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Cash Flow Trends and Their Fundamental Drivers: Comprehensive Review (Quarter 4, 2019)

Free Cash Margin Index:

0.99%, 3.45%	**4.34%**	**6.88%**
Recession Lows	**Current**	**Recent High**
(Dec 2000, Dec 2008)	**(Dec 2019)**	**(Dec 2009)**

Median free cash margin increased 48 basis points ("bps") to 4.34% for the twelve months ending December 2019 versus 3.86% for the twelve months ending September 2019. On a year-over-year basis, free cash margin was relatively flat, compared to 4.39% in December 2018. Median revenues have stayed relatively flat compared to September 2019, with a decrease of 1% to $1,170.95 million in the current period from $1,182.61 million in September 2019. Revenues decreased 6.2% year-over-year, down from $1,248.26 million in December 2018.

The median operating cushion fell 67 bps to 13.37% in December 2019 compared to 14.04% in September 2019 and fell 163 bps from 15.00% in December 2018. Gross margin increased to 37.72% in December 2019, up 50 bps from 37.22% in September 2019 and up 30 bps from 37.42% in December 2018. SG&A spending as a percentage of revenue increased to 18.00% in December 2019, up 31 bps from 17.69% in September 2019 and up 171 bps from 16.29% in December 2018.

Median capital expenditures as a percentage of revenues stayed relatively flat at 3.70% in December 2019, compared to 3.68% in September 2019, and dropped slightly from 3.79% in December 2018.

On a quarter over quarter basis, an increase in gross margin and improvement in cash efficiency drove this period's rise in free cash margin. The median gross margin improved 50 bps to 37.72% in December 2019 versus 37.22% in September 2019. Receivables days decreased 0.99 days to 53.47 days in December 2019, down from 54.46 days in September 2019.

On a year over year basis, the flat free cash margin can be attributed to offsetting effects of the decrease in capital expenditures as a percentage of sales and declines in operating cushion and cash efficiency. The cash cycle increased to 52.06 days in December 2019 versus 47.77 days in December 2018. The increase was primary driven by an increase in inventory days, which rose to 23.85 days in December 3019, compared to 20.60 days in December 2018.

Data for this research were provided by the Wharton Research Data Services database. **February 2020**

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Georgia Tech Financial Analysis Lab

The Georgia Tech Financial Analysis Lab conducts research on issues of financial reporting and analysis. Unbiased information is vital to effective investment decision-making. Accordingly, the Lab thinks that independent research organizations, such as this Lab, have an important role to play in providing information to market participants.

Because the Lab is housed within a university, all of its research reports have an educational quality, as they are designed to impart knowledge and understanding to those who read them. Its focus is on issues that it believes will be of interest to a large segment of stock market participants. Depending on the issue, it may focus its attention on individual companies, groups of companies, or on large segments of the market at large.

A recurring theme in the work is the identification of reporting practices that give investors a misleading signal, whether positive or negative, of corporate earning power. The Labs defines earning power as the ability to generate a sustainable stream of earnings that is backed by cash flow. Accordingly, its research may look into reporting practices that affect either earnings or cash flow, or both. At times, its research may look at stock prices generally, though from a fundamental and not technical point of view.

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Cash Flow Trends and Their Fundamental Drivers:
Comprehensive Industry Review (Quarter 4, 2019)

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Free Cash Margin Index*:

0.99%, 3.45%	4.34%	6.88%
Recession Lows (Dec 2000, Dec 2008)	**Current** (Dec 2019)	**Recent High** (Dec 2009)

The ***Free Cash Margin Index** is free cash flow measured as a percentage of revenue for the trailing twelve-month period.

Introduction

This research report is part of a continuing series that examines cash flow trends and the underlying drivers that are causing changes in those trends. The current study contains a review of the cash flow performance of all non-financial companies for a series of rolling twelve-month periods from the first quarter of 2000 through the fourth quarter of 2019. Additionally, it looks at individual industry results and focuses its attention on the drivers that pushed free cash margin higher or lower in those industries. All companies with total assets of $100 million or more are included, resulting in a total sample of 2,643 companies. Please see pages 5 and 6 for a list of industries included. That list is followed by a summary of the findings.

Measured as free cash flow divided by revenue, free cash margin is a cash flow profit margin. It indicates what percent of revenue is left for shareholders in the form of free and discretionary cash flow. If the company sells its products or services for a dollar, free cash margin tells how many cents the shareholders can take home without reducing the company's ability to generate more. Thus, as the report looks at cash flow trends and their underlying drivers, its particular interest is on how those factors impact free cash margin.

Continuous Focus on Cash Flow

Corporate financial success is dependent not only on a company's ability to generate revenues and earnings, but also cash flow, especially free cash flow. It is free cash flow and growth in free cash flow, that discretionary stream of cash that a company can put to use for acquisitions, debt retirement, dividends and stock buybacks that works with growing earnings to drive firm value higher. Because it is "free," free cash flow comes with no strings attached. It is truly discretionary. Spending it does not impact the company's ability to generate more. A company with revenue growth will eventually lose the favor of investors if it never finds a way to generate earnings. In a similar way, a company with profits that is unable to generate cash will also experience waning investor enthusiasm. It may take a while. Investors are patient with profitable, growing companies. Ultimately, however, a company must show an ability to generate free cash flow.

Companies that consume cash must continually seek new sources of capital – whether debt or equity. At some point, those sources of capital will dry up or become prohibitively expensive if the firm does not show at least some progress toward getting closer to positive cash generation. Worse, if cash flow does not back a company's earnings, ultimately those earnings themselves may become suspect, necessitating write-downs of the resulting non-cash assets. Net losses will likely accompany those write-downs.

When free cash margin is positive, a firm is covering all ongoing claims and is able to pay dividends, reduce debt or simply add to its cash coffers. When free cash margin turns negative, ongoing claims are not being met. Cash and short-term investments can be used to meet the shortfall. However, on-hand cash and short-term investments are not an unlimited source of funds. Firms can borrow money to meet their needs. However, even if this were an option, increasing debt levels add new, unwanted risks. Equity issues provide another avenue, but capital markets can be painfully dilutive when share prices are depressed for firms that are seemingly unable to generate cash.

During periods of growth, firms may have problems generating cash as profits are consumed with growth-related investments in working capital and property, plant and equipment needed to support that growth. During recessions, cash generation can be particularly problematic as revenues and profits decline, draining the economic engine that supports cash generation. Regardless of the economic environment, however, free cash margin serves as an important measure of long-term financial health for individual companies, industries and the economy as a whole. The Lab thinks that by periodically examining their cash generating ability, readers will gain insight into the overall financial health of important segments of U.S. firms. With all "nonfinancial firm industry" data dating back to 2000, it is possible to see how the cash-generating performance of these firms presently compares with their performance during previous periods of economic contraction (e.g., 2001 and 2008-2009) and economic expansion.

Cash Flow Definitions

Free cash flow is the cash flow equivalent of the income statement "bottom line". Like net income, free cash flow is available for shareholders after all prior claims have been satisfied. However, also like net income, which, to facilitate analysis, can be divided into certain sub-measures of performance, like gross profit and operating profit, free cash flow can be similarly divided. Thus, while the primary focus of the report is on free cash flow and free cash margin, or free cash flow as a percentage of revenue, it analyzes the fundamental drivers underlying two distinct, but also closely related, measures of cash flow:

1) Operating cash flow and operating cash margin - cash flow from operations after interest charges and income taxes. Operating cash margin is operating cash flow divided by revenue.

2) Free cash flow and free cash margin - cash flow available for common shareholders that can be used for such discretionary purposes as stock buybacks and dividends without affecting the firm's ability to grow and generate more. This measure is calculated as operating cash flow less preferred dividends and net capital expenditures. Free cash margin is free cash flow divided by revenue.

Data and Methodology

The data is provided by Compustat through a license with the Wharton Research Data Services. As noted, each data amount is for a rolling twelve-month period ending with the quarter end in question. For example, cash flow amounts for December 30, 2019 represent amounts for the twelve months (four quarters) ended December 30, 2019.

The 20 analyzed industry groups are as follows:

GICS	Industry Group
1010	Energy
1510	Materials
2010	Capital Goods
2020	Commercial & Professional Services
2030	Transportation
2510	Automobiles & Components
2520	Consumer Durables & Apparel
2530	Consumer Services
2550	Retailing
3010	Food & Staples Retailing
3020	Food, Beverage, & Tobacco
3030	Household & Personal Products
3510	Health Care Equipment & Services
3520	Pharmaceuticals, Biotech, & Life Sciences
4510	Software & Services
4520	Technology Hardware & Equipment
4530	Semiconductors & Equipment
5010	Telecommunication Services
5020	Media
5510	Utilities

The 20 industry groups use the four-digit Global Industrial Classification System (GICS) and represent 10 overall sectors. The ten sectors with industry groups included in parentheses are: Energy (Energy), Materials (Materials), Industrials (Capital Goods, Commercial & Professional Services, and Transportation), Consumer Discretionary (Automobiles & Components, Consumer Durables & Apparel, Consumer Services, Media and Retailing), Consumer Stapes (Food & Staples Retailing, Food, Beverage & Tobacco and Household & Personal Products), Health Care (Health Care Equipment & Services and Pharmaceuticals, Biotech & Life Sciences), Information Technology (Software & Services, Technology Hardware & Equipment and Semiconductors & Equipment), Telecommunications (Telecommunication Services) and Utilities (Utilities).

Summary of Results for All Non-Financial Companies

Median free cash margin slightly increased to 4.34% for the twelve months ending December 2019, compared to 3.86% for the twelve months ending September 2019 but was relatively flat compared to 4.39% in December 2018.

Factors impacting the quarter-over-quarter increase in free cash margin were gross margin, which increased to 37.72% during the twelve months ending December 2019 from 37.22% in September 2019 and 37.42% in December 2018. Operating cushion, or operating profit before depreciation, decreased to 13.37% during the twelve months ending December 2019 from 14.04% in September 2019 and 15.00% in December 2018, driven by rising SG&A costs. We also saw an overall increase in the cash cycle to 52.06 days in December 2019, from 51.82 days in September 2019 and 47.77 in December 2018, but an improvement in accounts receivable days from September to December served to increase operating cash flow and free cash margin. Capital spending as a percentage of revenue increased slightly from September to December but decreased compared to December 2018, from 3.79% to 3.70% . The decrease in capital spending offset the larger decrease in operating cushion to keep free cash margin flat on a year-over-year basis.

Median revenues have decreased to $1,170.95 million in the current period from $1,182.61 million in September 2019 and $1,248.26 million in December 2018.

Drivers of Free Cash Margin

The drivers of improvements or declines in free cash margin consist of factors that impact profitability and efficiency. On the profitability front, operating cushion measures operating profit, exclusive of the non-cash expenses, depreciation and amortization. Factors impacting operating cushion consist of gross margin (excluding depreciation and amortization), and SG&A% (excluding depreciation and amortization). Also impacting profitability and a firm's ability to generate free cash flow, but excluded from operating cushion, is income taxes paid, which is measured as a percent of revenue.

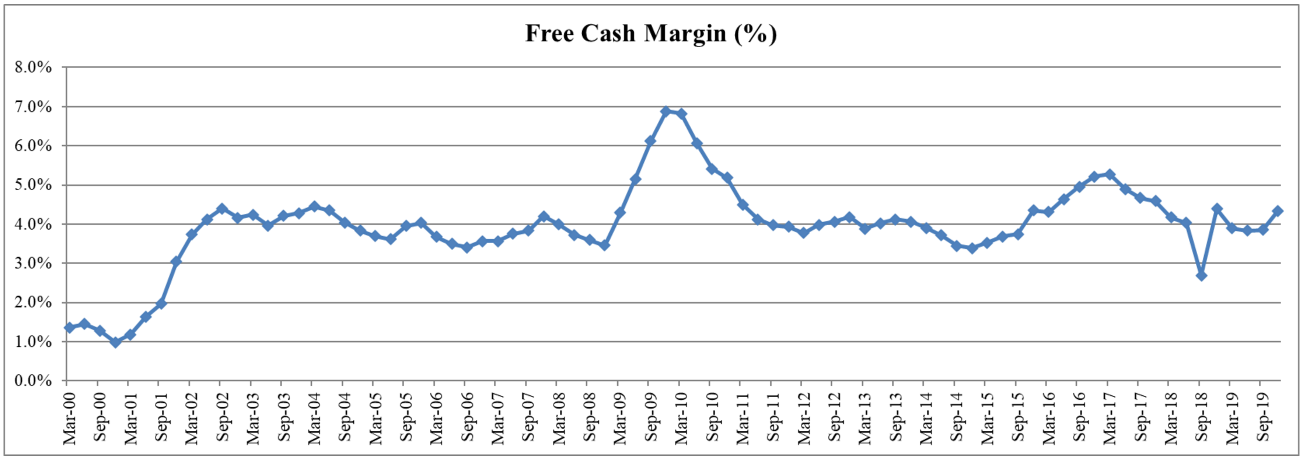
Capital expenditures do not impact profitability directly, but through depreciation on fixed asset additions. However, these expenditures are subtracted in computing free cash flow. It is also important to look at capital expenditures because these are investments in fixed assets that will likely improve a company's ability to generate revenue, and subsequent profit, in the future. Like operating expenses and taxes, capital expenditures are measured as a percent of revenue.

On the efficiency front, increases in receivables and inventory consume free cash flow. Increases in accounts payable provide free cash flow. The combination of receivables days plus inventory days less payables days is a firm's cash cycle. Reductions in the cash cycle provide free cash flow, while increases in the cash cycle consume free cash flow. All of these factors are evaluated when analyzing changes in free cash margin for the standout firms discussed in this section.

ALL NON-FINANCIAL INDUSTRIES	Q4 2019 (Dec 2019)	Q3 2019 (Sep 2019)	Q4 2018 (Dec 2018)	Effect on FCM (Q4 2019 vs. Q4 2018)
Revenue (millions)	**$1,170.95**	**$1,182.61**	**$1,248.26**	**DOWN 6.2%**
Free Cash Flow (millions)	**$44.62**	**$36.15**	**$47.35**	**DOWN 5.8%**
Free Cash Margin	**4.34%**	**3.86%**	**4.39%**	**DOWN 5 bps**
Operating Cushion %	13.37%	14.04%	15.00%	Driving **DOWN**
Gross Margin % (before depreciation)	37.72%	37.22%	37.42%	Driving **UP**
SGA% (before depreciation)	18.00%	17.69%	16.29%	Driving **UP**
Cash Cycle (rev days)	52.06	51.82	47.77	Driving **UP**
Accounts Receivable (rev days)	53.47	54.46	52.97	Driving **UP**
Inventory (rev days)	23.85	23.51	20.60	Driving **UP**
Accounts Payable (rev days)	25.26	26.14	25.81	Driving **DOWN**
Income tax to Rev %	0.93%	0.95%	0.96%	Driving **DOWN**
Cap Exp. to Rev %	3.70%	3.68%	3.79%	Driving **DOWN**

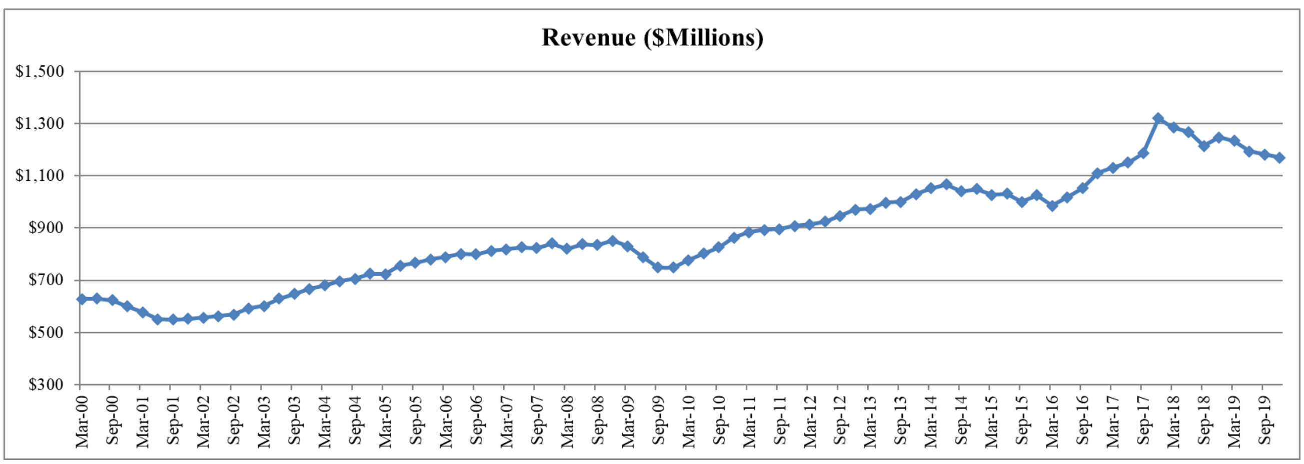
In the exhibits below we present graphs of free cash margin and several of its underlying drivers. These exhibits were constructed with data from the complete sample of 2,643 non-financial companies. For more details on each of the 20 individual industry groups included, please refer to the individual industry spreadsheets and supporting charts that are available on our website (www.scheller.gatech.edu/finlab).

All Non-financials, Q1 2000 – Q4 2019



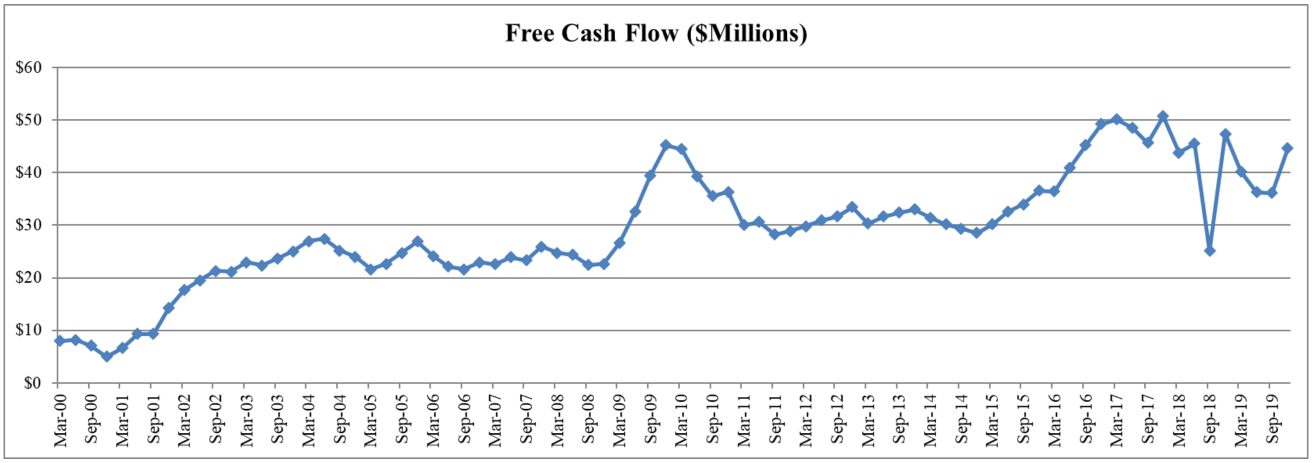
Free cash margin has increased to 4.34% in December 2019 from 3.86% in the previous quarter ending September 2019 and has remained relatively flat compared to 4.39% in December 2018.

All Non-financials, Q1 2000 – Q4 2019



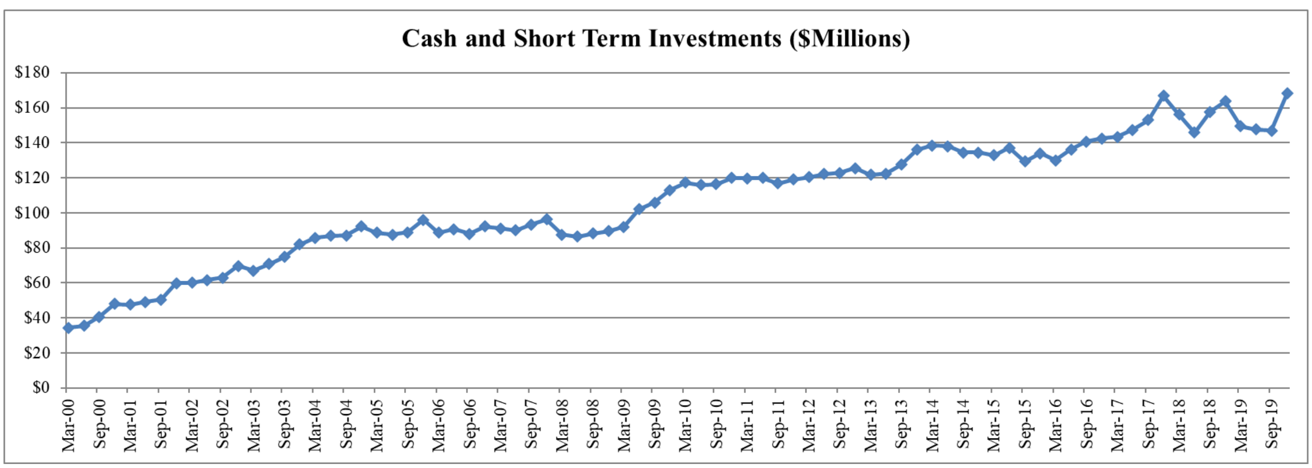
Median revenues decreased to $1,170.95 million in the current period from $1,182.61 million in September 2019 and $1,248.26 in December 2018.

All Non-financials, Q1 2000 – Q4 2019



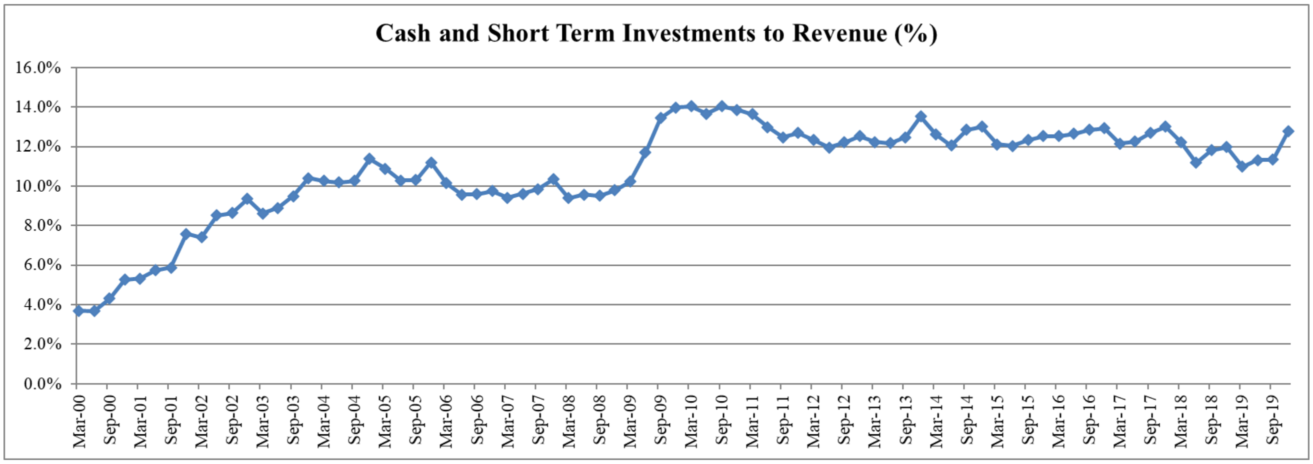
Median free cash flow increased to $44.62 million in the current quarter from $36.15 million in September 2019.

All Non-financials, Q1 2000 – Q4 2019



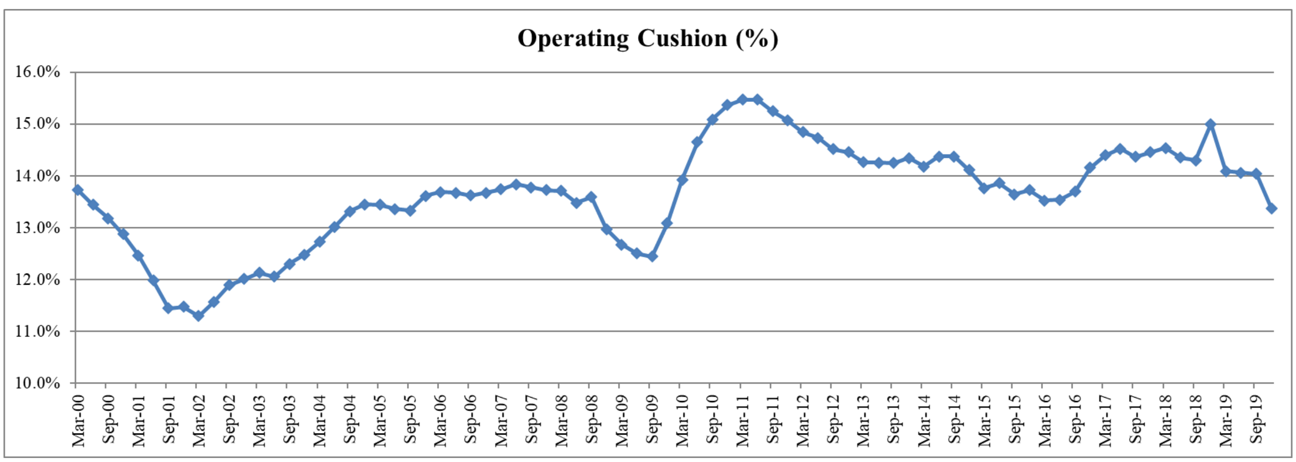
Median cash and short-term investments increased to $168.18 million in December 2019 from $147.00 million in September 2019.

All Non-financials, Q1 2000 – Q4 2019



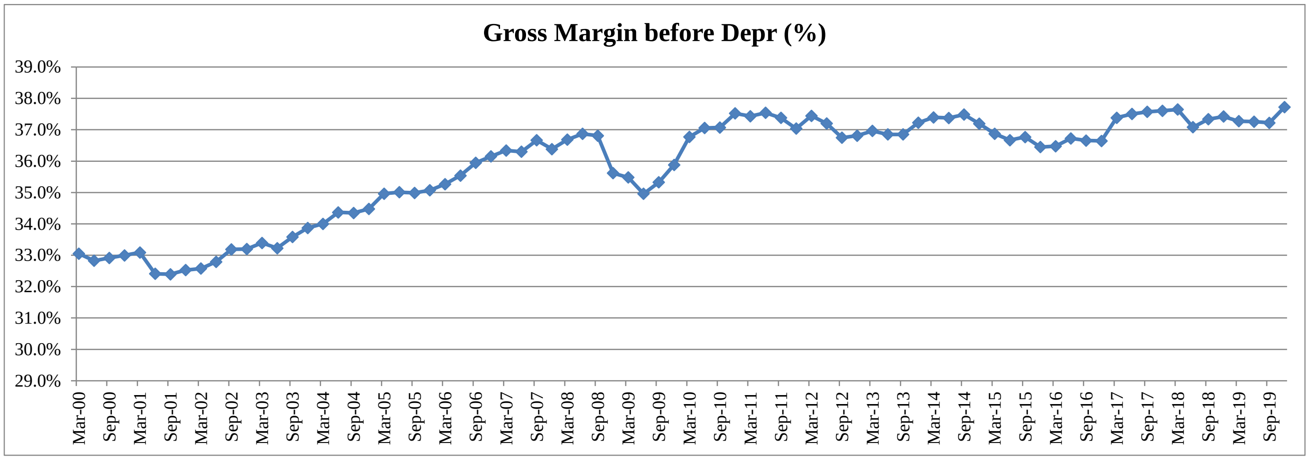
Cash and short-term investments to revenue increased to 12.78% in December 2019 from 11.35% in September 2019.

All Non-financials, Q1 2000 – Q4 2019



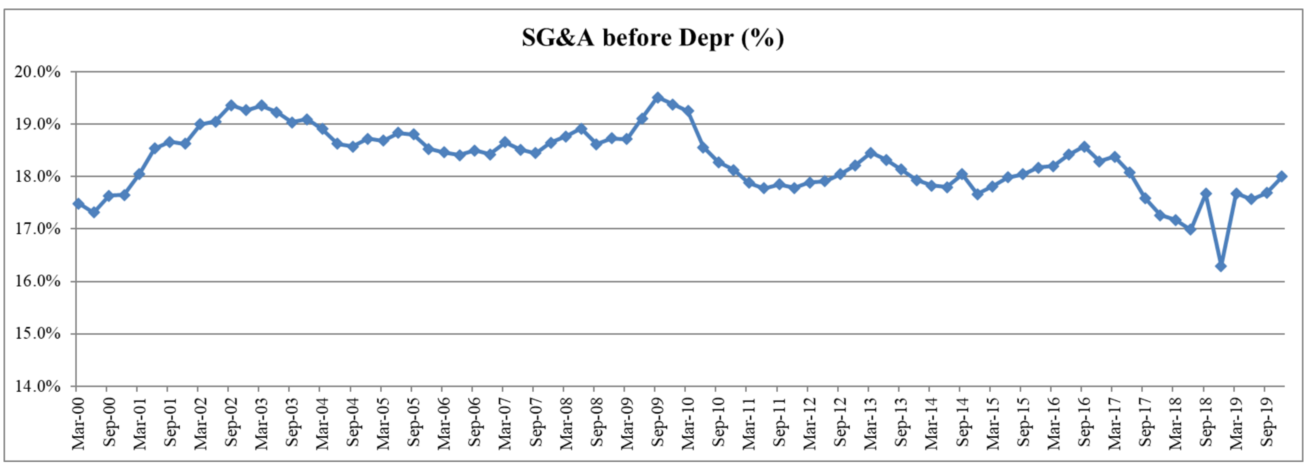
Median operating cushion decreased to 13.37% in the current reporting period from 14.04% in the reporting period ending September 2019 and 15.00% in December 2019. The decline was driven largely by an increase in SGA%.

All Non-financials, Q1 2000 – Q4 2019



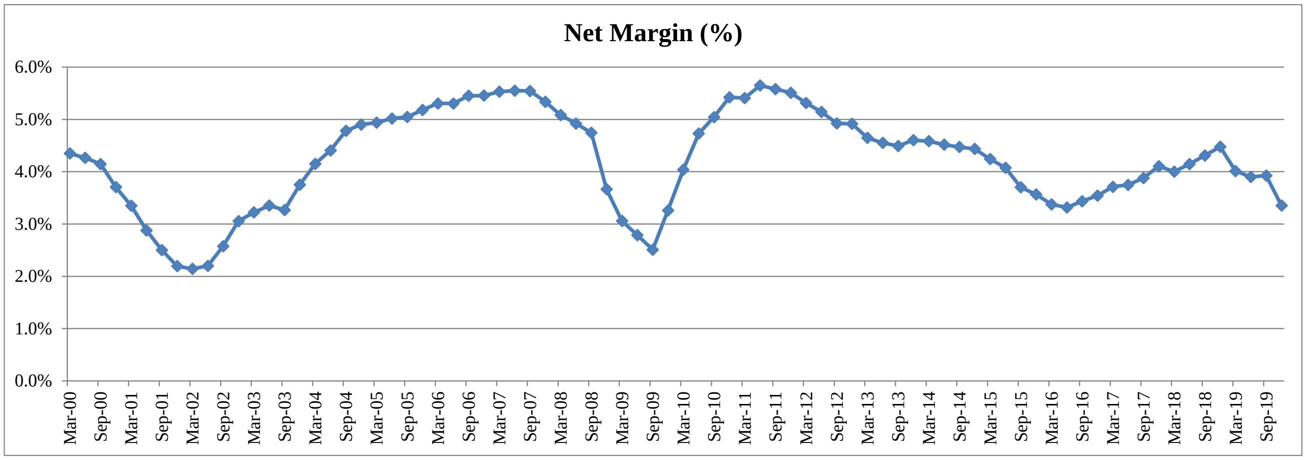
Median gross margin before depreciation increased to 37.72% for the twelve months ending December 2019 compared to 37.22% for the twelve months ending September 2019 and 37.42% for December 2018.

All Non-financials, Q1 2000 – Q4 2019



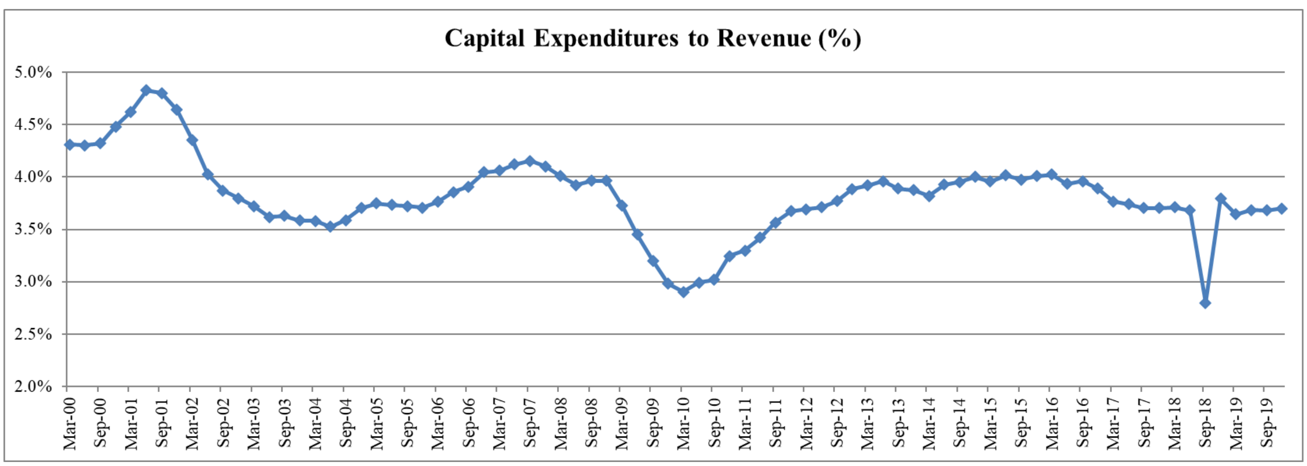
Median selling, general, and administrative expense (before depreciation) as a percent of revenue increased to 18.00% in December 2019, up from 17.69% in September 2019.

All Non-financials, Q1 2000 – Q4 2019



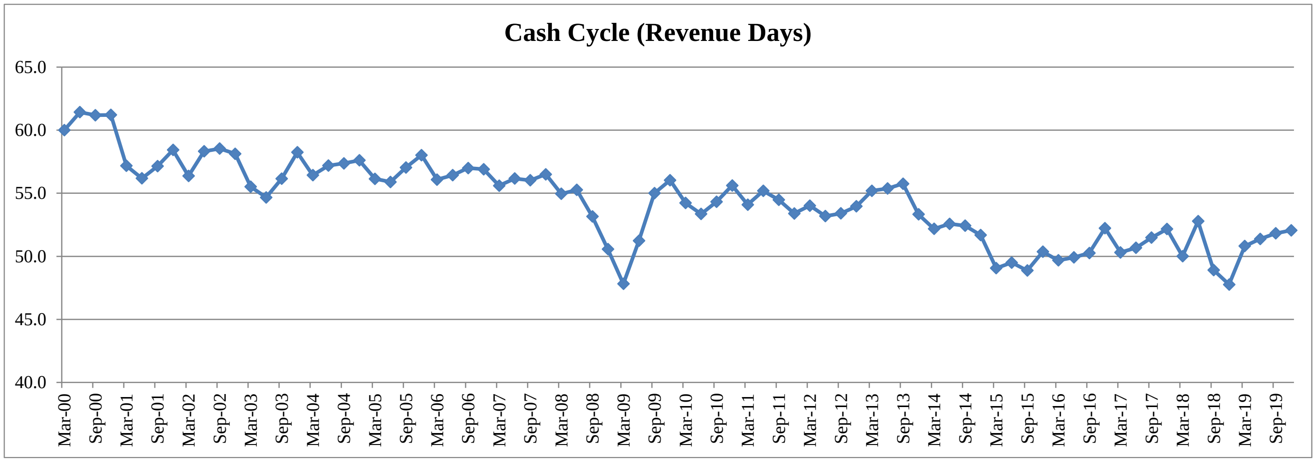
Median net margin decreased to 3.35% in December 2019 period, down from 3.93% for the September 2019 period.

All Non-financials, Q1 2000 – Q4 2019



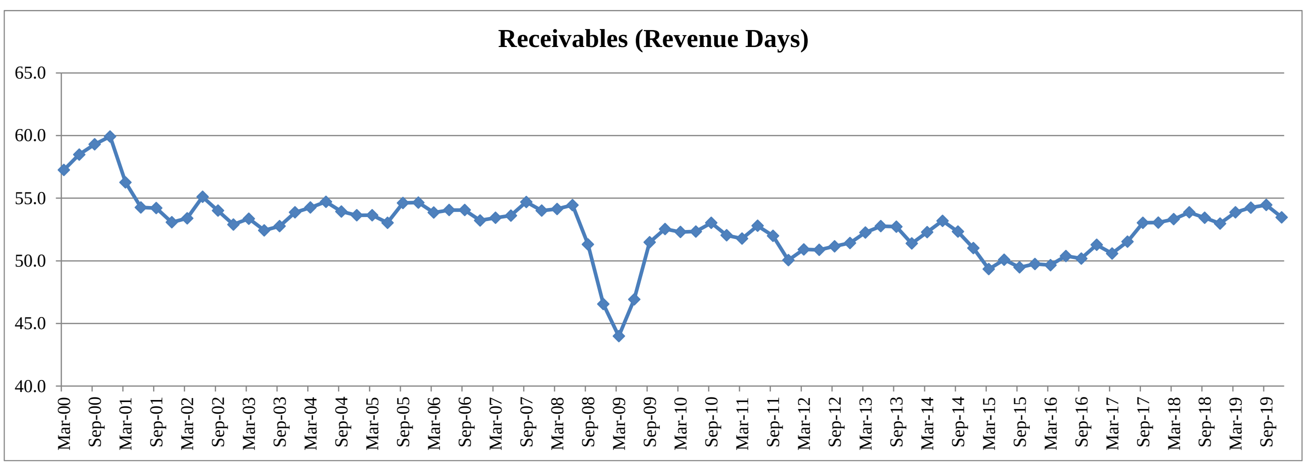
Capital expenditures as a percentage of revenue increased to 3.70% in the December 2019 reporting period, up from 3.68% in September 2019, but decreased from 3.79% in December 2018

All Non-financials, Q1 2000 – Q4 2019



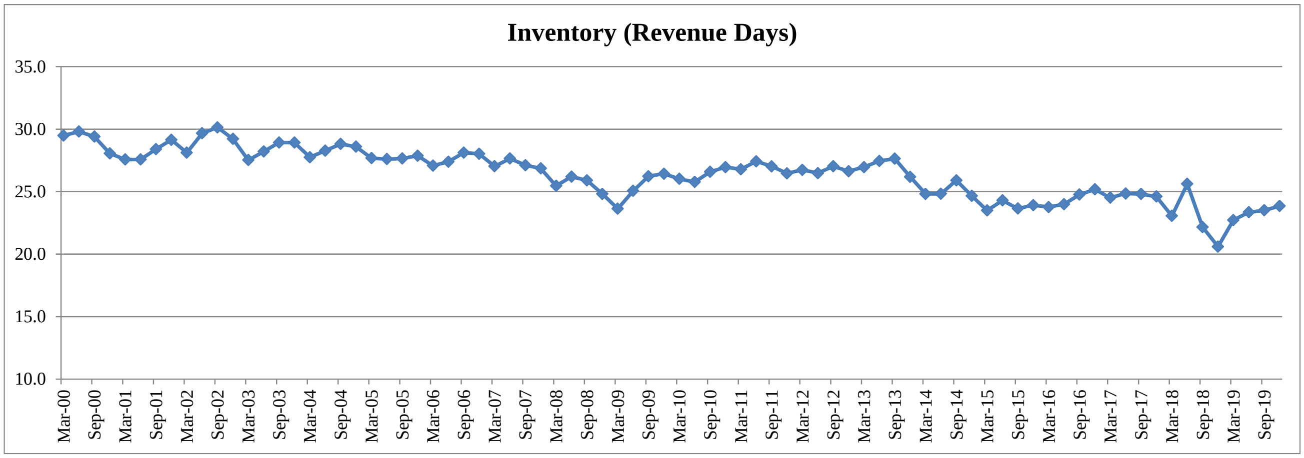
The cash cycle measures the proportion of operating cash flow carried in working capital and is measured by receivables days plus inventory days less payables days. The metric increased to 52.06 days for the period ending December 2019 compared to 51.82 days for the period ending September 2019. The increase was driven by an increase in inventory days and a decrease in payable days, which offset a decrease in accounts receivables days.

All Non-financials, Q1 2000 – Q4 2019



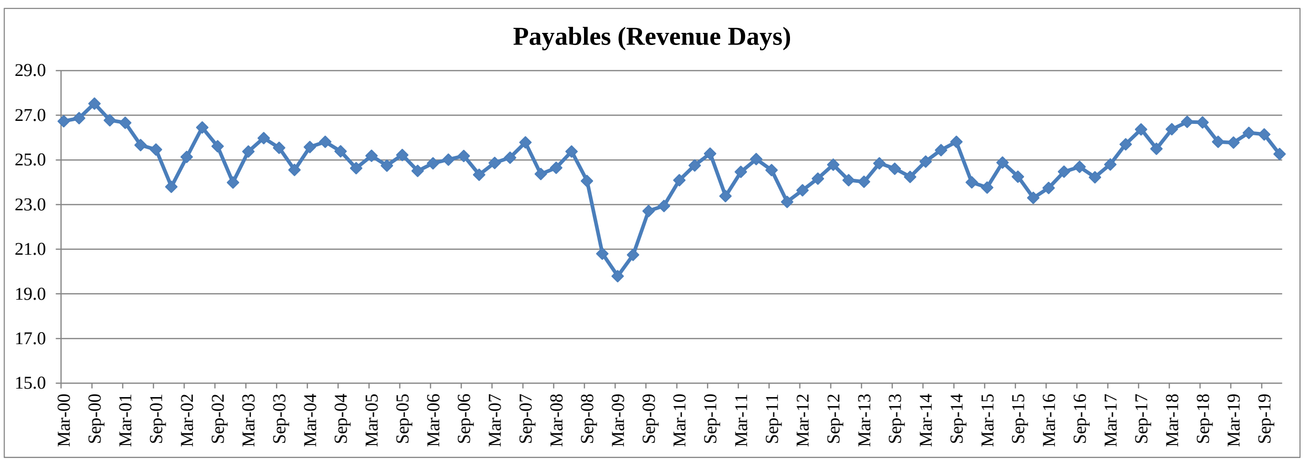
Median accounts receivable days decreased to 53.47 days in the December 2019 reporting period from 54.46 days in the September 2019 reporting period and increased from 52.97 days in December 2018.

All Non-financials, Q1 2000 – Q4 2019



Median inventory days increased to 23.85 days in December 2019 from 23.51 days in September 2019.

All Non-financials, Q1 2000 – Q4 2019



Accounts payable days declined to 25.26 days in December 2019 from 26.14 days in September 2019.

Individual Industry Results

During the twelve months ended December 2019, recent industry trends evidenced a moderate to substantial improvement in free cash margin in **15** industries compared to the twelve months ended September 2019, and a declining free cash margin in **5** industries. Compared to the twelve months ended December 2018, 10 industries reported an improvement in free cash margin and 10 reported declining free cash margin.

Please refer to the individual industry spreadsheets, available on our website, for charts and further details on each of the 20 industry groups outlined in the following tables.

Industry Trends in Free Cash Margin

GICS	Industry Group	Q4 2019	vs Q3 2019	vs Q4 2018
1010	Energy	3.39%	UP 246 bps	UP 321 bps
1510	Materials	5.85%	UP 167 bps	UP 73 bps
2010	Capital Goods	5.15%	UP 72 bps	UP 75 bps
2020	Commercial & Prof Services	6.24%	UP 120 bps	UP 20 bps
2030	Transportation	3.15%	DOWN 90 bps	UP 29 bps
2510	Automobiles & Components	2.45%	UP 52 bps	DOWN 83 bps
2520	Consumer Durables & Apparel	5.30%	UP 68 bps	UP 77 bps
2530	Consumer Services	5.65%	UP 114 bps	UP 137 bps
2550	Retailing	3.09%	UP 10 bps	DOWN 28 bps
3010	Food & Staples Retailing	1.24%	DOWN 31 bps	DOWN 26 bps
3020	Food, Beverage, & Tobacco	6.40%	DOWN 53 bps	UP 160 bps
3030	Household & Personal Products	8.06%	UP 81 bps	DOWN 326 bps
3510	Health Care Equipment & Services	4.71%	UP 67 bps	DOWN 73 bps
3520	Pharmaceuticals, Biotech, & Life Sciences	-77.49%	DOWN 1592 bps	DOWN 2032 bps
4510	Software & Services	9.16%	UP 27 bps	DOWN 213 bps
4520	Technology Hardware & Equipment	4.25%	UP 120 bps	DOWN 56 bps
4530	Semiconductors & Equipment	10.31%	UP 32 bps	DOWN 58 bps
5010	Telecommunication Services	6.68%	UP 120 bps	UP 189 bps
5020	Media	7.01%	UP 101 bps	UP 107 bps
5510	Utilities	-2.83%	DOWN 59 bps	DOWN 275 bps
	Total	**4.34%**	**15 (5)**	**10 (10)**

The following table compares Free Cash Margin for the 20 industry groups in the period ending December 2019 (Q4 2019) with the December 2018 and September 2019 reporting periods.

GICS	Sector/Industry Group	Q4 2019	Q3 2019	Q4 2018
1010	Energy	3.39%	0.93%	0.18%
1510	Materials	5.85%	4.18%	5.12%
2010	Capital Goods	5.15%	4.43%	4.40%
2020	Commercial & Prof Services	6.24%	5.04%	6.04%
2030	Transportation	3.15%	4.05%	2.86%
2510	Automobiles & Components	2.45%	1.93%	3.28%
2520	Consumer Durables & Apparel	5.30%	4.62%	4.53%
2530	Consumer Services	5.65%	4.51%	4.28%
2550	Retailing	3.09%	2.99%	3.37%
3010	Food & Staples Retailing	1.24%	1.55%	1.50%
3020	Food, Beverage, & Tobacco	6.40%	6.93%	4.80%
3030	Household & Personal Products	8.06%	7.25%	11.32%
3510	Health Care Equipment & Services	4.71%	4.04%	5.44%
3520	Pharmaceuticals, Biotech, & Life Sciences	-77.49%	-61.57%	-57.17%
4510	Software & Services	9.16%	8.89%	11.29%
4520	Technology Hardware & Equipment	4.25%	3.05%	4.81%
4530	Semiconductors & Equipment	10.31%	9.99%	10.89%
5010	Telecommunication Services	6.68%	5.48%	4.79%
5020	Media	7.01%	6.00%	5.94%
5510	Utilities	-2.83%	-2.24%	-0.08%
	All Industries Median	**4.34%**	**3.86%**	**4.39%**

Conclusions

The cash flow data reported through the fourth quarter of 2019 provides us with new insight into the U.S. economy. The ratios suggest a slight economic upturn with improving gross margins, and upward free cash margin trends and decreasing income tax as a % of revenue.

Median free cash margin increased during the December 2019 reporting period from the previous quarter and was flat on a year-over-year basis. Median revenues have decreased to 1,170.95 million in the current period from $1,182.61 million in September 2019 and $1,248.26 million in December 2018. Cash and short-term investments are up from the previous quarter and year-over-year.

The tax reform legislation passed in 2017 targeted increased business investment to spur economic growth. We witnessed that the desired result began to materialize in 2018, as median capital expenditures as a percentage of revenue increased in the four quarters ending December 2018 after falling for three consecutive quarters. Median capital expenditures as a percentage of revenue increased to 3.70% in the December 2019 period compared to 3.68% of revenue in the September 2019 period and 3.79% in the December 2018 period. Capital spending is still in a slight slump, as revenues decline, and the percentage of revenues devoted to capital expenditures has marginally increased during 2019. It appears that uncertainty surrounding tariffs and the threat of Covid-19 is hurting business confidence and, in turn, capital spending.

Dividends and stock repurchase decreased for the four consecutive quarters to 1.91% in the current quarter from 1.96% in September 2019 and 2.15% in December 2018.

We are in the late stages of the current economic expansion. After seeing declining margins during 2019, which is typical at this stage of an expansion, we are seeing improving gross margins. As noted earlier, during this reporting period we saw a continued decrease in operating cushion (reflecting deteriorating operating margins), driven by an increase in SG&A expense as a percentage of revenue. An increasing gross margin with declining revenues suggests that companies may be discounting less than in prior periods and are working to reduce COGS. The fall in receivables days and increase in operating cash margin suggests that companies are more cash efficient than they have been in prior reporting periods.

While we are seeing some improvements, the effects of uncertainties that have accompanied the tariff battles and COVID-19 remain to be seen. We will continue to watch and report.