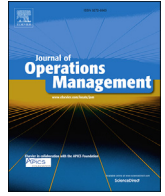




Contents lists available at ScienceDirect

Journal of Operations Management

journal homepage: www.elsevier.com/locate/jom

The link between operational leanness and credit ratings

David Bendig*, Steffen Strese, Malte Brettel

Innovation and Entrepreneurship Group (WIN), TIME Research Area, RWTH Aachen University, Kackertstraße 7, 52072 Aachen, Germany

ARTICLE INFO

Article history:

Received 20 June 2015

Received in revised form

9 November 2016

Accepted 25 November 2016

Available online xxx

Handling Editor: Mikko Ketokivi

Keywords:

Lean manufacturing

Operational slack

Inventory management

Capital intensity

Credit ratings

Finance/operations interface

ABSTRACT

Although there is rich literature documenting the positive relationship between operational leanness and financial performance, recent research indicates that the effects of leanness may be more complex than is typically assumed. We explore the impact of two kinds of leanness, relative inventory leanness and relative PPE leanness, on credit ratings. We thus use an alternative lens to explore the financial implications of leanness. We analyze secondary U.S. data from 1985 to 2012, with 11,197 firm-year observations of manufacturing firms. Using panel data analysis, we show that inventory leanness is positively associated with credit ratings in a concave relationship. This is consistent with previous research that has looked at the impact of relative inventory leanness on equity performance. Conversely, we find that PPE leanness is negatively related with credit ratings in a concave relationship—in contrast to prior studies addressing the impact of PPE leanness on equity performance.

© 2016 Elsevier B.V. All rights reserved.

1. Introduction

“Standard & Poor’s Ratings Services today raised its issuer credit ratings on Ford Motor Co. [...] We assume automakers competing in the U.S. market will generally continue a disciplined approach to production and inventory levels relative to sales, largely avoiding excess inventories or sharply higher incentives.”

– Standard & Poor’s, on Ford (2013).

“The enormous research and development and capital investment needed to extend manufacturing process capabilities and capacity [...] for next generation products represents a consistent call on capital but also a significant barrier to entry.”

– Moody’s, on Intel (2012).

These statements indicate that managers are not the only ones who ponder operational leanness. Rating agencies incorporate information on the topic when formulating their opinion about a firm’s ability to satisfy its financial obligations. As the lean

manufacturing philosophy has become increasingly important both in academia and in industry, leanness has become synonymous with excellence (Chen et al., 2005; Eroglu and Hofer, 2011a). In operations management research, however, two divergent views have emerged on the relationship between a firm’s leanness and its performance, as Modi and Mishra (2011) summarize. On the one hand, leanness may improve performance, since it implies lower costs and superior operational capabilities that promote a firm’s competitive advantage. On the other hand, leanness may be detrimental to performance, as it restricts flexibility, hampering a firm’s ability to respond to organizational changes and market shifts.

Recent research indicates that operational leanness is a more nuanced construct than was previously supposed. The first reason for this is that the relationship between relative leanness and equity performance has been shown in several studies to be positive and concave (Eroglu and Hofer, 2011a,b, 2014; Modi and Mishra, 2011). Financial performance initially increases with leanness, until a certain turning point, beyond which the incremental effects of leanness on performance become negative. It is likely that rating analysts are aware of this turning point when evaluating a firm. A second reason is that inventory and PPE leanness seem to relate differently to financial performance, depending on whether performance is measured from the perspective of credit or equity. Anderson and Mansi (2009, p. 704) argue that “corporate bondholders differ significantly from equity holders,” since bondholders

* Corresponding author.

E-mail addresses: bendig@time.rwth-aachen.de (D. Bendig), strese@time.rwth-aachen.de (S. Strese), brettel@time.rwth-aachen.de (M. Brettel).

“are particularly sensitive to the stability of anticipated future profits.” In this vein, credit rating analysts may negatively evaluate PPE leanness, as it reduces the buffer needed to respond to internal and external shifts. Similarly, prior work demonstrates that during supply chain disruptions, when buffers are essential, PPE leanness leads to negative stock market reactions (Hendricks et al., 2009). In contrast, Modi and Mishra (2011) and Kovach et al. (2015) find that operational leanness in general positively impacts equity performance. A third reason why operational leanness is complex is that there is a natural trade-off between leanness in inventory, a current asset, and PPE, a fixed asset (Boyer and Lewis, 2002; Skinner, 1969).

An extensive body of literature explores how operational leanness relates to equity performance measures. However, given that U.S. companies raise considerably more external financing in the form of debt than equity (Anderson and Mansi, 2009; Denis and Mihov, 2003), it seems relevant to examine the influence of operational leanness on credit ratings. Assigned by rating agencies, credit ratings assess a firm's creditworthiness based on the default and repayment probability; these ratings are used by owners and potential buyers of credit instruments such as corporate bonds (Alissa et al., 2013). The rating criteria take into account both inventory and PPE setups, and include lean management capabilities as well as expectations about a firm's long-term stability (Fitch Ratings, 2015; Moody's, 2015; Standard and Poor's, 2015). Our study addresses the following questions: Does operational leanness have a different effect on credit ratings than it does—as previously demonstrated—on equity performance? And how does the relationship with credit ratings vary between inventory leanness and PPE leanness?

To answer these questions, we conduct an empirical study of 1251 U.S. manufacturing firms, with a sample of 11,197 firm-year observations in the period from 1985 to 2012. We analyze inventory and PPE leanness, based on the Empirical Leanness Indicator (ELI) (Eroglu and Hofer, 2011a). The ELI evaluates a firm's operational leanness relative to firms of similar sizes in a specific industry, and, in contrast to other measures, takes into account economies of scale in inventory management. We integrate squared terms to examine inverted U-shaped relationships. We also add an interaction effect to investigate the trade-off between inventory and PPE leanness.

This study contributes to quantitative research on leanness by extending our understanding of the impact inventory leanness and PPE leanness have on financial robustness, particularly when an increase in relative leanness might make firms “brittle” (Abernathy, 1978; Adler et al., 2009). Our results confirm those of Modi and Mishra (2011) with respect to how relative inventory leanness relates to higher credit ratings. In contrast to their results, ours demonstrate negative effects of relative PPE leanness on credit ratings. Both relationships exhibit an inverted U-shape, indicating that leanness raises credit ratings to an optimum level beyond which credit ratings deteriorate. We are not able to demonstrate the interaction effect between inventory and PPE leanness suggested by theory.

The remainder of the paper is organized as follows. In Section 2, we provide the theoretical background and develop hypotheses. In Section 3, we describe our empirical methodology. Section 4 presents the corresponding analyses and results. In Section 5, we discuss the findings of our study.

2. Theoretical background and hypotheses

2.1. Credit ratings

Top managers and investors pay significant attention to credit ratings (Graham and Harvey, 2001) because the likelihood of

default signaled by low ratings has severe consequences on corporate financing, supply chain relationships, and many other areas (Hertzel et al., 2008). Credit ratings are relevant for two main reasons. First, they have a direct, measurable influence on the firm's bonds' interest rates and, generally speaking, the firm's cost of debt (Brigham and Daves, 2007). Second, ratings are forward-looking, and incorporate information beyond the balance sheet, including industry competitiveness, operational efficiency, and stability (Brigham and Daves, 2007; Standard and Poor's, 2015). Therefore, in contrast to accounting measures such as return on assets, credit ratings not only capture the present cost advantages of leanness that are reported in a financial statement, but also consider long-term benefits or risks resulting from lean operations (Attig et al., 2013).

Researchers argue that changes in ratings deserve particular attention, since they represent rare and major events for analysts, creditors, and obligors (Ederington and Goh, 1998; Kim et al., 2013; Kisgen, 2009). Rating changes happen when a firm's stability outlook alters substantially. For instance, unanticipated operational strains may lead to a downgrade. If ratings fall below a certain threshold, many institutional investors are inclined to sell a firm's bonds, with the firm possibly facing financing difficulties as a result (Brigham and Daves, 2007).

Rating agencies take operations into account when deciding on firm ratings. Most of the inventory-related rating criteria focus on efficiency in relation to industry competitors or FIFO/LIFO adjustments (Moody's, 2004; Standard and Poor's, 2008). Excess inventory is listed among the typical characteristics of weak debtors (Standard and Poor's, 2015). The criteria involving PPE are more ambiguous, as relative PPE leanness can lead to either higher or lower (perceived) default risks. On the one hand, rating agencies view operational leanness as a positive factor since it supports an efficient cost structure (Moody's, 2015; Standard and Poor's, 2015). On the other hand, they consider PPE flexibility and slack as a positive sign, as it can foster sales growth (Standard and Poor's, 2015).

Shi and Yu (2013) highlight in their literature review that there is a lack of empirical research considering the creditor perspective on firm operations. An exception is an early study by Horrigan (1966) indicating that PPE slack—measured as sales-to-PPE ratio—is associated with higher credit ratings. The sales-to-inventory ratio shows no significant effect on credit ratings. However, the study does not consider leanness relative to industry competitors, and is based on only 130 ratings from 1959 to 1960.

2.2. Inventory leanness

According to the lean manufacturing philosophy, inventory is a buffer against uncertainty and should be minimized (Womack et al., 1990). Inventory leanness relative to firm size and industry is generally expected to have an overall positive financial impact, since, all else being equal, a higher degree of inventory leanness increases operating profits, and frees up cash to repay debt. External stakeholders such as rating analysts thus use lean inventory levels as a proxy for a firm's valuable operational capabilities (Lai, 2006; Ross, 1973) that may result in sustainable competitive advantages (Teece et al., 1997). An extreme “zero inventory” policy, however, is widely considered to be a mistake (Hopp and Spearman, 1996). If inventory levels are too lean, the firm risks running out of stock, which Hendricks and Singhal (2003) show to negatively impact equity valuation. Excessively lean inventories also limit the flexibility needed for optimal production lot sizing (Obermaier and Donhauser, 2012).

The link between inventory and equity performance, as measured by accounting and stock-return metrics, has been

Download English Version:

<https://daneshyari.com/en/article/5111642>

Download Persian Version:

<https://daneshyari.com/article/5111642>

[Daneshyari.com](https://daneshyari.com)