The Impact of Leverage on Trade Firms' Profitability and Liquidity Measures

Halil D. Kaya, Ph.D.
Associate Professor of Finance
Northeastern State University, Broken Arrow
OK 74012, United States

Abstract

In this study, I compare the financials of high-leverage and low-leverage U.S. trade firms during the 2000-2005 period. I focus on firms' profitability and liquidity values. My objective here is to see if leverage helps retailers and wholesalers in terms of profitability and liquidity. My results show that highly levered trade firms (i.e. both retailers and wholesalers) tend to suffer in terms of liquidity. On the other hand, while highly levered retailers tend to suffer across all three measures of profitability (i.e. profit margin, return on assets, and return on equity); the results for highly levered wholesalers are mixed. In contrast to retailers, highly levered wholesalers tend to have higher return on equity values when compared to low leverage wholesalers. I conclude that the finding of a higher return on equity value here for highly levered wholesalers is due to the severely depressed equity values for wholesalers.

Keywords Leverage · Trade Firms · Retailers · Wholesalers · Profitability · Liquidity

JEL Classification E32 · G30 · G31 · G32

1. Introduction

In this study, I investigate the profitability and the liquidity values of U.S. retailers and wholesalers during the 2000-2005 period. My objective is to see whether firm leverage is an important factor that explains these firms' profitability and liquidity values. If firm leverage is important in explaining these firms' financials, future research should control for it. In that case, the results of any research (i.e. professional or academic) that does not control for firm leverage would not be considered reliable.

My research here also defines how highly-levered retailers and wholesalers perform compared to retailers and wholesalers with relatively low levels of debt. In other words, my results here will show if leverage helps trade firms in terms of their profitability and liquidity ratios.

My third contribution is examining retailers and wholesalers separately. Most studies examine only one group, and although there are several studies that examine the two groups together, to the best of my knowledge, this is the first study that looks at the relation between leverage and profitability and also between leverage and liquidity for both retailers and wholesalers. Do the financials of these two groups relate to firm level leverage in a similar fashion? Are there any differences between the two groups?

My results here show that firm leverage is an important factor in explaining both retailers' and wholesalers' profitability and liquidity values. Both highly-levered retailers and highly-levered wholesalers tend to have lower liquidity values compared to low-leverage counterparts.

In terms of profitability, I find that, once again, highly-levered retailers suffer compared to their counterparts. However, my results for the highly-levered wholesalers are mixed. While two of the profitability measures are lower for these firms compared to their counterparts, the third measure, namely the return on equity measure is in fact higher compared to their counterparts. Does this mean that highly-levered wholesalers do not suffer in profitability? My answer here is no. The higher value of return on assets and the lower value of return on equity for these highly-levered firms is due to the severely depressed stock values for these firms. The highly-levered (i.e. badly managed) retailers' stock values also suffer, but not as much as the highly-levered wholesalers. The decrease in the stock values of highly-levered wholesalers is so severe that their net income looks higher relative to their depressed equity value.

I can conclude that both groups suffer in terms of liquidity and profitability, but wholesalers also deeply suffer in the stock market. The implication for both groups is the importance of leverage on their financials.

The paper proceeds as follows: Section 2 discusses the previous literature. Section 3 presents the hypotheses. Section 4 explains the data and the methodology. Section 5 shows the empirical results, and Section 6 concludes.

2. Literature

The previous research focuses on the macroeconomic environment and its impact on trade firms' financials. Some of these studies examine business cycles' impact on trade firms, while others examine the relation between monetary policy and trade firms' financials. Little et al. (2009) and Little, Little, and Coffee (2008) both examine the impact of recessions on retail firms' financial performance. Little, Little, and Coffee (2008) show that firms pursuing a differentiation strategy are not more likely to do better than those firms pursuing a cost leadership strategy in a recessionary period. Dooley, et al. (2010) find that while wholesalers respond late and drastically to recessions, retailers respond quickly and more conservatively.

Niskanen and Niskanen (2000) show that show that accounts payable are mostly affected by the supply of trade credit, firm size, interest rate level, the ratio of current assets to total assets, and insufficient internal financing. Blinder (1981) and Blinder and Maccini (1991) argue that, in a typical U.S. recession, declining inventory investment accounts for most of the decline in GDP. West (1992) compares the Japanese and US inventories and find that while US inventories were found to be sharply procyclical, Japanese inventories were only mildly procyclical. Zakrajek (1997) finds that a large portion of the volatility of the retail inventories over business cycles is due to fluctuations in internal financing. Irvine (1981) argues that variations in cost of capital could be related to business cycle.

Banerjee and Kaya (2013) find that retailers tend to do worse in recessions when compared to the wholesalers. They find that net working capital and long-term debt levels of wholesalers are not significantly affected by the business cycle, whereas retailers have significantly less net working capital and more long-term debt in the recessionary period compared to the expansionary period. Balas and Kaya (2013) show that in expansionary periods, trade firms improve both their liquidity and asset utilization measures. Trade firms have better liquidity ratios, and able to sell their inventories fast in expansionary periods. Therefore, they have more cash in these periods. They are also able to collect their receivables faster in these good times compared to the recessionary periods.

Kashyap et.al (1993) find that tighter monetary policy leads to more commercial paper issuance by the firms while bank loans decrease. Bernanke (1993) finds that monetary policy has a disproportionately larger effect on small firms. Gander (2012) shows that firms' retained earnings have a significant role in the insulation effect (i.e. monetary policy's impact is lessened). Oliner and Rudebusch (1996) show that larger firms are better insulated from a monetary shock. Bougheas et.al. (2005) show that firm size, risk and debt levels determine the tightening of firm credit when interest rates increase. They found that small, young and risky firms were more significantly affected by tight monetary conditions than large, old and secure firms.

Dimitrov and Tice (2006) show that bank-dependent firms suffer more in terms of lost sales during recessions. Gertler and Gilchrist (1994) find that small firms experience liquidity constraints during recessions. Dedola and Francesco (2005) show that the impact of monetary policy was stronger in industries that produced durable goods, had greater financing requirements (working capital) and a smaller borrowing capacity (i.e. smaller firm size and leverage ratio).

3. Hypotheses

In line with the previous literature, I expect firms with high debt levels to suffer financially when compared to other firms. First of all, high debt levels indicate that these firms are not successfully managed. Secondly, since they have been in decline for a while, this should be reflected in their financial statements (hence lower profits and lower liquidity values). Therefore, my hypotheses regarding these firms' liquidity and profitability values are:

Hypothesis 1: Highly-levered retailers have lower current ratios and quick ratios when compared to other retailers.

Hypothesis 2: Highly-levered wholesalers have lower current ratios and quick ratios when compared to other wholesalers.

Hypothesis 3: Highly-levered retailers have lower profit margins, lower return on assets values, and lower return on equity values when compared to other retailers.

Hypothesis 4: Highly-levered wholesalers have lower profit margins, lower return on assets values, and lower return on equity values when compared to other wholesalers.

4. Data and Methodology

The sample period is from January 1, 2000 to December 31, 2005. The sample consists of all retailers and wholesalers in U.S. that have their financials posted on Compustat database. Below are the variables that are used in the empirical analyses:

a. Profitability Measures:

Profit Margin: Net income/Sales
Return on Assets: Net income/Assets
Return on Equity: Net income/Equity

b. Liquidity Measures:

Current ratio: Current assets/Current liabilities
Quick ratio: (Current assets-Inventory)/Current liabilities

First, I formed my two subsamples: The retailers subsample and the wholesalers subsample. Then, using the median value of leverage (i.e. debt to assets) for the retailers, I created the high-leverage and the low-leverage retailers subsamples (i.e. high-leverage retailers are those that have leverage values above the median, and low-leverage retailers are those that have leverage values below the median). Then, I did the same for the wholesalers using the median value of leverage for the wholesalers. In the end, I had four subsamples: High-leverage retailers, low-leverage retailers, high-leverage wholesalers, and low-leverage wholesalers. In my high-leverage retailers and low-leverage retailers subsamples, I have 2,590 and 2,589 firms respectively. In my high-leverage wholesalers and low-leverage wholesalers subsamples, I have 2,197 and 2,204 firms respectively.

Table 1 reports the summary statistics for my Retailers and Wholesalers subsamples. There are 5,179 retailers and 4,401 wholesalers in total. When we look at the profitability values, we can see that the retailers are more profitable compared to the wholesalers. While the median values of profit margin, return on assets and return on equity are 1.50%, 0.85%, and 2.36%, respectively for the retailers, the corresponding numbers are 0.99%, 0.61%, and 1.96%, respectively for the wholesalers. On the other hand, when we look at the liquidity values (i.e. current ratio and quick ratio), we can see that the wholesalers are more liquid compared to the retailers. While the median values of current ratio and quick ratio are 1.65 and 1.00 for the wholesalers, the corresponding numbers are 1.62, and 0.59 for the retailers.

Next, I want to compare the high-leverage and the low-leverage firms. Since the distribution of the profitability and the liquidity values are nonnormal, I use nonparametric tests to compare the two groups. I run several nonparametric tests but only the results of the Wilcoxon 2-sample test are reported in Tables 2 and 3. The results of the other tests are similar to the Wilcoxon test's results.

Table 1: Summary Statistics for U.S. Retail and Wholesale Trade Firms

	Retail Firms			**Wholesale Firms**		
	Mean	**Median**	**St.dev.**	**Mean**	**Median**	**St.dev.**
Profitability Measures						
Profit margin %	-13.0	1.50	219.21	-17.4	0.99	398.06
Return on assets %	-1.46	0.85	20.96	-2.93	0.61	45.70
Return on equity %	12.60	2.36	738.80	1.28	1.96	85.48
Liquidity Measures						
Current ratio	1.97	1.62	1.75	2.18	1.65	4.76
Quick ratio	0.89	0.59	1.26	1.35	1.00	3.84
Cash&ST Investment %	18.18	10.92	19.06	12.32	5.36	16.28
Receivables %	18.37	11.41	18.28	42.86	42.35	17.70
Inventories %	56.23	59.92	24.52	37.75	39.26	20.13
N	5,179			4,401		

5. Empirical Results

Table 2 shows the results of the Wilcoxon test that compares the high-leverage and the low-leverage retailers' financials. As we can see from the table, the high-leverage retailers are in worse shape than the low-leverage retailers in terms of both profitability and liquidity. The median values of profit margin, return on assets and return on equity are 0.85%, 0.49%, and 1.67%, respectively for the high-leverage retailers, while the corresponding numbers are 2.89%, 1.59%, and 2.62%, respectively for the low-leverage firms (the differences are significant at 0.01% level). The median values of current ratio and quick ratio are 1.32 and 0.42 for the high-leverage retailers, while the corresponding numbers are 1.59 and 2.62 for the low-leverage retailers (again the differences are significant at 0.01% level)..

Therefore, both of my null hypotheses for retailers (i.e. Hypothesis 1 and 3) are confirmed. The high-leverage retailers tend to suffer in terms of both profitability and liquidity when compared to the other retailers.

Table 2: Comparison of High-Leverage and Low-Leverage Retailers

	High-Leverage		Low-Leverage		Wilcoxon Test
	Median	**St.dev.**	**Median**	**St.dev.**	**p-value**
Profitability Measures					
Profit Margin	0.85	43.92	2.89	132.95	<0.0001
ROA	0.49	7.68	1.59	11.36	<0.0001
ROE	1.67	407.45	2.62	18.58	<0.0001
Liquidity Measures					
Current Ratio	1.3156	0.6463	2.2266	2.3047	<0.0001
Quick Ratio	0.4217	0.4585	0.9684	1.7118	<0.0001
N	2,590		2,589		

Table 3 shows the results of the Wilcoxon test that compares the high-leverage and the low-leverage wholesalers' financials. As we can see from the table, the high-leverage wholesalers are in worse shape than the low-leverage wholesalers in terms of liquidity. The median values of current ratio and quick ratio are 1.39 and 0.85 for the high-leverage wholesalers; while the corresponding numbers are 2.36 and 1.41 for the low-leverage wholesalers (the differences are significant at 0.01% level).

Table 3: Comparison of High-Leverage and Low-Leverage Wholesalers

	High-Leverage		Low-Leverage		Wilcoxon Test
	Median	**St.dev.**	**Median**	**St.de.**	**p-value**
Profitability Measures					
Profit Margin	0.69	32.57	1.75	212.47	<0.0001
ROA	0.50	6.18	0.93	10.79	<0.0001
ROE	2.07	97.98	1.73	18.61	0.0156
Liquidity Measures					
Current Ratio	1.3911	0.6108	2.3605	6.8419	<0.0001
Quick Ratio	0.8529	0.3621	1.4120	5.5608	<0.0001
N	2,197		2,204		

The results are mixed for profitability values. While the high-leverage wholesalers tend to have lower profit margins and lower returns on assets compared to the other wholesalers, they tend to have higher returns on equity compared to the other firms. Our finding of higher return on assets values and lower return on equity values for these firms would imply that the equity values are too depressed for these firms. The stock values are so low for these firms that, in the end, net income seems high when compared to their equity values. Here, for wholesalers, we can say that Hypothesis 2 is confirmed while Hypothesis 4 is only partially confirmed. However, one can still argue that the high-leverage wholesalers suffer in terms of both profitability and liquidity when compared to the other wholesalers (considering the fact that lower stock values make net income look relatively higher while it is really low relative to assets and sales).

6. Conclusion

In this study, I compare the financials of high-leverage and low-leverage U.S. trade firms during the 2000-2005 periods. I focus on firms' profitability and liquidity values. My objective here is to see if leverage helps retailers and wholesalers in terms of profitability and liquidity.

My results show that highly levered firms (i.e. both retailers and wholesalers) tend to suffer in terms of liquidity. Highly-levered firms tend to have lower current ratios and quick ratios compared to low-leverage firms.

On the other hand, while highly levered retailers tend to suffer across all three measures of profitability (i.e. profit margin, return on assets, and return on equity); my results for highly levered wholesalers are mixed. While the high-leverage wholesalers tend to have lower profit margins and lower returns on assets compared to the other wholesalers, they tend to have higher returns on equity compared to the other firms. Our finding of higher return on assets values and lower return on equity values for these firms would imply that the equity values are too depressed for these firms. The stock values are so low for these firms that, in the end, net income seems high when compared to their equity values.

Therefore, we can conclude that, while both groups (i.e. financially distressed retailers and wholesalers) suffer in terms of profitability and liquidity; the highly levered wholesalers suffer much more in the stock market when compared to the highly levered retailers.

References

Balas, A.N. and Kaya, H.D. (2013). The Impact of Business Cycles on Wholesalers' and Retailers' Liquidity and Asset Utilization Measures. Journal of Business and Economic Perspectives, forthcoming.

Banerjee, G. and Kaya, H.D. (2013). The Impact of Business Cycles on Retail and Wholesale Firms' Asset Values, Leverage ratios and Cash Flows: Evidence from U.S. listed firms. Journal of Financial Management and Analysis, 25(2).

Bernanke, B.S. (1993). Credit in the macroeconomy. Quarterly Review, 18(1), 50-71.

Blinder, A. and Maccini, L.J. (1991). Taking Stock: A Critical Assessment of Recent Research on Inventories. Journal of Economic Perspectives, 5, 73–96.

Blinder, A.S. (1981). Retail Inventory Behavior and Business Fluctuations. Brookings Papers on Economic Activity, 2, 443–505.

Bougheas, S., Mizen, P. and Cihan, Y. (2006). Access to external finance: Theory and evidence on the impact of monetary policy and firm-specific characteristics. Journal of Banking and Finance, 30(1), 199-227.

Dedola, L. and Francesco, L. (2005). The monetary transmission mechanism: Evidence from the industries of five OECD countries. European Economic Review, 49(6), 1543-1569.

Dimitrov, V. and Tice, S. (2006). Corporate Diversification and Credit Constraints: Real Effects across the Business Cycle. Review of Financial Studies, 19(4), 1465-1498.

Dooley, K.J., Yan, T., Mohan, S., and Gopalakrishnan, M. (2010). Inventory Management and the Bull Whip effect during the 2007 Recession: Evidence from the manufacturing sector. Journal of Supply Chain Management, 46(1), 12-18.

Gander, J.P. (2012). Firm debt structure, firm size, and risk volatility in US Industrial Firms. Applied Financial Economics, 22, 387-393.

Gertler, M. and Gilchrist, S. (1994). Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms. Quarterly Journal of Economics, 109(2), 309-340.

Irvine, F.O. (1981). Retail Inventory Investment and the Cost of Capital. The American Economic Review, 71(4), 633-648.

Kashyap, A.K., Stein, J.C. and Wilcox, D.W. (1993). Monetary policy and credit conditions: Evidence from the composition of external finance. American Economic Review, 83(1), 78-99.

Little, P.L., Mortimer, J.W., Keene, M.A., and Henderson, L.R. (2009). Evaluating the effect of recession on retail firms' strategy using DuPont method: 2006-2009. Journal of Finance and Accounting

Little, P.L., Little, B.L., and Coffee, D. (2009). The Du Pont model: evaluating alternative strategies in the retail industry. Academy of Strategic Management Journal, 8.

Niskanen, J. and Niskanen, M. (2000). Accounts receivable and accounts payable in large finnish firms' balance sheets: what determines their levels. L T A 4 / 0 0 • P . 489 – 5 0 3 LTA, 2000 - lta.hse.f

Oliner, S.D. and Rudebusch, G.D. (1996). Monetary policy and credit conditions: Evidence from the composition of external finance: Comment. American Economic Review, 86(1), 300-309.

Zakrajsek, E. (1997). Retail Inventories, Internal Finance, and Aggregate Fluctuations: Evidence from US Firm-Level Data. Research Paper No. 9722, Federal Reserve Bank of New York, July 1997