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# Cash Flow Trends and Their Fundamental Drivers: Comprehensive Review (Quarter 4, 2016)

#### Free Cash Margin Index:

 0.99%, 3.45%
 5.12%
 6.88%

 Recession Lows
 Current
 Recent High

 (Dec. 2000, Dec. 2008)
 (Dec. 2016)
 (Dec. 2009)

Median free cash margin increased to 5.21% for the twelve months ended December 2016, compared with 4.96% for the twelve months ended September 2016 and 4.35% in December 2015. This metric has now reached a post-recession high. Helping to drive free cash margin higher, operating cushion, or operating profit before depreciation, improved to 14.16% during the twelve months ended December 2016 from 13.72% in 2015. Stable gross margins, along with declining SG&A and capital expenditures contributed to the improvement in operating cushion. This improvement helped to offset an increase in the cash cycle, which rose to 52.23 days in December 2016, up from 50.37 days in 2015. The primary drivers for this change were increases in accounts receivable days and inventory days, as well as falling accounts payable days.

Top line revenue reached an all-time high during this reporting period. Median revenues increased to \$1,110.19 million in December 2016, up to 8.2% year-over-year from \$1,025.88 in 2015. However, this revenue growth did not translate into increased capital expenditure investments, which declined from 4.01% of revenue in December 2015 to 3.89% in 2016. This softness in capital expenditures is not consistent with a robust economy, but it could possibly improve with tax reform. Overall, cash flow data for the twelve months ending with the fourth quarter of 2016 suggest an economy that continues to improve, but still lacks enough stability to attract long-term capital investments.

Looking at individual industries for the reporting period ending December 2016, free cash margin was stable in five industry groups, higher in twelve, and lower in three.

Data for this research were provided by S&P's Capital IQ's Compustat database.

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# Georgia Tech Financial Analysis Lab Scheller College of Business Georgia Institute of Technology Atlanta, GA 30332-0520

#### 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, 2016)

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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 2016. 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 2,595 companies. Please see page 7 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.

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#### **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 "non-financial 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:

- 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 31, 2016 represent amounts for the twelve months (four quarters) ended December 31, 2016.

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
2540	Media
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
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 showed additional improvement this quarter. It rose to 5.12% for the twelve months ended December 2016, up from 4.96% for the twelve months ended September 2016 and 4.35% for the twelve months ended December 2015. The primary contributor to the increase in free cash margin was an increase in operating cushion, or operating profit before depreciation, which improved to 14.16% during the twelve months ended December 2016, up from 13.72% during the same period in 2015. A marginal decline in income taxes and capital expenditures also boosted free cash margin. Offsetting the improvement in free cash margin was an increase in the cash cycle. For the period ended December 2016, the cash cycle increased to 52.29 days, up from 50.37 days in 2015, driven higher by increases in accounts receivable days and inventory days, less an increase in accounts payable days.

Providing evidence of an expanding economy, median revenues continued to increase during the December 2016 reporting period. Median revenues rose to \$1,110.19 million during the twelve months ended December 2016, up 8.22% from \$1,025.88 in 2015. The metric reached a new all-time high as it surpassed the prior record of \$1,066.79 million from June 2014.

#### **Drivers of Free Cash Margin**

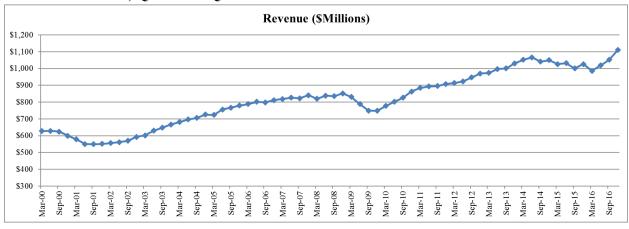
	Q4 2016	Q3 2016	Q4 2015	Effect on FCM
ALL NON-FINANCIAL INDUSTRIES	(Dec 2016)	(Sept 2016)	(Dec 2015)	(Q4 2016 vs. Q4 2015)
Revenue (millions)	1,110.19	1,052.29	1,025.88	UP 8.22%
Free Cash Flow (millions)	49.20	45.19	36.55	<b>UP 34.61%</b>
Free Cash Margin	5.12%	4.96%	4.35%	<b>UP 17.70%</b>
Operating Cushion %	14.16%	13.70%	13.72%	Driving <b>UP</b>
Gross Margin % (before depreciations)	36.65%	36.66%	36.45%	Driving <b>UP</b>
SGA% (before depreciation)	18.29%	18.57%	18.17%	Driving <b>DOWN</b>
Cash Cycle (rev days)	52.29	50.26	50.37	Driving <b>DOWN</b>
Accounts Receivable (rev days)	51.28	50.19	49.75	Driving <b>DOWN</b>
Inventory (rev days)	25.18	24.76	23.91	Driving <b>DOWN</b>
Accounts Payable (rev days)	24.23	24.69	23.30	Driving <b>UP</b>
Income tax to Rev %	1.33%	1.25%	1.50%	Driving <b>UP</b>
Cap Exp. to Rev %	3.89%	3.96%	4.01%	Driving UP

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 2,595 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).

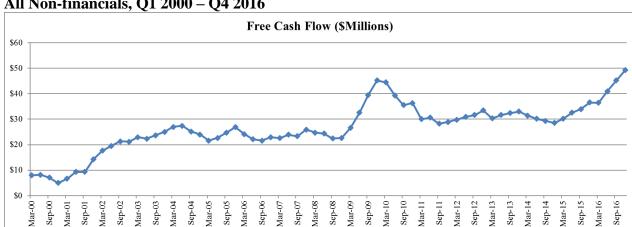


The metric now sits above the upper end of its historical range of between 3.00% and 4.50%. Helping to drive free cash margin higher, operating cushion, or operating profit before depreciation, improved to 14.16% during the twelve months ended December 2016 from 13.72% in 2015.

#### All Non-financials, Q1 2000 – Q4 2016



Median revenues continued to improve during the December 2016 reporting period, rising to \$1,110.19 million, up 8.2% from 2015. Median revenues surpassed the previous all-time high of \$1,066.79 recorded in June 2014.

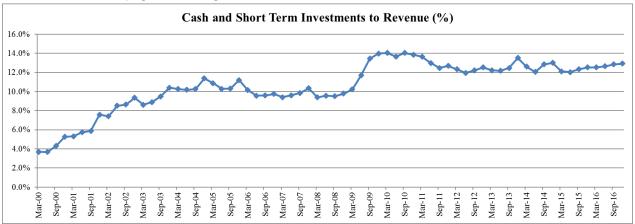


The increase in revenues and free cash margin led to an increase in free cash flow. Median free cash flow rose 34.6% to \$49.20 million for the twelve months ended December 2016, up from \$36.55 million in December 2015.



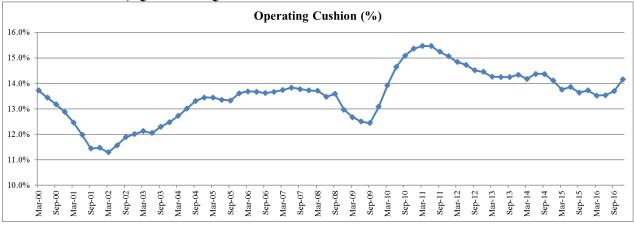


Median cash and short-term investments increased 1.40% to \$142.57 million at December 2016 from \$140.61 million at September 2016, and up 6.40% from \$134.00 million reported in December 2015.



Cash and short-term investments to revenue also increased, rising to 12.92% in December 2016, up from 12.85% in September 2016 and 12.54% in September 2015. Prior to the recession, cash and short-term investments were approximately 10% of revenue.

#### All Non-financials, Q1 2000 – Q4 2016

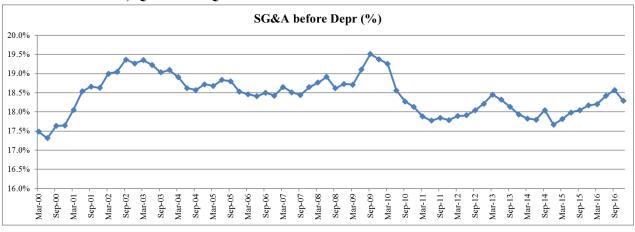


Median operating cushion increased to 14.16% in the reporting period ended December 2016, up from 13.70% in September 2016 and 13.72% in December 2015.

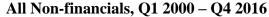


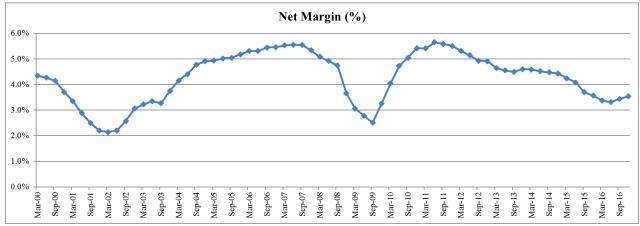
Median gross margin before depreciation held steady at 36.65% for the twelve months ended December 2016 versus 36.66% in September 2016 and 36.45% in September 2015.

#### All Non-financials, Q1 2000 - Q4 2016



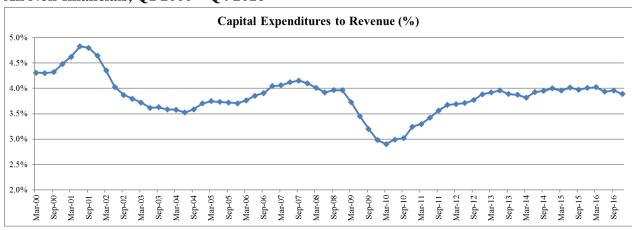
Median selling, general, and administrative expense (before depreciation) as a percent of revenue decreased from 18.57% in the September 2016 reporting period to 18.29% in December 2016. This was the first decline in SG&A since December 2014.



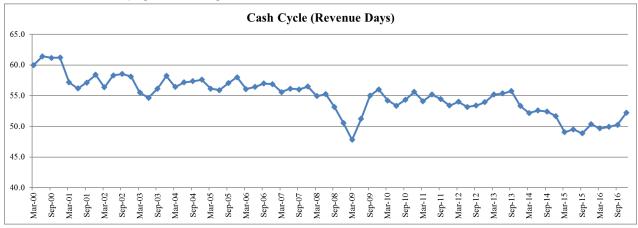


Median net margin increased marginally to 3.54% for the December 2016 period from 3.44% for the September 2016 reporting period, but was still slightly below the 3.56% reported in the December 2015 period.

## All Non-financials, Q1 2000 – Q4 2016

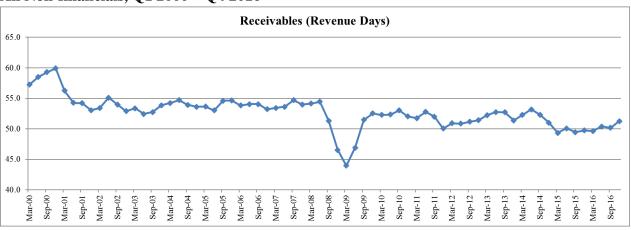


Capital expenditures as a percentage of revenue, at 3.89%, reflects a slight decline from the 3.96% recorded in September 2016 and 4.01% recorded in December 2015. This continued softness in capital expenditures is well-below the level of investment needed to replace capital expenditures lost during the recession.

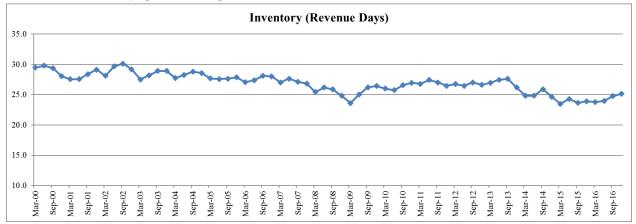


The cash cycle measures the proportion of operating cash flow carried in working capital and is measured by receivables days plus inventory days less payables days. The metric increased to 52.23 days for the period ended December 2016 from 50.26 days for the period ending September 2016 and 50.37 days for the period ended December 2015.

#### All Non-financials, Q1 2000 – Q4 2016

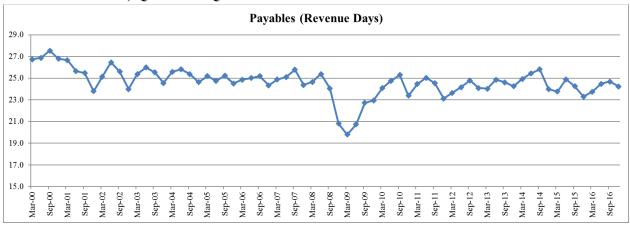


Median accounts receivable days increased to 51.28 days in the December 2016 reporting period from 50.19 days in September 2016, and is also above the 49.75 days seen in December 2015.



Median inventory days increased to 25.18 days in December 2016 from 24.76 days in September 2016 and 23.91 days in December 2015.

## All Non-financials, Q1 2000 - Q3 2016



Accounts payable days decreased to 24.23 days in the December 2016 reporting period from 24.69 in September 2016, but was above the 23.30 days in the period ending December 2015.

## **Individual Industry Results**

During the twelve months ended December 2016, recent industry trends evidenced a moderate to substantial <u>improvement</u> in free cash margin in <u>12</u> industries, relatively <u>stable</u> free cash margin in <u>5</u> industries, and a <u>declining</u> free cash margin in <u>3</u> industries.

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	Increasing	Stable	Declining
1010	Energy	X		
1510	Materials	X		
2010	Capital Goods		X	
2020	Commercial & Prof Services	X		
2030	Transportation		X	
2510	Automobiles & Components	X		
2520	Consumer Durables & Apparel	X		
2530	Consumer Services	X		
2540	Media	X		
2550	Retailing	X		
3010	Food & Staples Retailing		X	
3020	Food, Beverage, & Tobacco		X	
3030	Household & Personal Products		X	
3510	Health Care Equipment & Services	X		
3520	Pharmaceuticals, Biotech, & Life Sciences			X
4510	Software & Services	X		
4520	Technology Hardware & Equipment	X		
4530	Semiconductors & Equipment	X		
5010	Telecommunication Services			X
5510	Utilities			X
	Total	12	5	3

The following table compares Free Cash Margin for the 20 industry groups in the period ending December 2016 (Q4 2016) with the September 2016 and December 2015 reporting periods.

GICS	Sector/Industry Group	Q4 2016	Q3 2016	Q4 2015
1010	Energy	1.12%	0.09%	-0.06%
1510	Materials	5.89%	6.12%	5.29%
2010	Capital Goods	5.55%	5.55%	5.37%
2020	Commercial & Prof Services	7.77%	6.68%	5.49%
2030	Transportation	2.17%	1.60%	2.41%
2510	Automobiles & Components	3.76%	3.82%	3.23%
2520	Consumer Durables & Apparel	5.95%	5.51%	3.61%
2530	Consumer Services	5.62%	4.94%	4.48%
2540	Media	9.47%	7.76%	8.14%
2550	Retailing	4.39%	3.80%	2.47%
3010	Food & Staples Retailing	1.76%	1.13%	1.67%
3020	Food, Beverage, & Tobacco	6.22%	7.35%	6.63%
3030	Household & Personal Products	9.87%	9.76%	9.66%
3510	Health Care Equipment & Services	5.27%	6.19%	4.60%
3520	Pharmaceuticals, Biotech, & Life Sciences	-14.41%	-16.61%	-4.93%
4510	Software & Services	9.87%	9.76%	7.67%
4520	Technology Hardware & Equipment	5.77%	4.64%	4.32%
4530	Semiconductors & Equipment	10.45%	7.62%	5.89%
5010	Telecommunication Services	2.92%	4.22%	5.78%
5510	Utilities	0.09%	2.18%	1.18%
	All Industries Median	5.21%	4.96%	4.35%

#### The Standouts: A Closer Look

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.

Graphs of free cash margin for select industries studied in the reporting period are provided below. With each graph we provide a short summary of the primary drivers or factors that are behind the observed changes in free cash margin for the selected industries. For more details regarding the industries, please refer to the separate industry spreadsheets found on our website.

## **Industries with Declining Free Cash Margin**

In the twelve month period ended December 2016, three industries saw free cash margin decline: Pharmaceuticals, Biotech, & Life Sciences; Telecommunication Services; and Utilities. In the following paragraphs we take a closer look at an industry with declining free cash margin: Pharmaceuticals, Biotech, & Life Sciences.

#### Pharmaceuticals, Biotech, & Life Sciences, Q1 2006 – Q4 2016



#### **Drivers of Free Cash Margin**

	Q4 2016	Q3 2016	Q4 2015	Effect on FCM
Pharmaceuticals, Biotech, and Life Sciences	(Dec 2016)	(Sept 2016)	(Dec 2015)	(Q4 2016 vs. Q4 2015)
Revenue (millions)	81.03	86.17	83.54	DOWN 3.00%
Free Cash Flow (millions)	-35.39	-32.26	-20.75	<b>DOWN 70.55%</b>
Free Cash Margin	-14.41%	-16.61%	-4.93%	DOWN 192.29%
Operating Cushion %	-23.99%	-22.05%	-13.91%	Driving <b>DOWN</b>
Gross Margin % (before depreciations)	35.97%	36.96%	42.29%	Driving <b>DOWN</b>
SGA% (before depreciation)	19.43%	20.44%	19.80%	Driving UP
Cash Cycle (rev days)	61.74	47.03	49.11	Driving <b>DOWN</b>
Accounts Receivable (rev days)	70.36	58.78	63.39	Driving <b>DOWN</b>
Inventory (rev days)	17.99	19.87	18.34	Driving <b>UP</b>
Accounts Payable (rev days)	26.60	31.62	32.62	Driving <b>DOWN</b>
Income tax to Rev %	0.00%	0.00%	0.11%	Driving <b>UP</b>
Cap Exp. to Rev %	5.57%	5.16%	4.84%	Driving <b>DOWN</b>

#### **Analysis**

Free cash margin has trended downward for the Pharmaceuticals, Biotech, & Life Sciences industry ever since December 2012, although it may have bottomed out in December 2016. The decrease in free cash margin is primarily being driven by a declining operating cushion and falling gross margins. The industry has also seen a large jump in the cash cycle, due to increasing accounts receivable, and decreasing accounts payable.

#### **Industries with Improving Free Cash Margin**

In the twelve month period ended December 2016, twelve industries enjoyed improving free cash margin: Energy; Materials; Commercial & Prof Services; Automobiles & Components; Consumer Durables & Apparel; Consumer Services; Media; Retailing; Health Care Equipment & Services; Software & Services; Technology Hardware & Equipment; and Semiconductors & Equipment.

Here we look more closely at one of these: **Software & Services**.



#### **Software & Services, Q1 2006 – Q4 2016**

## **Drivers of Free Cash Margin**

	Q4 2016	Q3 2016	Q4 2015	Effect on FCM
Software & Services	(Dec 2016)	(Sept 2016)	(Dec 2015)	(Q4 2016 vs. Q4 2015)
Revenue (millions)	94.24	80.44	60.81	UP 54.97%
Free Cash Flow (millions)	59.02	52.72	44.73	UP 31.95%
Free Cash Margin	9.31%	8.97%	7.67%	<b>UP 21.38%</b>
Operating Cushion %	12.61%	12.32%	12.70%	Driving <b>DOWN</b>
Gross Margin % (before depreciations)	61.32%	62.65%	62.73%	Driving <b>DOWN</b>
SGA% (before depreciation)	45.38%	45.99%	46.17%	Driving <b>UP</b>
Cash Cycle (rev days)	55.08	49.08	57.90	Driving <b>UP</b>
Accounts Receivable (rev days)	67.27	61.74	70.41	Driving <b>UP</b>
Inventory (rev days)	0.00	0.00	0.00	-
Accounts Payable (rev days)	12.91	12.65	12.51	Driving UP
Income tax to Rev %	1.62%	1.37%	1.66%	Driving UP
Cap Exp. to Rev %	3.08%	2.89%	3.25%	Driving <b>UP</b>

## **Analysis**

-4.0%

Improving free cash margin for the Software and Services industry is being driven by major increases in revenue and free cash flow, which has offset minor decreases in gross margins and operating cushion. The industry has also seen a slight improvement in cash cycle.

## **Conclusions**

The cash flow data reported through the fourth quarter of 2016 provides us with new insight into the U.S. economy. The ratios suggest steadily improving operating results for U.S. companies and a generally healthy economy, but one that continues to struggle to accelerate. The fact that many

companies are still holding back on capital expenditures suggests the economy still has room for further improvement.

Specifically, median free cash margin has increased continuously since December 2014, and achieved the highest level since June 2009. Median revenue has also continued to grow and surpassed the previous all-time high reached in June 2014. Similarly, median free cash flow continued to rise and passed its all-time high reached in December 2009.

While capital expenditures have largely returned to pre-recession levels, there remains a significant underinvestment driven by the drop-off in spending that occurred during the recession. A portion of the cash saved from that underinvestment appears to remain on corporate balance sheets, as evidenced by the all-time high of cash and short-term investments to revenue. To accelerate and strengthen the economy, US firms will need to start putting this capital to use again. The new US administration has recommended policies and tax reform that seem to target increased capital spending and business investment. The success of these policies will be apparent in the data of future quarterly reports on free cash margin.

We expect a continuation in the trend of improvements in both revenues and free cash flow as companies benefit from generally healthy economic conditions. As growth strengthens, we could see a decline in free cash margin, as inventories expand and capital spending increases. Through the fourth quarter of 2016, companies continue to display signs of a growing economy. However, it will be important maintain awarness of significant macroeconomic events, such as additional increases in interest rates, new Eurozone and Brexit political developments, and renewed instability on the Korean Peninsula – in addition to uncertainty surrounding the new U.S. administration and its economic policies.