



Cure or curse: Does downsizing increase the likelihood of bankruptcy?



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ARTICLE INFO

Article history:

Received 24 June 2016

Received in revised form 10 March 2017

Accepted 10 March 2017

Available online xxxx

Keywords:

Downsizing

Bankruptcy

Organizational change

Resource-based view

Intangible resources

ABSTRACT

Downsizing is a common organizational practice, yet research on the outcomes of downsizing has produced mixed findings. To contribute to this debate, we use an organizational change perspective to investigate whether the large-scale changes inherent in downsizing set firms on a negative path that is difficult to overcome and ultimately increases the likelihood of bankruptcy. Additionally, we investigate what factors, if any, can mitigate this likelihood. To do so, we build on the resource-based view to suggest that valuable resources can reduce the likelihood that downsizing will lead to bankruptcy. We find support for our theorizing across a sample of publicly traded firms. Our findings suggest that downsizing firms are significantly more likely to declare bankruptcy than firms that do not engage in downsizing and that intangible resources help to mitigate this likelihood. We do not, however, find support for the role of physical and financial resources in preventing bankruptcy.

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1. Introduction

“To stay afloat, companies have cut costs by announcing layoffs and slashing their spending on projects.” (Gensler, 2016).

“GoPro Inc. is cutting 15% of its workforce after attempts to expand beyond its core business of action cameras failed to gain traction.” (Wells, 2016).

Statements such as these are prevalent in the business press and downsizing has become a part of the ongoing life of organizations (Jung, 2015). Irrespective of their current financial positions, firms of all types engage in employee downsizing to reduce their costs, adjust their structures, and create leaner more efficient workplaces (George, 2014; Lewin, Biemans, & Ulaga, 2010). Despite its continued and frequent use, research on downsizing continues to yield mixed results. Proponents of downsizing argue that downsizing is an effective strategy with benefits such as performance and sales increases (De Meuse & Dai, 2013; Love & Nohria, 2005; Yu & Park, 2006). Yet, other studies point to negative consequences for firms and employees, with results demonstrating that firm performance, productivity, and customer satisfaction tend to decline after downsizing (Goesaert, Heinz, & Vanormelingen, 2015; Guthrie & Datta, 2008; Lewin et al., 2010). Further, surviving employees can experience a variety of adverse effects including decreased morale, greater job insecurity, decreased creativity, and increased stress and burnout (Fisher & White, 2000; Niehoff, Moorman, Blakely, & Fuller,

2001; Probst, 2003; Probst, Stewart, Gruys, & Tierney, 2007; Rusaw, 2004; Shaw, Duffy, Johnson, & Lockhart, 2005).

These mixed findings suggest that important questions about what contributes to the viability of downsizing remain unanswered. To add to this line of inquiry we theorize that, while capable of producing positive returns, downsizing may have unintended consequences that are not fully captured in prior studies. Specifically, we build on the organizational change literature to suggest that downsizing disrupts organizations, increasing the likelihood of bankruptcy. Thus, it is essential for managers to understand what might mitigate these negative consequences and prevent their firms from declaring bankruptcy. In this study, we investigate whether firms' resources might lessen the likelihood of bankruptcy by helping firms overcome the challenges inherent in downsizing. Our study extends prior work by ascertaining whether and which types of resources help in staving off bankruptcy.

The contributions of our study lie at the intersection of the study of bankruptcy and downsizing. While both of these phenomena have been widely studied, there are few studies at the intersection of the two and there is more to be learned in each of these streams. Our literature review generated only two studies that have focused on whether downsizing is associated with subsequent bankruptcy (Powell & Yawson, 2012; Smith, 2010) and a third that briefly mentions an ad-hoc analysis of this relationship (Reynaud, 2013). Each of these studies suggests that downsizing does, indeed, increase the risk of subsequently declaring bankruptcy. We build on these studies, where the most recent year of downsizing examined was 2002, to further investigate this relationship in a sample of US firms in 2010. By comparing our results with these prior works, we are able to shed light on whether bankruptcies are

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still more likely for firms that downsize in an era when downsizing has become ingrained as an accepted practice.

Second, we take a different approach from prior studies by using the organizational change literature to theorize that the disruptive changes inherent in downsizing increase the likelihood of bankruptcy. Specifically, we suggest that this likelihood increases because downsizing interrupts organizational routines, reduces the productivity and increases the stress of remaining employees, and impedes knowledge transfer and organizational learning. By theorizing and empirically demonstrating that downsizing increases the likelihood of bankruptcy we contribute new evidence to the continuing debate surrounding the viability of downsizing.

Third, we submit that the mixed findings in the downsizing literature may be explained, in part, because large-scale changes have the potential for positive and negative outcomes and firms must find ways to counteract negative effects. Drawing on the resource-based view, we suggest that a firm's stock of resources may be one mechanism that helps to reduce the negative effects from downsizing, and therefore can help firms avoid bankruptcy. Surprisingly, extant research has just scratched the surface in delineating the role that organizational resources can play in downsizing outcomes (Brauer & Laamanen, 2014; Coucke, Pennings, & Sleuwaegen, 2007; Norman, Butler, & Ranft, 2013). For example, Norman et al., 2013 examined the role that resources play in subsequent bankruptcy, but did so with a sample that included only downsizing firms and thus could not compare downsizing firms to non-downsizing firms. Accordingly, we add to previous findings by using a sample of over 4000 firms, both downsizing and non-downsizing, to investigate the differential effects that resources have on bankruptcy and whether certain resources are particularly important for its prevention.

We also contribute to the bankruptcy literature. In assessing the likelihood of bankruptcy, both quantitative and qualitative information is useful. Yet, most prior studies have focused on quantitative data in the form of financial ratios and stock-based data because qualitative factors are more difficult to measure in an objective manner (Boratyńska, 2016). Nevertheless, recent studies have started to examine more closely the role that various qualitative factors play in the risk of bankruptcy. For example, recent studies have combined financial and market data with other “soft information,” such as legal actions, timeliness in filing financial reports, employee loyalty, and management quality (Altman, Sabato, & Wilson, 2008; Boratyńska, 2016). Our study adds to this emerging stream of by testing whether another piece of “soft information,” organizational downsizing, influences the likelihood of bankruptcy.

2. Does downsizing increase the likelihood of bankruptcy?

Downsizing involves workforce reductions undertaken with the goal, and under the economic assumption, that they will improve efficiency and performance (Datta, Guthrie, Basuil, & Pandey, 2010). While poor performance can trigger downsizing, even healthy firms downsize because the practice has, consistent with institutional theory, become legitimized as a way to enhance firm value (Jung, 2015) and “... how an organization should be structured to be effective” (McKinley, Zhao, & Rust, 2000, p. 231). Adjustments to workforce composition are increasingly accepted as a way to change existing human capital configurations and reconfigure routines (Brauer & Laamanen, 2014). Thus, at the socio-cognitive level, downsizing has become engrained as an effective schema (McKinley et al., 2000). While managers hope for positive outcomes, research examining performance outcomes of downsizing is equivocal (Datta et al., 2010; Love & Nohria, 2005) and there is some evidence that downsizing increases the risk of bankruptcy (Powell & Yawson, 2012; Smith, 2010). Indeed, some firms experience increased efficiency from downsizing (Yu & Park, 2006), while others struggle with organizational decline (Goesaert et al., 2015; Guthrie & Datta, 2008; Ndofor, Vanevenhoven, & Barker, 2013).

The organizational change literature has shown that large-scale changes can be a source of significant disruption to a firm's processes as employees face challenges to unlearn prior patterns of actions and discover and develop new routines (Miller, Pentland, & Choi, 2012). Further, these changes can introduce a host of emotional changes in remaining employees. Infrequent changes of large magnitude are especially challenging because they create incoherence or disruptions in organizational memory (Scalzo, 2006), which can lead to consequences such as deviations from established policies or procedures (Ramanujam, 2003) and the need to significantly alter routines (Brauer & Laamanen, 2014; Feldman, 2000).

Building on this literature, we theorize that downsizing, like other large-scale changes, disrupts organizational processes through multiple mechanisms. First, downsizing damages psychological contracts between a firm and its remaining (surviving) employees (Arshad, 2016). Psychological contract theory suggests that individuals and employers enter into a trust-based informal agreement, whereby employees exchange their work in return for fair pay and a positive, secure work environment. Downsizing breaches this contract, which can lead to negative employee behaviors including a lack of engagement, reduced loyalty, and fewer organizational citizenship behaviors (De Meuse & Dai, 2013). Survivors often come to view their firms as less than ideal employers and thus turnover is likely to increase (De Meuse & Dai, 2013; Arshad, 2016). In addition, remaining employees may be overworked, leaving them less time for important activities such as developing external networks, which has been linked to value-generating activities like innovation (Rusaw, 2004; Scalzo, 2006). Other well-documented survivor reactions include increased stress (Brockner et al., 1994; Jacobson, 1987), loss of managerial trust (Aryee & Chen, 2004), and increased workloads (Amabile & Conti, 1999). Ultimately, breaches in psychological contracts can reduce productivity and therefore reduce performance (De Meuse & Dai, 2013). Such consequences make bankruptcy more likely.

Second, downsizing firms often lose valuable knowledge and human capital. Human capital has been shown to lead to higher performance and is even more critical when it is firm-specific. While firms may try to retain their most valuable employees, unintended human capital losses are likely (Fisher & White, 2000; Schmitt, Borzillo, & Probst, 2011) and remaining employees may be incapable of extending their skills to fill these gaps (Massingham, 2008).

Third, and even more critical from an organizational change perspective, is the loss of social capital when employees exit. Social capital exists within networks of relationships internal and external to a firm, and is an essential ingredient in the creation of competitive advantage (Nahapiet & Ghoshal, 1998). It is needed to effectively reconfigure routines, which are recurrent patterns of activities that emerge over time (Brauer & Laamanen, 2014), and upgrade capabilities after downsizing (Schenkel & Teigland, 2016). These changes, however, are more difficult because social capital losses from downsizing damage existing routines, social networks, and organizational memory (Shaw et al., 2005; Schenkel & Teigland, 2016) by increasing the time required to access information and solve non-routine problems (Rusaw, 2004; Scalzo, 2006) and reducing the breadth of potential solutions generated (Moorman & Miner, 1998). Survivors must focus on transferring and acquiring knowledge rather than applying knowledge they already have (Kacmar, Andrews, Van Rooy, Steilberg, & Cerrone, 2006), resulting in lower productivity and decreased efficiency (Holtom & Burch, 2016). Similarly, groups become less effective in how they communicate and interact, reducing their task accomplishments, and adversely impacting firm outcomes (Anderson & Lewis, 2014). These disruptions can increase the likelihood that firms will fail (Hannan & Freeman, 1984).

Given that these disruptions can inhibit the effective functioning of firms, we suggest that downsizing sets firms on a negative path that may be difficult to reverse (Datta & Iskandar-Datta, 1995; Hambrick & D'Aveni, 1988). Supporting our theorizing, research has shown that organizational changes increase the likelihood of failure (Amburgey, Kelly,

& Barnett, 1993; Swift, 2016). Studies have also found that downsizing tends to decrease performance and increase leverage, which increases the likelihood of financial distress (Verwijmeren & Derwall, 2010). Thus, the damage inflicted by downsizing on employees, firm knowledge bases, and routines makes it more difficult to effectively rebuild routines, reconfigure resources, and implement other necessary changes. Accordingly, we propose:

Hypothesis 1. Firms that downsize are significantly more likely to declare bankruptcy than non-downsizing firms.

2.1. Preventing bankruptcy: the role of resources

Because firms strive for positive outcomes after downsizing, understanding how firms can mitigate possible detrimental outcomes is of great importance. Firms must find ways to replace or work around the loss of human resources and the related disruptions to social capital and organizational routines. Thus, we look to insights from the resource-based view to investigate how resource factors might enable firms to reduce negative outcomes following downsizing. Prior research on the resource-based view, while vast, has yet to examine the role of resources in preventing the likelihood of bankruptcy following downsizing. For example, Norman et al. (2013) examined the resources of downsizing firms to determine whether they were more likely to go bankrupt, be acquired, or remain a going concern, but did not compare downsizing to non-downsizing firms. Still unresolved is whether certain resources might be more useful for downsizing firms than for other firms. After downsizing, to counteract negative consequences, a firm must leverage its available resources to enact positive changes, such as recreating or adapting social networks and organizational routines (Brauer & Laamanen, 2014; Schenkel & Teigland, 2016). Thus, we extend prior research on the role of resources and downsizing by examining whether a firm's intangible, financial, and physical resources (Chatterjee & Wernerfelt, 1991) can help counteract human capital losses and the accompanying disruptions from downsizing. We visually depict these relationships in Fig. 1.

2.1.1. Intangible resources

We suggest that valuable, intangible resources enhance a firm's ability to negate the pitfalls of downsizing. Intangible resources are those that cannot be easily quantified and include patents, firm reputation, and employee knowledge. In line with prior literature, we conceptualize intangible assets as those assets which add value above and beyond the book value of a firm's assets (Kaplan & Norton, 2004). For example, reputation and brand strength are valued by the market and contribute to competitive advantage, but they are not recorded as assets on a firm's balance sheet. While all types of resources matter, intangibles are particularly important because they often form the basis of routines,

capabilities, and competitive advantage (Barney, 2001), are more difficult to replicate and substitute than other resources (Capron & Hulland, 1999), and help firms to acquire other valuable resources (Zott & Huy, 2007).

Given the flexibility of intangible resources (Sirmon, Hitt, & Ireland, 2007), firms can recombine and redeploy such resources after downsizing. Intangible resources facilitate organizational reconfigurations because their exclusivity provides a cushion allowing firms to make less hasty, more measured decisions. In addition, intangible resources such as brands, intellectual property, and reputation can continue to be leveraged after downsizing (Norman et al., 2013). Intangible resources also signal to alliance partners and shareholders that the firm is viable, helping to fill resources gaps by attracting new partners or investments. Thus, downsizing firms with larger endowments of intangible resources should be better positioned to counteract any negative changes and avoid bankruptcy. Thus, we suggest:

Hypothesis 2. Intangible resources are significantly more valuable in preventing the likelihood of bankruptcy for downsizing firms than non-downsizing firms.

2.1.2. Financial resources

Financial resources are tangible resources that can be used for a variety of purposes including absolving debt obligations and purchasing more specific resources to help build a competitive advantage (Chatterjee & Wernerfelt, 1991). Excess financial resources are beneficial for innovation, learning, and change. These resources allow firms to allocate time and effort towards identifying and pursuing new opportunities as well as experiment with ways to restructure internal routines so that they are more effective (Iyer & Miller, 2008). In addition, financial resources can help firms attract alliance partners or better leverage other remaining resources. For example, firms can use financial resources to fund innovation, introduce new products, launch marketing campaigns, or bolster customer benefits to mitigate possible service hiccups experienced due to personnel changes during downsizing. GoPro, for example, laid off 7% of its staff in 2015 and subsequently announced plans to enhance software programs that benefit existing customers (Goldman, 2016). Firms can also enhance the knowledge and skills of survivors by funding training and professional development, which helps fill gaps in expertise left by downsizing. Further, financial resources can be used to enhance the compensation packages of remaining employees, thereby reducing turnover among remaining employees.

The bankruptcy literature has long recognized the importance of liquidity in preventing bankruptcy (Altman, Iwanicz-Drozdzowska, Laitinen, & Suvas, 2014; James, 2016). Not surprisingly, a review of 165 bankruptcy prediction studies found that performance and liquidity measures were the two most used predictors of bankruptcy (Bellovary,

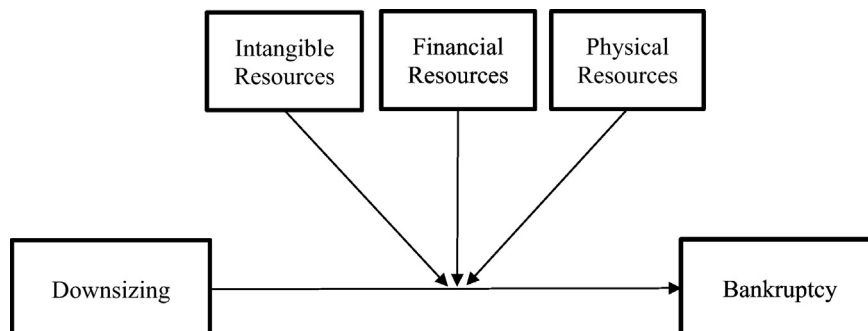


Fig. 1. Theoretical model of proposed relationships.

Giacomino, & Akers, 2007). Thus, while financial resources are important for all firms, we expect downsizing firms with access to greater financial resources will be able to leverage them to reduce the likelihood of bankruptcy. Accordingly, we predict:

Hypothesis 3. Financial resources are significantly more valuable in preventing the likelihood of bankruptcy for downsizing firms than non-downsizing firms.

2.1.3. Physical resources

Physical resources are tangible, fixed assets such as equipment, plants, or property that can readily be valued and aid firms in accomplishing their operational goals. The resource-based view suggests that such resources provide value to the extent that they represent investments that can be exploited when combined with other resources or when they confer an advantage that others find difficult to imitate, such as unique retail locations or specialized equipment (Barney, 1991; Eisenhardt & Martin, 2000). Yet, physical resources alone may not be enough to overcome adverse effects from downsizing. For example, 3D printers, which are physical resources, in the hands of knowledgeable employees can enable firms to rapidly and inexpensively test prototypes before settling on a final product design. But as firms downsize and lose valuable human capital, such physical resources alone are unlikely to provide significant value. Similarly, physical resources are unlikely to reduce remaining employee stress or turnover.

While the bankruptcy literature has stressed the importance of financial assets and examined the role of intangible assets, tangible assets have played a lesser role in bankruptcy prediction. However, both the ability to sell fixed assets and their use for other productive purposes facilitate the ability of firms to successfully reorganize and emerge from bankruptcy (Bauer, 2014; Gilson, Hotchkiss, & Osborn, 2016). Thus, while physical resources are of value to all firms because they facilitate ongoing operations or can be sold or leased to yield additional financial resources, they are unlikely to fill resource gaps left from downsizing. Accordingly:

Hypothesis 4. Physical resources are *not* significantly more valuable in preventing the likelihood of bankruptcy for downsizing firms than non-downsizing firms.

3. Method

3.1. Data and sample

Our sample consists of all publicly-traded US firms listed in the Compustat database with available financial information for 2010. We selected 2010 to allow examination of bankruptcy outcomes in the five years following the downsizing event (2011–2015). Further, 2010 marked a year of significant positive growth in GDP from 2009, and the five years following have been a period of relative stability, with slight positive growth (World Bank, 2017). After removing firms with inadequate data, we had a maximum useable sample size of 4710 firms. Our sample firms span 83 different industries (3-digit NAICS codes); include service, high-technology, and manufacturing firms; and average \$3.7 billion in sales and 10,000 employees. We identified downsizing firms as those that had at least a 3% reduction in total employees from 2009 to 2010 (Goesaert et al., 2015). Roughly 24% of our sample firms downsized in 2010, including firms such as Regal Cinemas, Petmed Express, and Ford. In post hoc *t*-test comparisons, downsizing firms that declared bankruptcy and downsizing firms that did not declare bankruptcy did not differ in prior performance, total assets, or total sales. However, these firms did differ significantly in terms of industry and marginally in terms of net income, suggesting that firms that went bankrupt may have operational inefficiencies that were not alleviated by downsizing.

3.2. Variables

3.2.1. Bankruptcy

Our dependent variable, indicates whether a firm filed for Chapter 11 bankruptcy. Chapter 11 bankruptcy legally exists so that firms can restructure their balance sheets and avoid liquidation. *Bankruptcy* is a dummy variable that was coded as a 1 when a firm declared bankruptcy before the end of 2015 and 0 otherwise (James, 2016; Jones, 2011). Bankruptcies were identified using the UCLA-LoPucki Bankruptcy Research Database (BRD), which captures all US publicly-traded companies that have declared bankruptcy since 1979. We further ensured that we captured all bankruptcies using data from the Bloomberg Terminal.

3.2.2. Downsizing

Our primary independent variable of interest, *downsizing*, is measured with a 0/1 indicator, where 1 indicates that a firm downsized (Powell & Yawson, 2012; Yu & Park, 2006). Following Goesaert et al. (2015), firms were classified as downsizing if they reduced their total number of employees by 3% or more between 2009 and 2010. Given our mean number of employees of roughly 10,000, this suggests a minimum layoff of approximately 300 employees.

3.2.3. Resources

Empirical studies have shown that a significant part of the difference between a firm's investor valuation and its book value is due to intangible resources not accounted for on a firm's books (Shaikh, 2004). Following prior research (Chadwick, Guthrie, & Xing, 2016; Villalonga, 2004), we used Tobin's *q* as a measure of *intangible resources*. We used the following simple *q* ratio in our calculations (Perfect & Wiles, 1994):

$$q = \frac{\text{Market Value} + \text{Total Debt} + \text{Preferred Stock Liquidation Value}}{\text{Book Value of Assets}}$$

where each component was measured at year-end and total debt is the sum of long-term and short-term debt obligations. *Financial resources* were measured using the current ratio, current assets divided by current liabilities, which reflects the amount of readily available financial assets at managers' disposal (Iyer & Miller, 2008). *Physical resources* were measured using net value of plant, property, and equipment divided by assets (Adler, Capkun, & Weiss, 2013).

3.2.4. Control variables

We controlled for other factors that prior research indicates could influence either bankruptcy or downsizing. Because poor performance has been associated with both downsizing and bankruptcy, we controlled for *prior performance* using industry-adjusted (3-digit NAICS code) prior year return on assets (ROA). ROA was calculated as net income divided by total assets. Similarly, we capture firm *profitability* using return on equity (ROE). ROE was calculated using net income divided by equity. To control for the concern that downsizing firms may be on a trajectory towards bankruptcy, and thus bias our results towards bankruptcy, we included Altman's Z. Altman's Z has been shown to accurately predict the likelihood that firms will declare bankruptcy (Altman et al., 2014) and was calculated using the following formula:

$$Z\text{-Score} = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E$$

where A is the ratio of working capital to total assets, B is the ratio of retained earnings to total assets, C is the ratio of earnings before interest and taxes to total assets, D is the ratio of the market value of equity to total liabilities, and E is the ratio of sales to total assets (Iyer & Miller, 2008). A higher Z-score indicates that firms are less likely to go bankrupt in the future. To control for the current debt position of the firm (i.e., *leverage*), we used a firm's debt to equity ratio, calculated as total liabilities divided by equity. We also controlled for current *liquidity*

using the cash ratio. We calculated liquidity using the proportion of cash to current liabilities. To control for *firm size*, which may affect bankruptcy declarations (Altman, Sabato, & Wilson, 2010), we included the natural log of employees. Similarly, we controlled for *capital expenditures* using capital expenditures divided by total assets. In addition to our industry fixed effects and clustered robust standard errors, we also controlled for several relevant industry factors. *High-tech* firms may differ in their human capital usage as well as intangible assets, thus we controlled for firms in a high-tech industry by including a dummy indicator, where 1 indicates a firm was in a high-tech industry as classified by the American Electronics Association. Industries also differ in the extent to which they rely on knowledge workers, who are highly educated and highly skilled (von Nordenflycht, 2011). Because downsizing may have different effects in firms that are heavily reliant on knowledge workers (e.g., managers, engineers, scientists, editors, programmers), we controlled for *industry knowledge intensity*. This measure is the proportion of workers in an industry (2-digit NAICS) in occupational codes below 30-0000 in the 2010 Occupational Employment Statistics survey from the Bureau of Labor Statistics (Coff, 2002).

We also included additional controls that capture the potential reason behind the downsizing. First, we controlled for *change in market capitalization*—market value of equity plus long-term debt—from the close of 2008 to the close of 2009. This measure captures whether firms are downsizing reactively because of a decline in market value (Love & Nohria, 2005). Second, firms often downsize following an acquisition (Krishnan, Hitt, & Park, 2007). To control for this likelihood, we included a count of the number of acquisitions in the 5-years prior to the focal year. We also controlled for the amount of human resources slack (HR slack) prior to the downsizing. *HR slack* is calculated as [(firms employees / firm sales) – (industry employees / industry sales)]. Firms with excess employees may be more likely to downsize or have more success from such a move (Love & Nohria, 2005). To ensure that grouping relatively small downsizing events with larger downsizing events in our primary measure was not driving our results, we also controlled for the percentage reduction in each downsizing firm's workforce. *Percent downsized* is a continuous measure, with firms that downsized < 3% coded as 0.

3.3. Analysis

Our models were estimated using logistic regression. To control for industry differences, we included industry fixed effects (i.e., dummy variables) and clustered robust standard errors. We captured industries using 2-digit NAICS codes. To determine whether multicollinearity was a factor in our models, we assessed correlations and examined variance inflation factors, which all fell well below the commonly accepted cutoff of 10 (Kutner, Nachtsheim, & Neter, 2004).

3.4. Results

Means, standard deviations, and correlations are shown in Table 1. The results of our logistic regression analyses are presented in Table 2. Model 1 includes only control variables, Model 2 includes the main effect for downsizing, Model 3 adds the main effects for the resource measures, Models 4–6 add individual interactions for each resource type and downsizing, and Model 7 is our full model. Hypothesis 1, which predicted that downsizing firms are significantly more likely to declare bankruptcy than non-downsizing firms, is supported by the coefficient for downsizing in Model 2 ($b = 0.72, p = 0.04$). Exponentiating the coefficient reveals that the odds of a downsizing firm declaring bankruptcy are twice that of a non-downsizing firm.

Hypothesis 2 predicted that intangible resources would be significantly more valuable in preventing bankruptcy for downsizing firms than non-downsizing firms. This hypothesis was supported by the negative coefficients for the interaction between downsizing and intangible resources in Model 4 ($b = -0.58, p = 0.06$) and Model 7 ($b = -0.58, p = 0.07$). These results suggest that intangible resources are indeed capable of reducing the likelihood that downsizing leads to bankruptcy and that intangible assets are more important for downsizing firms than for non-downsizing firms in staving off bankruptcy. As shown in Fig. 2, the amount of intangible resources held by downsizing firms significantly influences the likelihood of bankruptcy. Downsizing firms with high stocks of intangible resources have a substantially lower likelihood of bankruptcy than both non-downsizing firms and downsizing firms with low stocks of intangible resources. Our results suggest that

Table 1
Descriptive statistics and correlations¹.

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Bankruptcy	0.01	0.11													
2 Prior performance	0.01	11.85	0.00												
3 Profitability	-0.16	8.55	0.00	-0.01											
4 Altman's Z	-34.80	1166	0.00	0.24	0.00										
5 Leverage	1.44	69.12	0.00	-0.01	-0.26	0.00									
6 Liquidity	10.53	228.50	0.00	0.00	0.00	0.00	0.00								
7 Firm size	1.34	1.37	-0.01	0.04	0.03	0.03	0.00	-0.03							
8 Capital Exp.	0.35	4.72	0.02	0.00	0.00	0.00	0.00	0.00	-0.06						
9 High-tech	0.21	0.41	-0.01	0.00	-0.01	0.01	0.00	-0.01	0.00	-0.03					
10 Industry knowledge intensity	25.82	16.24	-0.01	0.00	-0.02	0.00	0.02	0.00	-0.02	-0.02	0.29				
11 Change in market cap	715.02	4622	-0.01	0.01	0.00	0.01	-0.01	0.00	0.24	-0.01	0.01	-0.01			
12 Prior acquisitions	0.66	1.14	-0.02	0.02	0.00	0.02	-0.01	-0.01	0.30	-0.02	0.08	0.13	0.12		
13 HR slack	0.02	0.37	0.00	-0.01	0.00	-0.01	0.00	0.00	-0.03	0.11	-0.00	-0.00	0.00	-0.01	
14 Pct. downsized	0.04	0.11	0.00	-0.03	-0.02	0.00	0.00	0.00	-0.18	0.03	-0.02	0.00	-0.05	-0.07	0.00
15 Downsizing	0.24	0.43	0.02	0.00	-0.02	0.01	0.02	-0.01	-0.08	0.01	-0.01	-0.01	-0.05	-0.05	0.01
16 Intangible	11.70	443.21	0.00	-0.16	0.00	-0.09	0.00	0.00	-0.02	0.01	0.00	0.00	0.00	-0.01	0.03
17 Financial	3.30	17.97	-0.01	0.01	0.00	0.06	0.00	0.10	-0.07	0.07	-0.02	-0.03	-0.01	-0.03	0.00
18 Physical	0.55	0.52	0.04	-0.04	0.00	0.01	0.02	-0.03	-0.01	0.03	-0.12	-0.16	-0.02	-0.14	0.02
	Variables			14			15				16			17	
14	Pct. downsized														
15	Downsizing				0.64										
16	Intangible				0.05		0.02								
17	Financial				0.00		-0.01				0.00				
18	Physical				0.01		0.07				-0.02				-0.06

¹ Values >0.03 fall within the 95% confidence interval ($p < 0.05$).

Table 2
Results of logistic regression^{a,b}.

	Model 1 Bankruptcy	Model 2 Bankruptcy	Model 3 Bankruptcy	Model 4 Bankruptcy	Model 5 Bankruptcy	Model 6 Bankruptcy	Model 7 Bankruptcy
Prior performance	0.01 (0.01)	0.01 (0.01)	0.13 (0.18)	0.13 (0.18)	0.14 (0.18)	0.13 (0.18)	0.13 (0.18)
Profitability	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Altman's Z	0.00 (0.00)	0.00 (0.00)	0.00 (0.02)	-0.00 (0.02)	0.00 (0.02)	0.00 (0.02)	-0.00 (0.02)
Leverage	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Liquidity	-0.04 (0.02)	-0.04 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.01)
Firm Size	0.01 (0.05)	0.01 (0.05)	0.00 (0.05)	0.01 (0.05)	0.00 (0.05)	0.00 (0.05)	0.01 (0.05)
Capital Expenditures	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)
High-Tech	-0.08 (0.22)	-0.09 (0.21)	-0.05 (0.20)	-0.04 (0.20)	-0.05 (0.20)	-0.05 (0.20)	-0.04 (0.20)
Industry knowledge intensity	-0.04*** (0.00)	-0.05*** (0.00)	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.04*** (0.01)
Change in market cap	-0.00* (0.00)	-0.00† (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Prior acquisitions	-0.15 (0.20)	-0.15 (0.19)	-0.14 (0.19)	-0.13 (0.19)	-0.13 (0.19)	-0.14 (0.19)	-0.13 (0.19)
HR slack	-6.09 (6.10)	-6.20 (6.15)	-4.57 (7.72)	-4.61 (7.94)	-4.20 (7.33)	-4.49 (7.72)	-4.18 (7.83)
Pct. downsized	-0.30 (0.97)	-2.23† (1.29)	-2.44 (1.59)	-2.58 (1.66)	-2.86† (1.61)	-2.43 (1.54)	-2.98† (1.68)
Downsizing		0.72* (0.34)	0.63† (0.35)	1.45* (0.64)	0.62† (0.36)	0.81** (0.28)	1.59** (0.57)
Intangible			-0.28 (0.24)	-0.20 (0.24)	-0.28 (0.24)	-0.28 (0.24)	-0.20 (0.24)
Financial			-0.08 (0.05)	-0.07 (0.05)	-0.10 (0.07)	-0.08 (0.05)	-0.10 (0.07)
Physical			0.12 (0.15)	0.11 (0.14)	0.11 (0.15)	0.19 (0.12)	0.16 (0.11)
Downsizing X Intan.				-0.58† (0.31)			-0.58† (0.32)
Downsizing X Fin.					0.07 (0.07)		0.07 (0.07)
Downsizing X Phys						-0.24 (0.26)	-0.21 (0.26)
N	4710	4710	4641	4641	4641	4641	4641
Pseudo R ²	0.07	0.07	0.08	0.08	0.08	0.08	0.08

^a Robust standard errors clustered by industry in parentheses.

^b Pseudo R² provides an overall model fit in logistic regression and is akin to the traditional R² metric in OLS.

† p < 0.10.

* p < 0.05.

** p < 0.01.

*** p < 0.001.

downsizing firms with low intangible resources have the greatest likelihood of bankruptcy.

Hypothesis 3 predicted that financial resources would be significantly more valuable in preventing bankruptcy for downsizing firms than

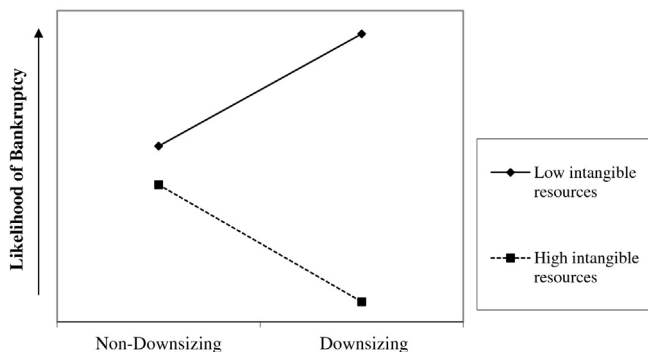


Fig. 2. The interaction between downsizing and intangible resources.

non-downsizing firms. As shown in Table 2, Model 5, this hypothesis was not supported (b = 0.07, s = 0.32). Hypothesis 4 predicted that physical resources would prove of similar value for downsizing and non-downsizing firms. As shown in Table 2, Model 6, we found support for this hypothesis (b = -0.24, p = 0.36).

In sum, these results lend support to our overall theorizing that downsizing can increase the odds of bankruptcy. We also found that intangible resources were more likely to reduce the risk of bankruptcy for downsizing than for non-downsizing firms. However, financial and physical resources were not of greater value for downsizing firms. We discuss the implications of our findings in the Discussion section, but first we turn to the robustness of our results.

3.5. Robustness

We took several steps to ensure the viability of our results. First, we tested models with data from a different time period. We confirm our presented results using a sample of firms with announced downsizings reported in the *Wall Street Journal* from 1995 to 2000 (e.g., Love & Nohria, 2005; Norman et al., 2013) that were each matched with a

non-downsizing firm of similar size in the same industry to control for possible self-selection and endogeneity concerns. This matched pair sample helps to address sample-section bias. Given that firms self-select by choosing to downsize, we do not know what would have happened had they not engaged in downsizing. Thus, by matching firms that downsize with firms that exhibit similar pre-downsizing characteristics that did not downsize, we help to alleviate selection bias concerns. Our results from this second sample, fully support our reported results.¹

Of particular concern in this line of research are endogeneity concerns stemming from either selection bias or from simultaneous causality. In other words, either firms self-select into the sample by downsizing or downsizing firms may have already been on a negative trajectory, making them inherently more likely to declare bankruptcy. We address endogeneity concerns in two ways. As noted above, we control for prior firm performance, leverage, prior change in market capitalization, and bankruptcy trajectory using Altman's Z. Altman's Z is a relatively accurate predictor of the likelihood that firms will declare bankruptcy in the future and thus helps to account for firm bankruptcy trajectory prior to the focal event (Altman et al., 2014). To further confirm our results, we tested our sample with a two-stage instrumental variables technique, a recommended method for reducing endogeneity concerns (Semadeni, Withers, & Certo, 2014). Given our binary outcome variable and binary independent variable, we estimated two-stage bivariate probit models using the number of previous downsizing events in the five years prior to the downsizing and the natural log of acquisition spending in the year prior to the downsizing event. We selected these instruments based on their significant correlation with the independent variable and weak or insignificant relationship with the dependent variable (thus making it unlikely that they are correlated with the error term). Our two-stage bivariate probit model confirmed our primary result that downsizing increases the likelihood of bankruptcy. Ultimately, these tests are supportive and suggest that endogeneity concerns are not driving our results.

Next, we examined different cutoff values for our dichotomous measure of downsizing (i.e., 5% and 10% downsizing indicators). Results for both 5% and 10% cutoffs supported our primary results, with downsizing significantly increasing the likelihood of bankruptcy.

Our study captures bankruptcy declarations in the five years following downsizing. We also sought to explore these results for different windows. That is, we investigated whether downsizing was linked to bankruptcy when we examined windows of 1, 2, 3, and 4 years following 2010. We found a relatively consistent relationship for each window with the only exception being two years following downsizing. Thus, it appears that the relationship between downsizing and bankruptcy is relatively stable when using different post-downsizing estimation periods and supports our notion that downsizing has long-term consequences for firms.

We also tested models that included controls for prior downsizing activity. The first was a count of the number of downsizings in the five years prior to our sample period and the second was percentage that the entire firm downsized in the five years prior to the focal downsizing. Our results were unchanged when including these controls and they were insignificant in each model. Similarly, we also tested our models using a control for firm age because newer firms have an increased likelihood of failure (Thornhill & Amit, 2003). Our results were substantively similar.²

4. Discussion

The primary focus of our study was to investigate whether downsizing places firms at a greater risk of bankruptcy and, if so, whether resources could help to mitigate that risk. Given that downsizing has

become a common business practice, it is important to understand the consequences of such a decision. We theorized that downsizing is a large-scale change that is often traumatic for employees and disruptive for firms. While capable of producing positive results, our findings suggest that downsizing puts firms on a negative path that makes bankruptcy increasingly likely. Even after controlling for numerous other factors including performance, bankruptcy trajectory, and industry factors, downsizing firms were significantly more likely to declare bankruptcy than non-downsizing firms. While not always fatal, downsizing does increase the odds that a firm will declare bankruptcy. This finding is in line with work that shows that large-scale organizational changes introduce disruptions that increase the likelihood of bankruptcy (Amburgey et al., 1993; Powell & Yawson, 2012; Swift, 2016) and extends previous findings on the downsizing/bankruptcy relationship to US firms in recent years.

Given the disruptions that are introduced during downsizing, it is critical for managers to understand how to better position their firms to experience positive rather than negative outcomes. Therefore, we sought to provide further insights about what factors might help firms to mitigate detrimental effects and reduce the likelihood of bankruptcy. Drawing on the resource-based view, we examined whether a firm's intangible, financial, and physical resources could lessen the likelihood of bankruptcy for downsizing firms. We found support for the positive role that intangible resources play. The interaction between downsizing and intangible resources indicates that intangibles help downsizing firms to stave off bankruptcy. Our finding suggests that a larger base of intangible resources allows a firm to consider a wider range of options when reorganizing following downsizing. We theorize that firms with greater intangible resources can redeploy such resources in unique and, perhaps, creative ways after downsizing that can help to prevent negative outcomes. Indeed, intangible resources, such as employee knowledge, can be leveraged to work around processes that have been interrupted due to employee losses or to replace these processes with more efficient ones. Similarly, because these assets can be used in a variety of ways (Sirmon et al., 2007), they may be able to attract alliance partners that can fill resource gaps and thereby soften the blow experienced by downsizing firms. Alternatively, an absence of intangible resources to draw upon limits firms' available options and these options are likely to be less attractive than firms with higher intangibles. Our study suggests that intangibles are especially important for firms as they undergo major changes, most notably when those changes require adjustments to existing routines, as is the case for downsizing firms (Brauer & Laamanen, 2014).

Our results show that, unlike intangibles, neither financial nor physical resources significantly changed the likelihood of bankruptcy following downsizing. The finding for physical assets was as predicted, whereas the finding for financial resources was somewhat surprising. Prior theory has suggested that physical resources alone may not prove especially valuable (Barney, 1991). Our results agree and, at a minimum, suggest that simply having physical resources is not enough to counter large-scale changes following downsizing. In simple terms, we believe that physical assets, such as property or equipment, cannot substitute for valuable human capital losses. That is, holding, or even selling, physical asset does not replace the downsized employees, who fulfill multiple roles as workers, knowledge bearers, and cultural contributors within the firm. Because having ample capital is often viewed as a corporate panacea that is always valuable, it was unexpected and interesting to find that financial resources were largely insignificant in our models and did not contribute to the prevention of bankruptcy for downsizing firms. We theorize that this result may be likely for several reasons. First, prior research has shown that downsizing causes disruptions to key long-term value creating mechanisms, such as knowledge and routines; it may be that these challenges cannot be overcome by simply having more capital. That is, routines and process are interrupted and simply throwing more money at this type of problem may be ineffective. Second, firms may be unaware of the potential increases in

¹ Results for this sample set are available upon request.

² Because this information is not available for all firms, we did not include firm age in the presented models.

employee stress due to downsizing and therefore not use their financial resources in the ways that could prove most beneficial to remaining employees. Even with awareness and availability of resources, firm efforts to mitigate the negative impacts that survivors experience may not have the desired effect. Providing bonuses, for example, may not improve employee attitudes or decrease stress following downsizing. Finally, this finding may occur because financial resources, unless used to hire new employees, do not provide a direct substitute for the knowledge, skills, and abilities of the lost employees. If financial resources were used for the specific purpose of assuaging remaining employee concerns, revamping processes and routines, or even hiring new employees, then financial resources could perhaps reduce these negative effects. However, we speculate that this often may not be the case.

Ultimately, our findings regarding physical and financial resources are supported by resource-based theory, which suggests that more complex, higher-order resources, like intangible assets, are the most valuable and that more simplistic resources, such as physical or financial resources, alone, do not lead to such advantages. We speculate that perhaps when these resources are combined or bundled with other resources in unique ways, they may prove more effective. However, our research suggests that alone these resources, which lack rarity and non-substitutability, are not enough to help downsizing firms prevent bankruptcy.

4.1. Implications for researchers

Our study has several important implications for researchers examining the outcomes of downsizing. Prior research has typically looked at the relationship between downsizing and firm performance, yet performance measures alone may not capture all of the consequences of downsizing. Furthermore, many performance studies examine 1- to 3-year windows following downsizing and thus may not fully capture its long-term consequences. Our time window spanned 5 years following the downsizing and thus allowed us a longer-term view. Overall, while previous studies have noted that positive results are possible (Love & Nohria, 2005; Yu & Park, 2006), the risk of very negative outcomes may not be fully captured in performance metrics. Losses of human capital, disruptions to routines and memory, and negative effects on remaining employees may create a path dependent process that is difficult for some firms to reverse once underway. Ultimately, a non-financial measure such as bankruptcy helps to capture the potentially severe consequences of downsizing.

Next, by examining the role that remaining resources have in lessening the downside of large-scale changes, this study helps to illuminate the role resources play in firms' ability to adapt to organizational changes. Prior research on organizational change suggests that "the question of whether change is hazardous should be replaced by the questions of under what conditions change may be hazardous or helpful and whether the direction of change affects its impact on performance and survival" (Haveman, 1992, p. 1). We build on this notion and find support for the idea that intangible resources can help firms to mitigate the potentially significant consequences that accompany large-scale organizational changes. While we find support for some of the key predictions of the resource-based view in regards to intangible resources, we also find important boundary conditions in that having more capital or more physical resources alone are of limited value in combatting the negative consequences of change.

Finally, our findings have implications for research examining whether resources have substitution effects (Peteraf & Bergen, 2003). While prior research suggests that resource substitution can occur between competing firms, we build on this by highlighting that within a firm, resources may be able to substitute for one another. When downsizing firms lose human resources, some of the value of these resources can be replaced or substituted for using valuable intangible resources. If, for example, firms lose employee knowledge when they downsize, they may be able to leverage a valuable brand to attract an

alliance partner with similar skills to those that were lost. Thus, our findings imply that, at times, resources may substitute for one another.

4.2. Implications for practice

A primary implication for practice is that managers must undertake downsizing with a clear understanding of the potential risks and tradeoffs of such actions. Downsizing may involve changes that affect knowledge, routines, and the productivity of remaining employees. It is widely recognized in the literature that these changes are often disruptive and can be difficult to overcome, yet managers frequently engage in downsizing. Our findings suggest 1) that managers should carefully consider whether any potential positive returns will outweigh potentially severe consequences and 2) that managers should fully assess their resource portfolio prior to downsizing to determine whether their remaining resources can adequately protect the firm from negative consequences. Furthermore, managers must consider that remaining resources are not all of equal value. Firms planning to downsize must focus carefully on their intangible resources, rather than financial or physical ones, because these will be critical as firms lose human capital.

Next, our findings have broader implications for managers who choose to downsize as a part of a larger restructuring plan. Organizational restructuring, at times, involves selling off various assets while simultaneously laying off employees. When firms plan to downsize as part of a larger restructuring, they must ensure that they retain key resources that can increase the likelihood that negative outcomes are minimized. Asset sales, particularly when such sales eliminate important intangible resources, may limit the ability of managers to counteract the negative effects from employee layoffs. Downsizing while simultaneously spinning off valuable intangible resources may increase the odds that firms will fail.

4.3. Limitations and future research

Our study, like most, suffers from certain limitations. These limitations, however, provide avenues for future research. Our study focuses primarily on downsizing. Future research could study the relationships between broader conceptualizations of restructuring and bankruptcy. For example, does restructuring that does not involve downsizing, create disruptions that increase the risk of bankruptcy? Another potentially interesting avenue is to study whether the value of resources varies in different forms of restructuring. In other words, are resources equally valuable in each form of restructuring? While we did not find that financial resources were particularly valuable for downsizing firms, it may be that firms that engage in portfolio restructurings are more dependent on financial resources to accomplish reorganizing goals.

Future research could also work to determine whether these relationships hold in a recessionary period. The prevalence of bankruptcy tends to increase in recessionary periods (Altman et al., 2014) and investors and creditors are likely to be more frugal, making internally held financial resources more powerful. Additionally, downsizing may garner less negative press during a recession when it may be expected that firms will engage in such activities. As more firms downsize, individual firms and managers are less likely to suffer reputational damage. This may make it easier for firms to retain and attract employees and other critical resources.

Another limitation is the use of secondary data sources. In this study, we were not able to identify how organizations redeploy resources post-downsizing to stave off bankruptcy. Therefore, researchers may wish to perform more inductive research to examine how organizations successfully redeploy different resources to prevent bankruptcy and other less severe, but still negative, outcomes.

A final limitation was our use of a holistic archival measure of intangible resources. While we follow prior research that has used archival measures such as Tobin's q to measure intangible resources, future

research could collect data on distinct types of intangible resources such as patents or reputation rankings. More refined measures would help create an even finer-grained understanding of how intangible resources help firms avoid bankruptcy.

A final interesting avenue for future research is continued investigation into the role of intangible resources, before and after downsizing. For instance, researchers could undertake a thorough examination of the extent to which changes in intangible assets lead to downsizing decisions. Similarly, future research could also use primary data to better delineate the process through which intangible resources aid firms following downsizing.

5. Conclusion

This research provides initial insight into the relationship between downsizing and bankruptcy. From an organizational change perspective, downsizing, like other large-scale changes, introduces disruptions that increase the likelihood that firms will experience severe negative consequences. Supporting this, we found that downsizing firms were more likely to declare bankruptcy than their peers that did not downsize. We then drew on the resource-based view to understand which resources, if any, could reduce this likelihood. We found that intangible resources help to reduce the likelihood of bankruptcy for downsizing firms, but that financial and physical resources do not play a significant role.

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