal effort to reach that point is likely to be increasing in difficulty, as firms run into X-efficiency type constraints (Leibenstein, 1966). Therefore, a focus on simple execution may imply a tightening of industry concentration in future years. Firms focus on tactical moves, eschewing the complexities of strategy formulation, representing a "Red Queen" effect (Derfus *et al.*, 2008; Banker *et al.*, 2013). However, as the load factor example notes, there is a limit to how far tactical moves can be a sustainable set of competitive actions.

A key implication of our study is that the single-minded focus on core capabilities runs the risk of inertia and the development of core rigidities (Leonard-Barton, 1992). Should the type of industry that we discuss in this paper face a significant exogenous shock, the abilities on the part of incumbent firms to respond may be severely constrained, in part by the cognitive limitation of managers tied to existing routines (Tripsas and Gavetti, 2000). Furthermore, the more narrowly a firm focuses on existing capabilities, the greater the obstacles to adaptation (Peteraf, 1993). While seemingly new business models, such as the low-cost carrier, have caused incumbents to temporarily lose market share, our data show a stable industry. Disruptive firms, such as Southwest Airlines, still retain market shares of 10-12 per cent. To this end, the industry remains intensely competitive. However, the reliance on external suppliers for innovation (i.e. Boeing, Airbus) and focus on internal efficiency may result in significant industry-wide inertia.

The international context

An intriguing avenue for further research arises from broadening our focus beyond the confines of a single-country study. All airlines within the US domestic market compete under a single institutional umbrella. They may even be said to belong to one strategic group, competing along a single set of strategic dimensions (Newman, 1978; Fiegenbaum and Thomas, 1995). However, most of these US airlines also compete in the global airline industry within which there is considerably more diversity, both in terms of institutional regimes and routes. Many countries have official flag-carrying airlines, often owned by the government. Further, the global airline industry also offers a wider range of distances ranging from long-haul routes of up to 16 hours to short-haul routes of 1 hour or even less. This diversity of competitive settings may provide airlines with the opportunity to compete on quality as well as cost efficiency.

It is possible to conjecture that studying the global industry may yield two strategic groups, with one competing on cost (as in our study of the US industry) and one competing on differentiation based on brand-based intangibles (Mudambi, 2008). Airlines is this group, garner the lion's share of their profits from differentiated services like first and business class cabins, whose value is mainly realized in the long-haul

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sector. The latter strategic group may include airlines such as Singapore Airlines and British Airways that offer high quality at a high price to generate superior firm performance.

Further, in the global markets, airlines compete both as individual firms as well as members of large code-sharing alliances like the Star Alliance and One World. Each of these alliances includes a diverse range of airlines ranging from dominant players to small flag-carrying airlines, many from emerging market and developing countries. This mixture of cooperation and competition may temper some of the more stark findings that emerge from a focus on a single relatively unregulated market like the USA. The cooperative elements may include some measure of knowledge transfer from advanced economy airlines to those in emerging and developing countries and provide conduits for catch-up in terms of capabilities (Kumaraswamy *et al.*, 2012).

As with any study, this paper has limitations. First, as we have noted, we focus solely on the airline industry in the USA, which may hamper generalizability. We define our population as "major" airlines with domestic operations, but acknowledge that many of these carriers engage in competition abroad as well. It is entirely possible that in some segments of international travel, differentiation may be a successful strategy. Second, there are a limited number of firms in our sample, owing to the size of the population in the industry. Many studies in competitive dynamics that use airline industry data collect data at the city pair unit of analysis. This may allow for a more robust statistical dataset. But, we argue that they also compete in one aggregated industry: the USA. Third, although we show the extent to which this industry lacks heterogeneity across a number of measures, we acknowledge that a control industry would enhance the robustness of our boundary condition claims.

Our study represents an early examination of a potential problem in mature industries with resource overlap and market commonality. How do firms achieve competitive heterogeneity? Furthermore, is this a sustainable state of affairs? Using data from the US airline industry from 1997 to 2011, we find that price is the driving force behind performance. To this end, operational efficiency is the dominant capability for airlines, and the pursuit of non-core activities or service quality, in fact, leads to declines in performance. Also central to our findings is that firms that seek to improve their performance by increasing their non-core activities find just the opposite outcome. In summary, any effort not focused on improving the current organizational operational efficiencies will reduce corporate performance, thus reinforcing an isomorphic loop wherein firms seek to become ever more efficient, but unable to innovate.

This paper contributes to the RBV literature by asking how firms compete in the absence of resources that are truly VRIN (Barney, 1991). Is it possible that airlines are stuck in an industry in which there are no *strategic* moves that make economic sense? The focus on tactical moves may ultimately yield an industry that is unsustainable in its current form and highly susceptible to exogenous shocks.

It is somewhat fitting that the key firm discussed in this paper, American Airlines, has sought to innovate at various points in its evolution, and failed. As noted earlier, American Airlines faced bankruptcy protection in 2011. The intense rivalry in the industry both limits vision and focuses efforts, and yet, very little has changed since deregulation in 1980.

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Notes

1. For a comprehensive review of the multimarket competition literature, see Yu and Canella Jr (2013).
2. Reuters News Service. "American Airlines files for bankruptcy", Reuters News Service, available at: www.reuters.com/article/2011/11/30/us-americanairlines-idUSTRE7AS0T220111130 (accessed 4 December 2011).
3. US Bureau of Transportation Statistics: Research and Innovative Technology Administration, Carrier Snapshots, available at: www.transtats.bts.gov/carriers.asp (accessed 23 October 2011).

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