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**CASH FLOW TRENDS AND THEIR FUNDAMENTAL DRIVERS:  
A VALUE-WEIGHTED INDEX OF THE S&P 500 NON-FINANCIALS**

**EXECUTIVE SUMMARY**

With this report, we introduce a series of cash flow indices for the non-financials of the S&P 500. Each index, consisting of cash flow measures and their fundamental drivers, are calculated as a value-weighted average. The objective is to permit us to look closely at the cash flow performance of the S&P and to better isolate the factors underlying that performance. Future reports will look at industry subsets of all public companies, such as technology, biotechnology, and other groups that are of particular interest.

Our analysis of the S&P 500 indicates that counter to recent trends, various cash flow measures were down in the four-quarter period ending December 31, 2005. The decline was driven by decreases in revenue and operating cushion, and by an increase in the cash cycle. Also of note, our earnings quality indicator, EQI, continued a declining trend begun in 2003.

Data for this research was provided by Cash Flow Analytics, LLC., [www.cashflowanalytics.com](http://www.cashflowanalytics.com). Charles Mulford is a principal in Cash Flow Analytics, LLC.

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**Georgia Tech Financial Analysis Lab**

The Georgia Tech Financial Analysis Lab conducts unbiased stock market research. Unbiased information is vital to effective investment decision-making. Accordingly, we think that independent research organizations, such as our own, have an important role to play in providing information to market participants.

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

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

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## Introduction

With this research report, we introduce a series of cash flow indices for the S&P 500. The objective of the report is to provide readers with some perspective on the financial performance of the average firm among the non-financials of the S&P 500. Our average firm is represented by a value-weighted index. We focus on cash flow, presenting certain cash flow measures that are analyzed using selected fundamental drivers. For example, are companies growing cash flow by increasing sales or cutting back expenses? Are working capital investments increasing or declining? How are capital expenditures faring? Answers to questions like these are critical for investors and can help form a foundation for evaluating the financial health of a company. This report highlights large U.S. firms, future reports will focus on individual industries including technology and biotechnology.

The body of the report will highlight our findings and include charts. Please see the appendix to view supporting data.

## Data and Methodology

Our data are provided by Cash Flow Analytics, LLC.<sup>1</sup> Each data amount is for a rolling four-quarter period ending with the date in question. For example, cash flow amounts for December 31, 2005, represent amounts for the four-quarters (year) ended December 31, 2005.

### *Deriving Cash Flow Amounts*

It is important to note that the cash flow amounts reported here, such as core operating cash flow and operating cash flow, are calculated measures. We do not use company-reported cash flow measures. We use each company's income statement, cleaned up for items that can be identified as nonoperating or nonrecurring, and period-to-period changes in each company's balance sheet, to compute our own cash flow measures. We do this because we think that we can derive a more meaningful measure of cash flow, especially operating cash flow and free cash flow, using such a balance-sheet change approach than by using each company's actual reported operating cash flow.

Consider, for example, capital expenditures that do not entail a cash payment. Such capital expenditures, which may entail either capital lease financing or finance proceeds provided by a lender directly to an equipment vendor, are not included in company-reported capital expenditures. They are excluded from capital expenditures even though the related assets and debt appear on the reporting company's balance sheet. Our balance-sheet change approach will include these amounts in capital expenditures. Consider too short-term investments classified as trading securities. While, according to GAAP, purchases and sales of such investments are included in operating cash flow, our approach instead classifies them as part of investing cash flow. Our approach also adjusts for acquisitions, which can give a nonrecurring boost to operating cash flow through the disposal of acquired inventory and receivables, or can understate capital expenditures through the inclusion of acquired equipment in cash payments for acquisitions. Through a balance-sheet change approach, acquired operating working capital, items such as receivables, inventory and prepaids, less deferred revenue, payables and accruals, are included in the calculation of operating cash flow. Similarly, acquired property, plant and equipment accounts are included in capital expenditures.

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<sup>1</sup> Cash Flow Analytics, LLC, 1727 Malvern Place, Duluth, Georgia, 30097. [www.cashflowanalytics.com](http://www.cashflowanalytics.com). Charles Mulford is a principal in Cash Flow Analytics, LLC.

Our approach is not perfect. Without manually reviewing each company's financial statements, we cannot adjust for every item that we think may misstate a company's sustainable operating or free cash flow. However, with limited resources, performing such a feat and covering such a large sample of firms on a timely basis is impractical. So we employ what we think is a useful and meaningful alternative that captures the bulk of the adjustments to reporting operating cash flow that are needed to derive a more useful measure of performance.

### ***Cash Flow Definitions***

Our primary focus is on the fundamental drivers underlying three measures of cash flow that we consider the keys to financial performance.

1) Core operating cash flow - cash flow generated by core or central operations. It is measured before other income such as interest or dividend income, interest paid on borrowed funds, and before income taxes paid.

2) Operating cash flow - cash flow from operations after interest charges and income taxes, and includes sustainable sources of other income such as interest or dividend income. It is defined in a manner consistent with the GAAP definition of cash provided by operating activities, but is calculated using the income statement and changes in balance sheet accounts. Accordingly, operating cash flow will differ from the GAAP definition. However, we think that our calculated operating cash flow measure will give a more sustainable and meaningful measure of cash flow.

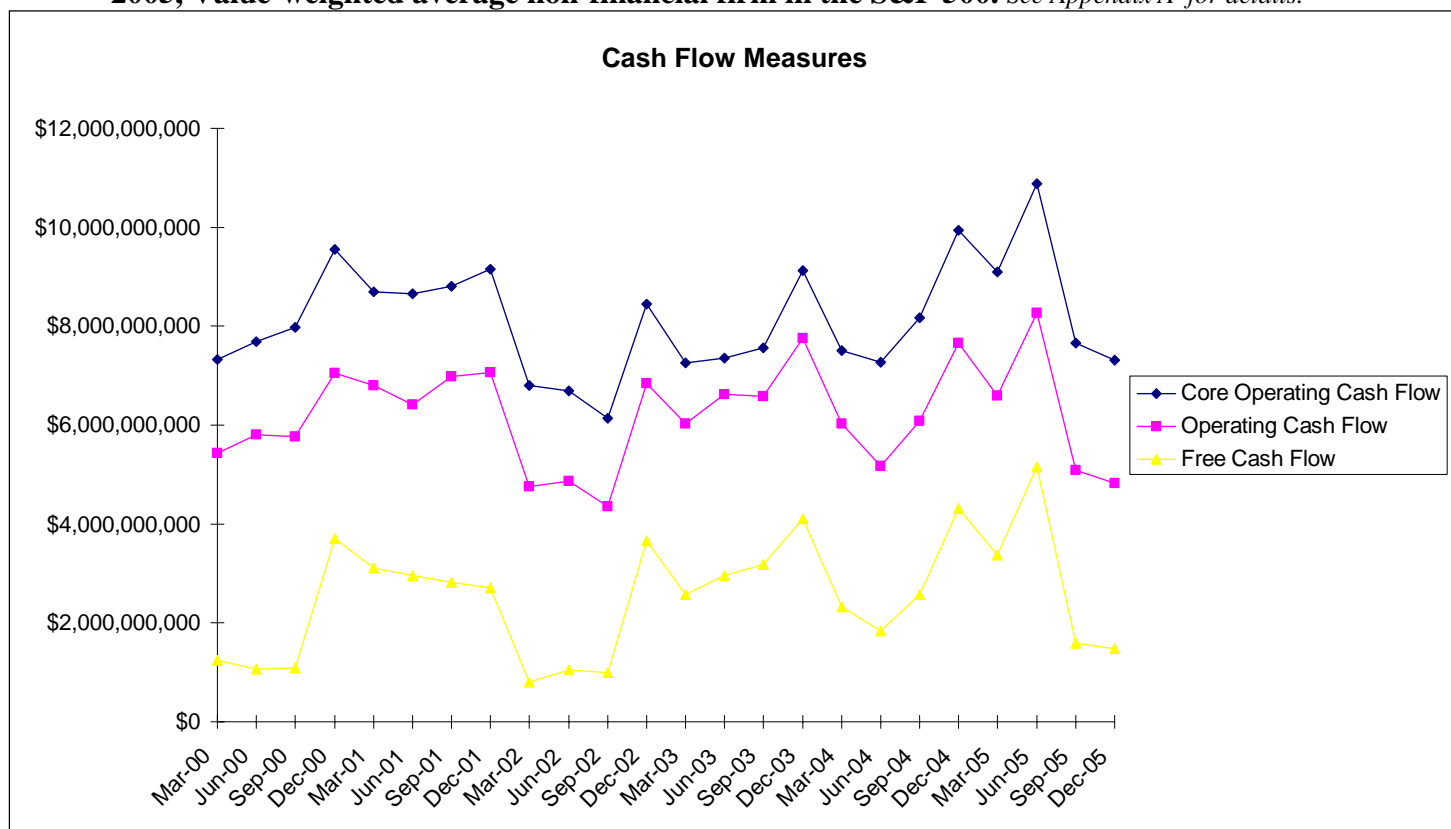
3) Free cash flow - cash flow available for common shareholders that can be used for such discretionary purposes as stock buybacks and dividends without affecting the firm's ability to grow and generate more. This measure is calculated as operating cash flow less preferred dividends and net capital expenditures.

We begin by presenting in Exhibit 1 these three measures of cash flow - core operating cash flow, operating cash flow and free cash flow – for the value-weighted average firm for each annual, four-quarter ending period since the four quarters ending March, 2000. We then supplement the data with a closer look at the fundamental drivers behind the cash flow measures.

## Average Large Cap: A Study of the S&P 500 Non-Financials

### Cash Flow Measures

**Exhibit 1. Core Operating Cash Flow, Operating Cash Flow and Free Cash Flow, 2000 – 2005, Value-weighted average non-financial firm in the S&P 500. See Appendix A for details.**



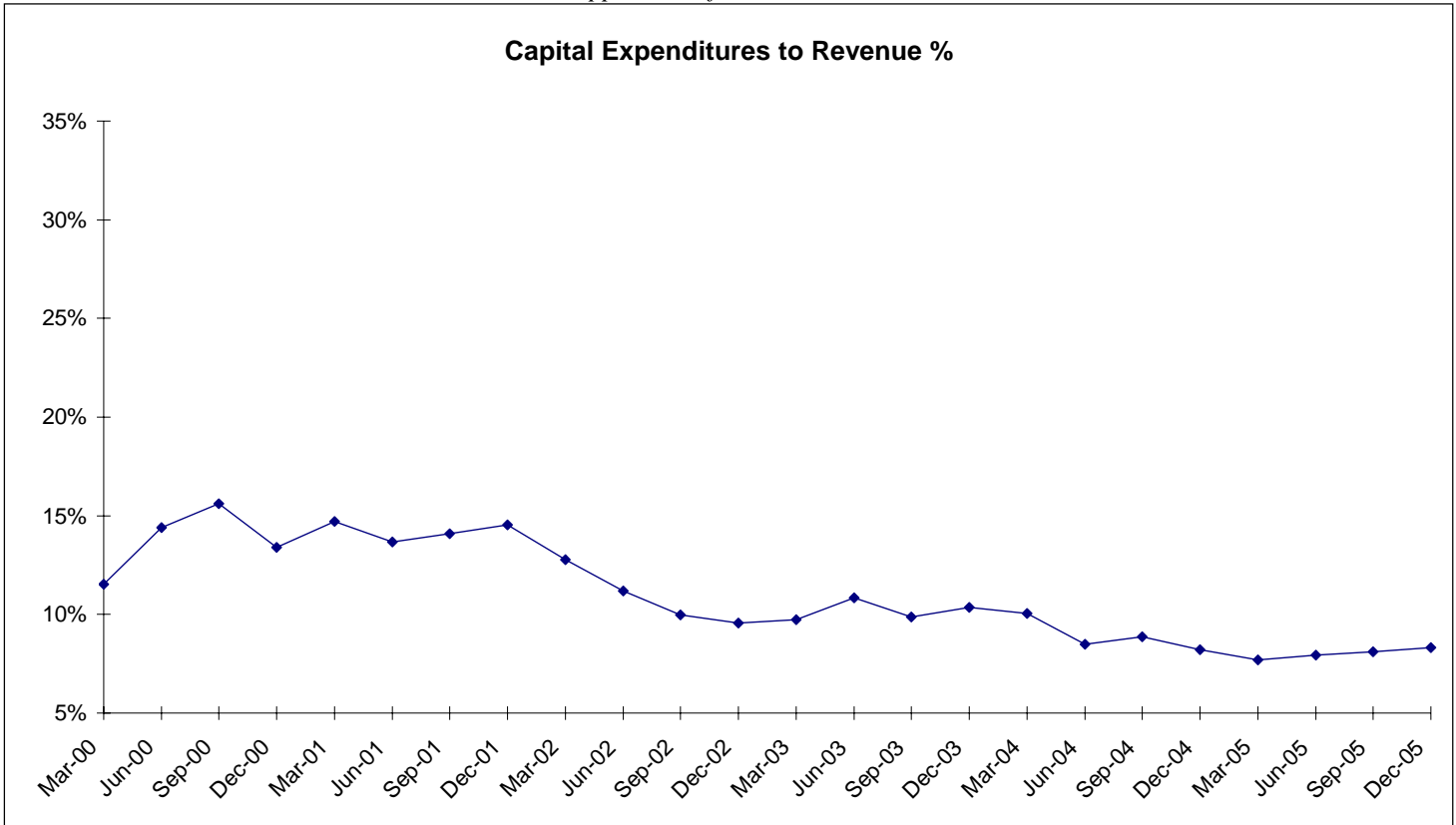
### Results for Four Quarters Ending December 2005 Compared with September 2005:

- **Core Operating Cash Flow – \$7.3 billion down 4.5%**
- **Operating Cash Flow – \$4.8 billion down 5.1%**
- **Free Cash Flow – \$1.5 billion down 7.1%**

All of the cash flow measures continued a downward trend that began last period. The measures had reached 5-year highs in the June period but have weakened since then. Free cash flow is now at the lowest point it has been since the four quarters ending September 2002.

The main difference between free cash flow and operating cash flow is capital expenditures. Exhibit 2 presents a graph of capital expenditures as a percentage of revenue. This gives a clear picture of the level of spending for the average S&P 500 non-financial firm.

**Exhibit 2. Capital Expenditures to Revenue %, 2000 – 2005, Value-weighted average non-financial firm in the S&P 500.** See Appendix B for details.

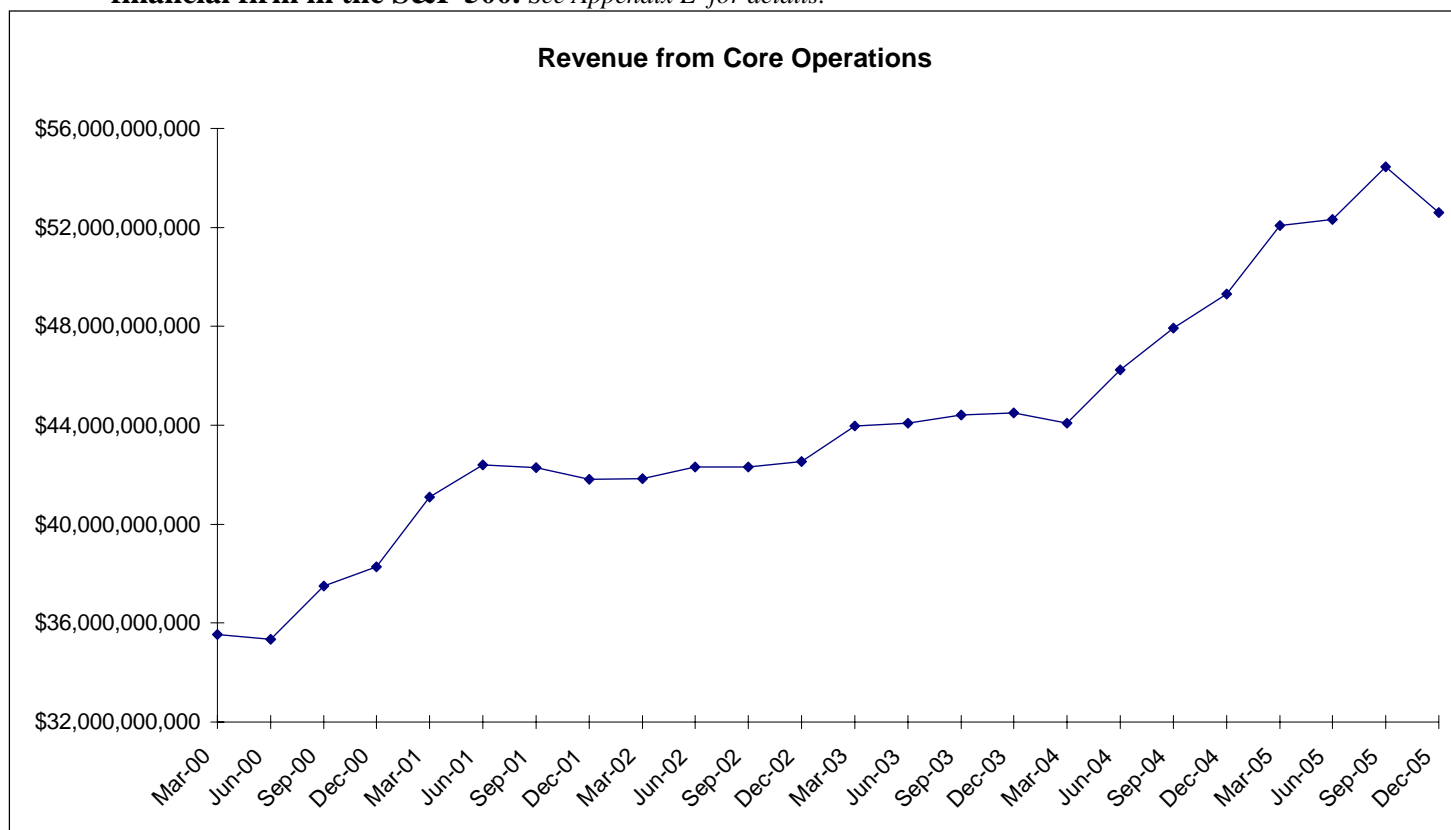


The percentage increased 2.7% to 8.3% of revenue in the December 2005 period from 8.1% in the September 2005 period. This indicates a slight increase in capital expenditures. The level of spending on capital expenditures as a percent of revenue is still much lower than it was in 2000.

## Cash Flow Drivers

There are certain fundamental drivers that have direct effects on core operating cash flow, operating cash flow and accordingly, free cash flow. These drivers capture the essence of profitability and efficiency, and through them, we can get a clearer picture on the sustainability of cash flow.

**Exhibit 3. Revenue from Core Operations, 2000 – 2005, Value-weighted average non-financial firm in the S&P 500.** See Appendix E for details.



### Revenue - \$52.6 billion down 3.4% during the four quarters ended December 2005 from September 2005.

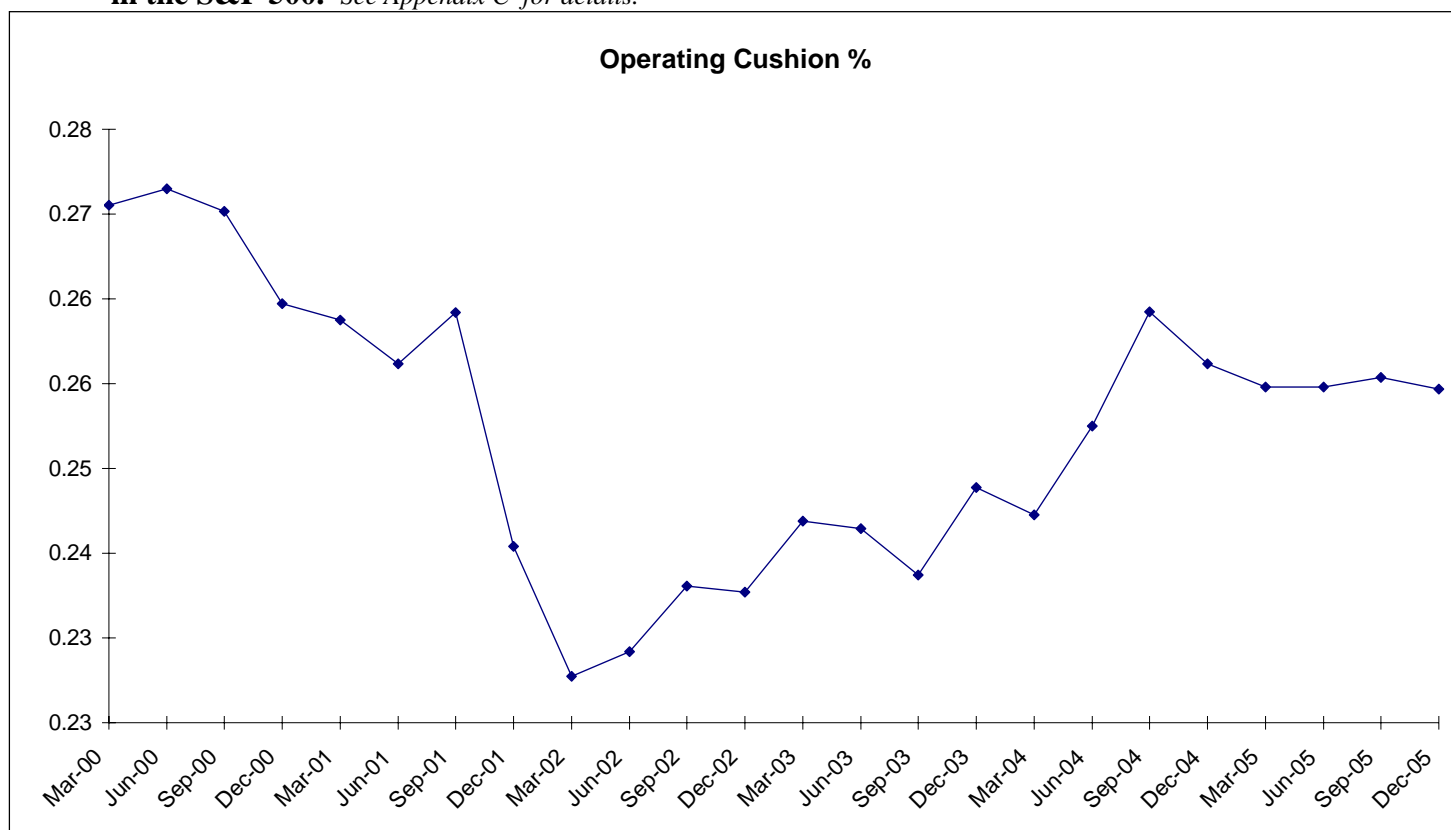
Helping to explain the decline in cash flow in the December ended year is a notable decline in revenue. Revenue for the average firm declined 3.4%.

## Operating Cushion – 25.5%

The operating cushion % is the contribution of each revenue dollar to operating profit *before* the non-cash expenses of depreciation and amortization. It is calculated by dividing operating profit (revenue less cost of goods sold and other operating expenses such as SG&A and R&D) before depreciation and amortization by revenue. The operating cushion % for a cash business, that is, a company without operating working capital needs, would show the contribution of each dollar of sales to core operating cash flow. Exhibit 4 presents a graph of the operating cushion %.

In the four quarters ending December 2005, the ratio reached 25.5%, down from 25.6% in the September 2005 period. The current trend indicates that, relative to revenue, the average company's costs increased slightly during the period. The cushion has leveled out at levels below those enjoyed in 2000, but well above the levels seen in 2002.

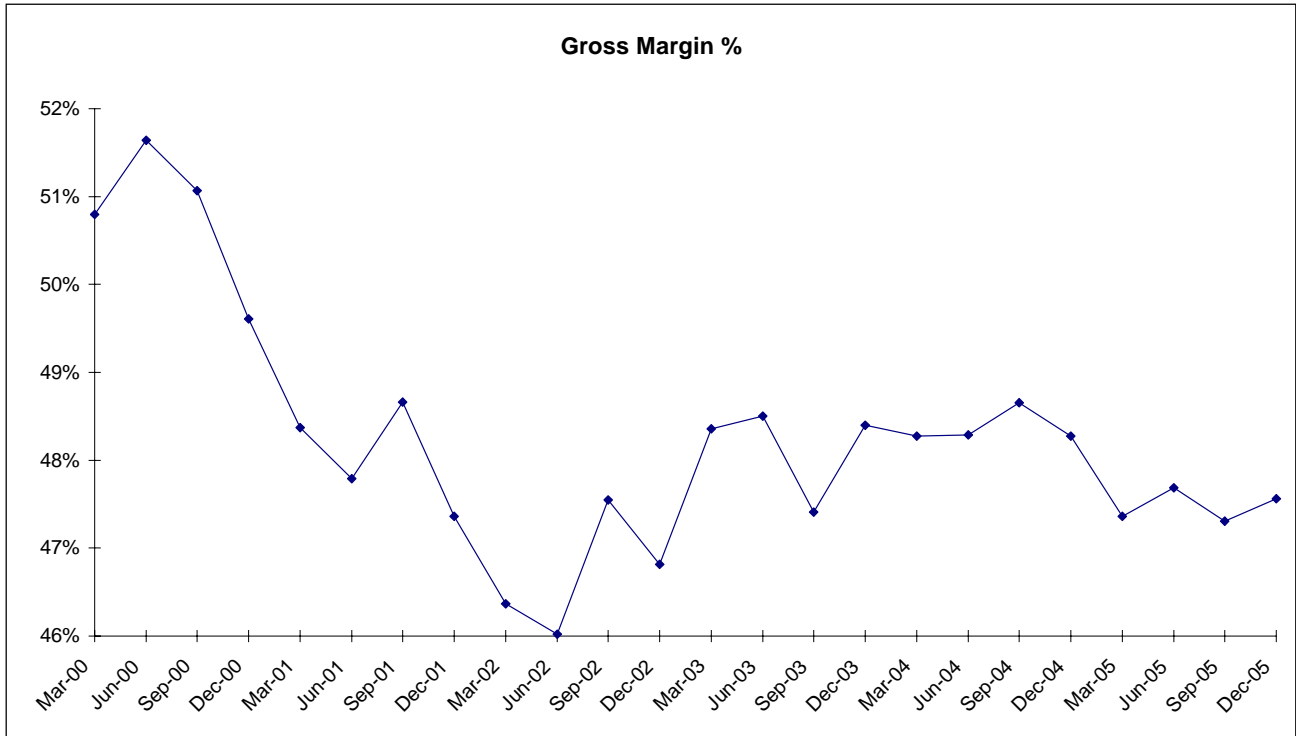
**Exhibit 4. Operating Cushion %, 2000 – 2005, Value-weighted average non-financial firm in the S&P 500.** See Appendix C for details.



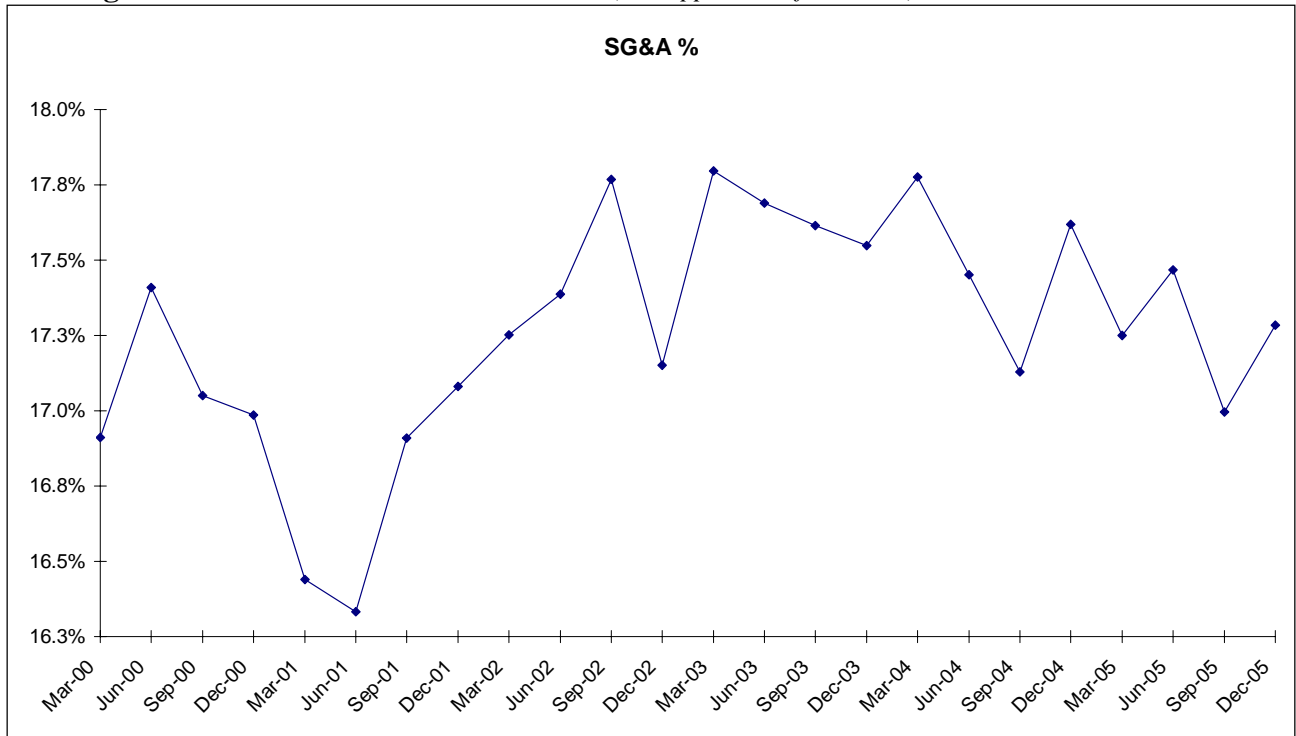
The operating cushion % consists of the gross margin % less the SG&A % and R&D %, all calculated before depreciation and amortization expense. More insight into changes in the operating cushion % can be gained by examining trends in all of its components. Graphs of the component measures are presented in Exhibits 5, 6 and 7.



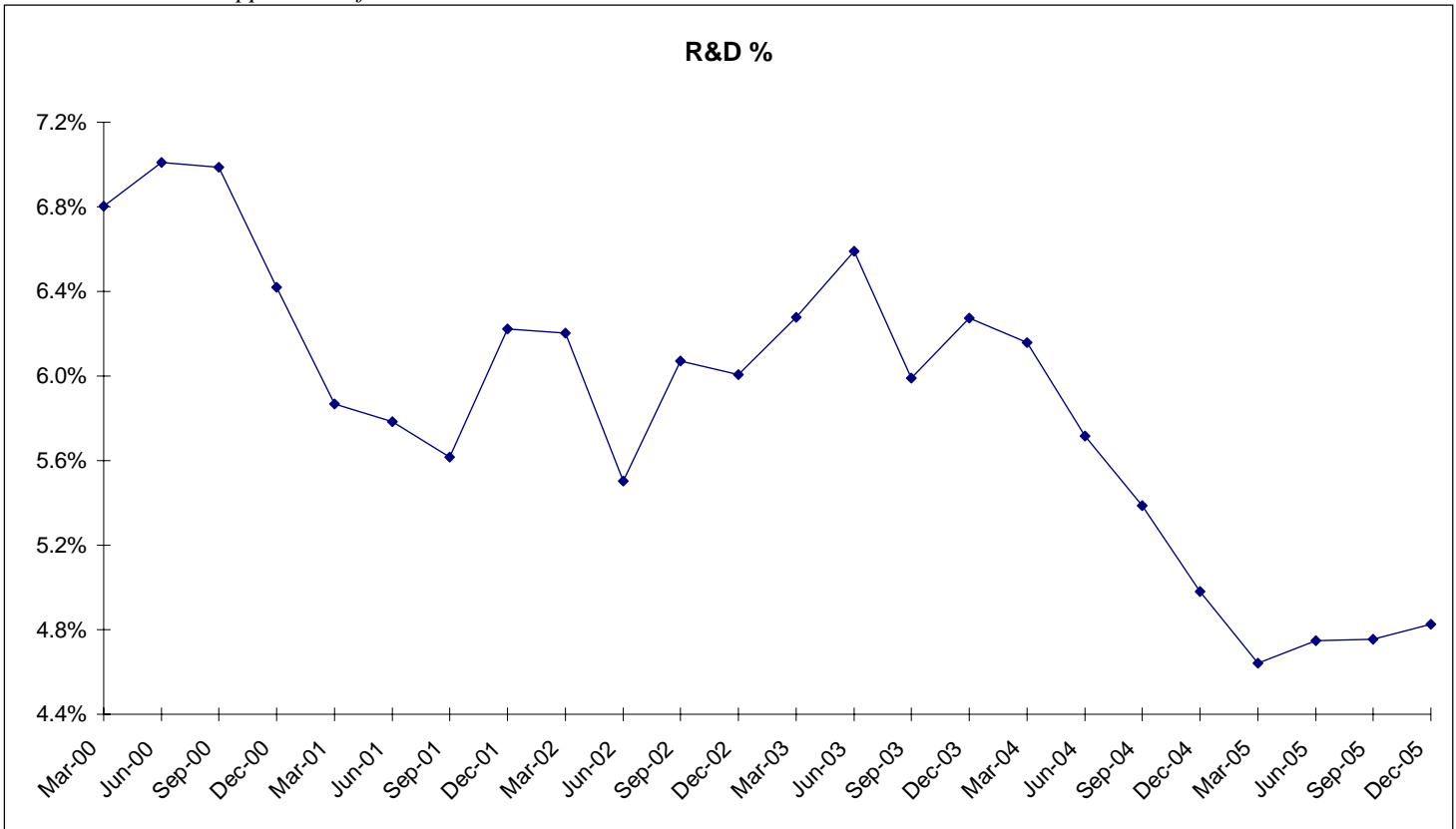
**Exhibit 5. Gross Margin %, 2000 – 2005, Value-weighted average non-financial firm in the S&P 500.** See Appendix C for details.



**Exhibit 6. SG&A % (before depreciation and amortization), 2000 – 2005, Value-weighted average non-financial firm in the S&P 500** (See Appendix C for details).



**Exhibit 7. R&D %, 2000 – 2005, Value-weighted average non-financial firm in the S&P 500.** See Appendix C for details.



In examining Exhibits 5, 6, and 7 we see that the decline in operating cushion last period was a result of increases in SG&A% and R&D%. A slight improvement in Gross Margin partially offset the increased costs in the two other components of operating cushion.

## Cash Cycle

The operating cushion % does not include operating working capital needs, which clearly require uses of cash. As revenues grow, firms must invest increasing amounts in such operating working capital accounts as accounts receivable, inventory, prepaid expenses, less accounts payable, accrued expenses payable and deferred revenue. The cash cycle is one overall measure of a firm's operating working capital requirements. It measures the number of revenue days a firm's cash is tied up in operating working capital. Recent cash cycle trends for the S&P 500 are presented in Exhibit 8.

**Exhibit 8. Cash Cycle, 2000 – 2005, Value-weighted average non-financial firm in the S&P 500.** See Appendix D for details.

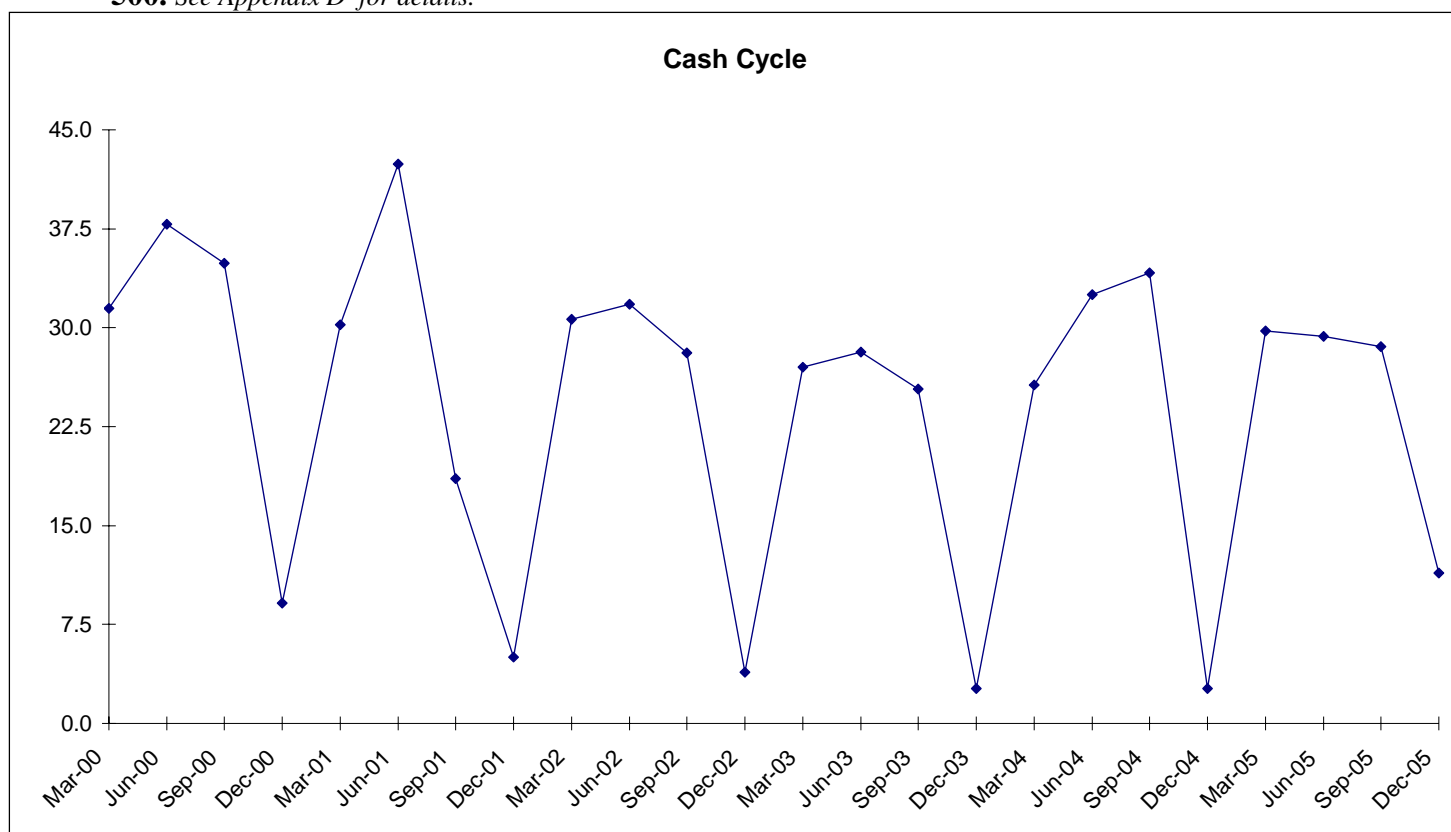
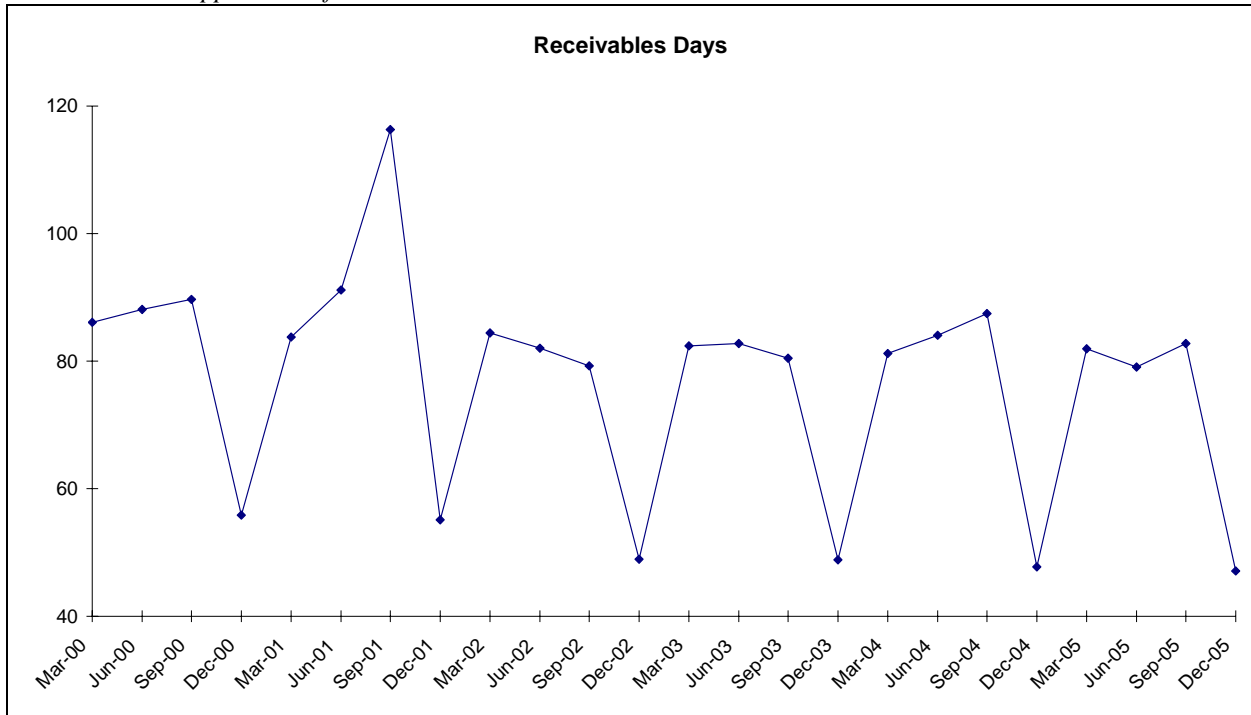


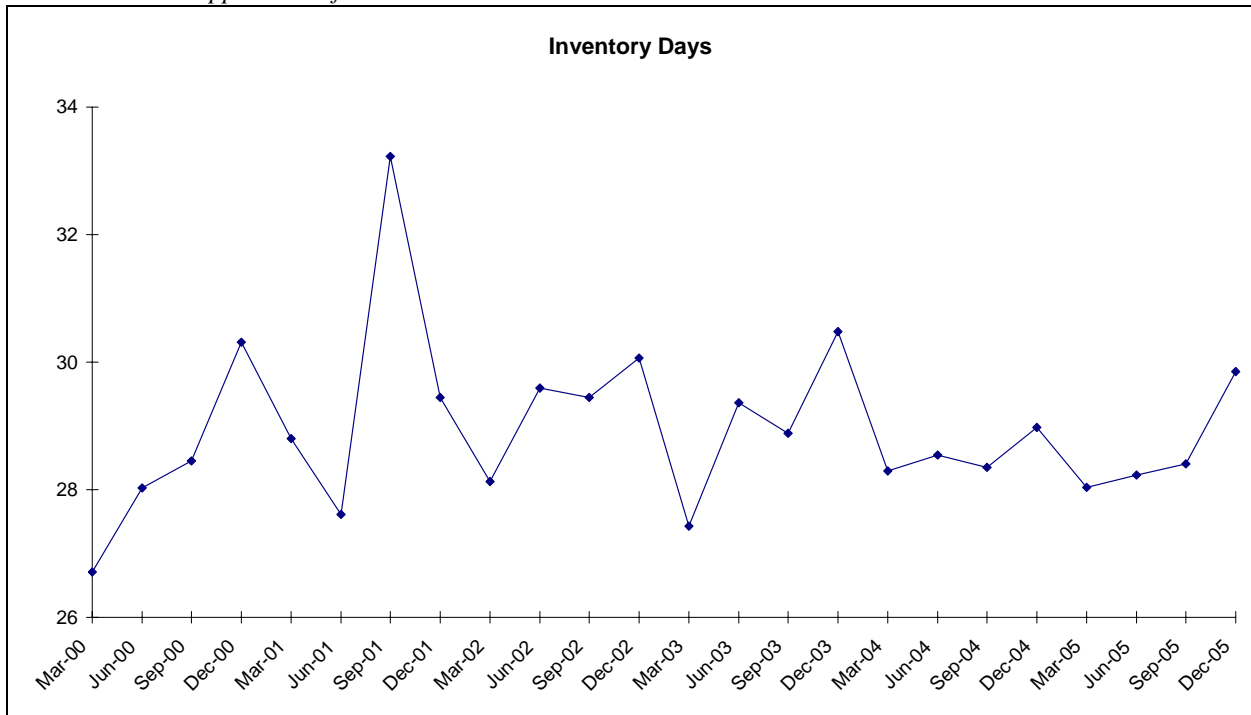
Exhibit 8 shows a very strong seasonal effect to companies' management of operating working capital. Working capital is at its lowest and firms are most liquid with each four-quarter period ending in December. Companies have been increasing this cash efficiency metric recently. However, it appears a bottom was reached in 2004. The measure jumped to 11.4 days in December 2005 from 2.6 days in December 2004.

It is important to determine the cause for the decrease in efficiency. As seen in Exhibit 9, it was not accounts receivable, as receivable days actually declined slightly. The cash cycle increase between December 2004 and December 2005 was actually driven by an increase in inventory days and a decline in payables days. Refer to Exhibits 10 and 11.

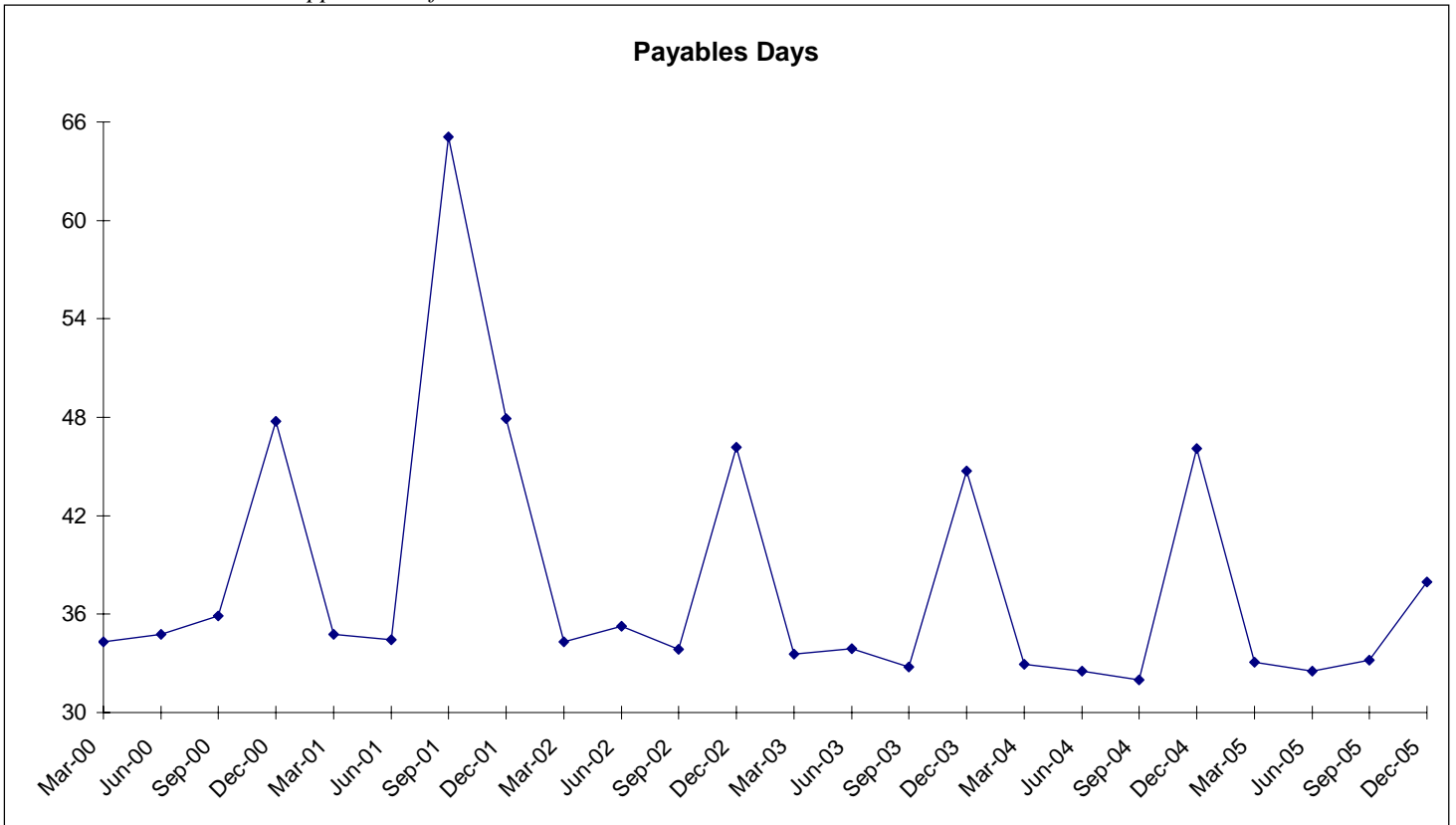
**Exhibit 9. Receivables Days, 2000 – 2005, Value-weighted average non-financial firm in the S&P 500.** See Appendix D for details.



**Exhibit 10. Inventory Days, 2000 – 2005, Value-weighted average non-financial firm in the S&P 500.** See Appendix D for details.



**Exhibit 11. Payables Days, 2000 – 2005, Value-weighted average non-financial firm in the S&P 500.** See Appendix D for details.



Exhibits 10 and 11 show an increase in both inventory and payables days respectively. This explains the increase in the cash cycle during the last period. Inventory days is also a very important metric for the entire economy. If companies are carrying excess inventory, production is exceeding demand. Historically, a large increase in inventory leads to price discounts and lower corporate profits.

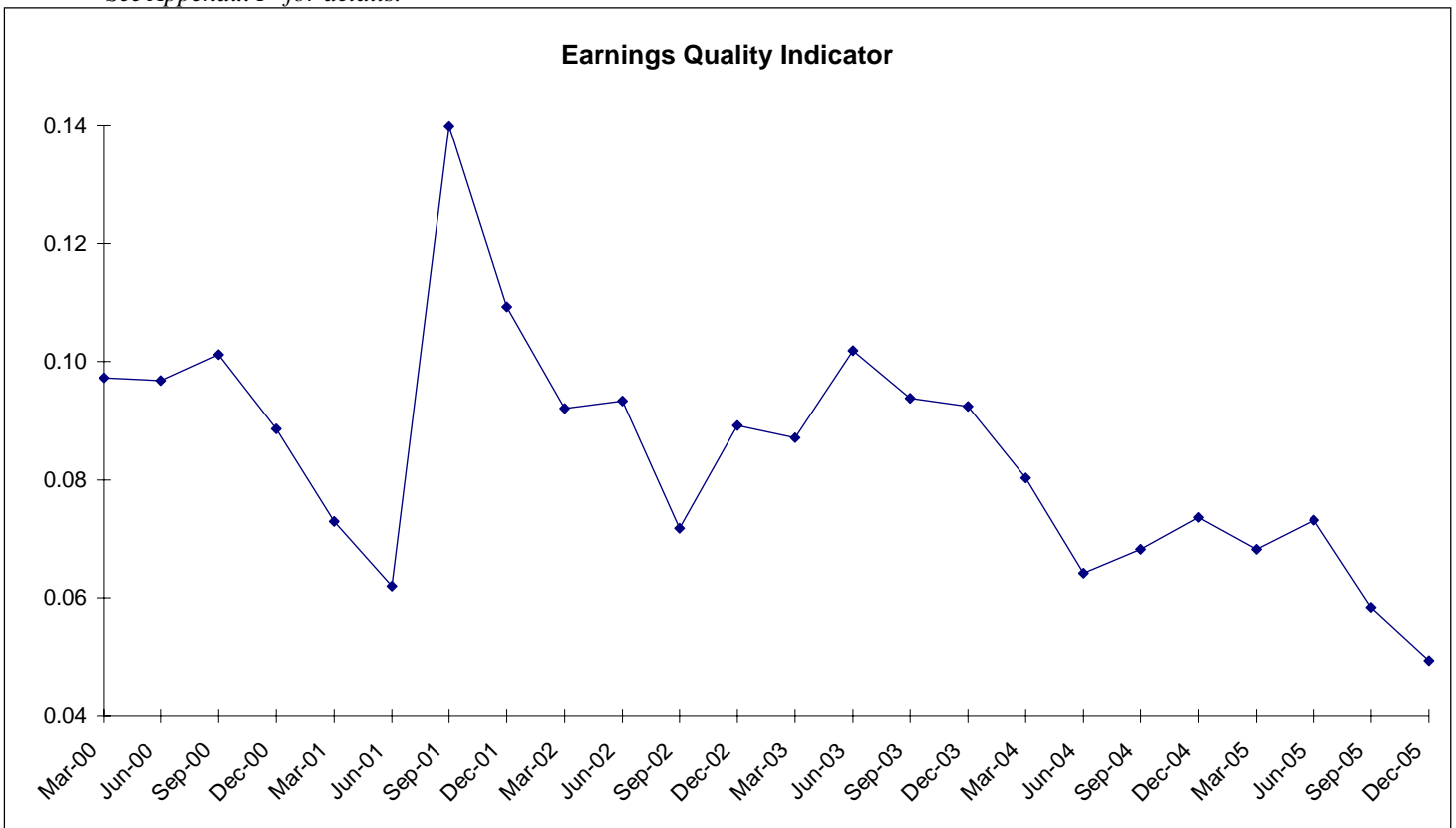
### Earnings Quality Indicator (EQI)

The EQI is an interpretive ratio used to measure the relationship between sustainable operating cash flow and net income. The ratio measures the excess of sustainable operating cash flow over net income, adjusted for known items of nonrecurring income or expense, all as a percentage of revenue.

It is a measure of the extent to which earnings are realized as cash flow. Earnings that are not realized as cash flow are at risk for decline through write-downs of non-cash assets. A graph of EQI is presented in Exhibit 12.

#### Exhibit 12. EQI, 2000 – 2005, Value-weighted average non-financial firm in the S&P 500.

See Appendix F for details.

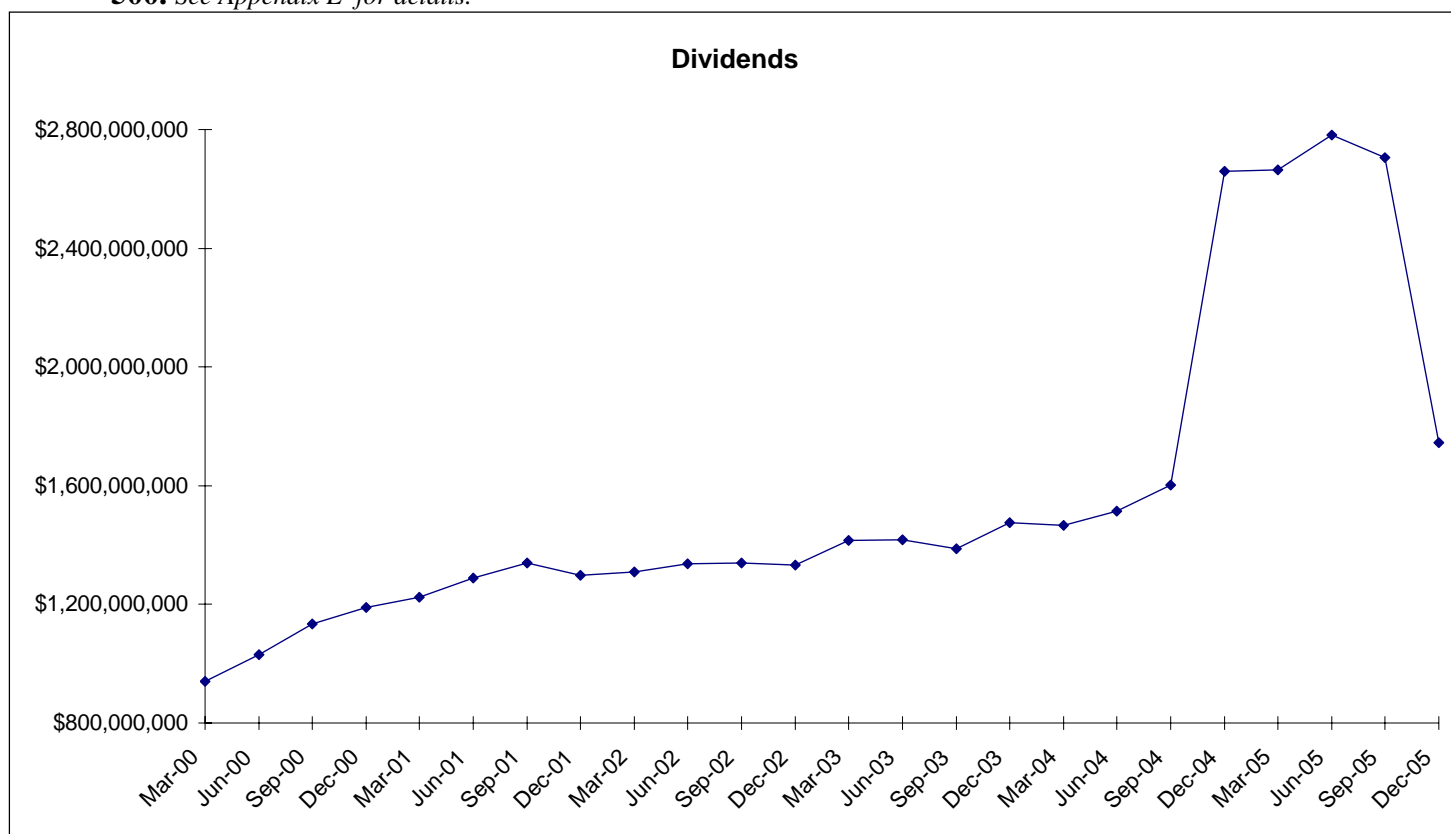


As noted in Exhibit 12, there is a downward trend in EQI. This development indicates that, relative to revenue, earnings are growing faster than operating cash flow. The implication is that non-cash balances are accumulating on the balance sheet. Such a finding is consistent with the noted drop in operating cash flow and the increase observed in the cash cycle. If earnings are not ultimately realized, future earnings are at risk for decline.

## Dividends

Dividends are an important signal of corporate expectations regarding financial strength. A graph of dividends paid on common stock is presented in Exhibit 13.

**Exhibit 13. Dividends, 2000 – 2005, Value-weighted average non-financial firm in the S&P 500.** See Appendix E for details.



Dividends declined sharply during the four quarters ending December 2005. Dividends fell 35% to \$1.7 billion from \$2.7 billion in the September 2005 period. This drop can be attributed to the large one-time dividend paid to Microsoft shareholders in December of 2004. The four periods including the Microsoft dividend form a plateau in the exhibit. One way to analyze dividends is to eliminate the noise and follow the trend prior to the one-time event. Dividends have shown solid growth since September 2004, which is the period prior to the inclusion of the Microsoft dividend.

## Conclusion

In terms of cash flow generation, a slow down of the American economy appears to be underway. Cash flows for the average S&P 500 non-financial declined for the December 2005 period from September 2005. Driving the decline in cash flow is a drop in revenue, a decline in profitability, as measured by the operating cushion %, and an increase in the cash cycle. One measure to watch is EQI, to see if earnings continue to grow faster than cash flow.

**Appendix A – Cash Flow Measures. Value-weighted average S&P 500 non-financials. Data for four quarters ending. (Amounts in dollars)**

Date	Core Operating Cash Flow	% Change	Operating Cash Flow	% Change	Free Cash Flow	% Change
3/31/2003	7,252,539,527		6,027,364,032		2,578,156,755	
6/30/2003	7,357,873,282	1.5%	6,623,129,582	9.9%	2,962,395,288	14.9%
9/30/2003	7,564,378,559	2.8%	6,586,937,381	-0.5%	3,181,721,678	7.4%
12/31/2003	9,130,363,706	20.7%	7,759,720,056	17.8%	4,099,830,265	28.9%
3/31/2004	7,511,082,863	-17.7%	6,021,837,656	-22.4%	2,317,619,336	-43.5%
6/30/2004	7,273,143,616	-3.2%	5,174,334,985	-14.1%	1,842,430,311	-20.5%
9/30/2004	8,176,882,278	12.4%	6,085,184,918	17.6%	2,575,082,001	39.8%
12/31/2004	9,940,167,064	21.6%	7,664,168,041	25.9%	4,318,932,657	67.7%
3/31/2005	9,090,545,402	-8.5%	6,597,499,939	-13.9%	3,379,494,077	-21.8%
6/30/2005	10,873,999,297	19.6%	8,269,158,721	25.3%	5,157,746,483	52.6%
9/30/2005	7,664,385,947	-29.5%	5,086,883,399	-38.5%	1,588,265,484	-69.2%
12/31/2005	7,319,012,680	-4.5%	4,828,109,577	-5.1%	1,476,061,479	-7.1%

**Appendix B – Expenditures. Value-weighted average S&P 500 non-financials. Data for four quarters ending.**

Date	Income Taxes Paid to Revenue%	% Change	Capital Expenditures to Revenue %	% Change
3/31/2003	1.8%		9.7%	
6/30/2003	0.6%	-68.4%	10.9%	11.4%
9/30/2003	1.7%	190.2%	9.9%	-8.9%
12/31/2003	2.5%	52.3%	10.4%	4.8%
3/31/2004	3.1%	20.3%	10.0%	-3.0%
6/30/2004	4.2%	37.9%	8.5%	-15.7%
9/30/2004	4.1%	-3.6%	8.9%	4.7%
12/31/2004	4.1%	1.5%	8.2%	-7.5%
3/31/2005	4.1%	-0.3%	7.7%	-6.0%
6/30/2005	4.4%	6.6%	7.9%	3.0%
9/30/2005	4.3%	-1.3%	8.1%	2.1%
12/31/2005	4.0%	-6.3%	8.3%	2.7%



**Appendix C – Profitability. Value-weighted average S&P 500 non-financials. Data for four quarters ending.**

Date	Operating Cushion %	% Change	Gross Margin %	% Change	SG&A%	% Change	R&D%	% Change
3/31/2003	24.3%		48.4%		17.8%		6.3%	
6/30/2003	24.2%	-0.3%	48.5%	0.3%	17.7%	-0.6%	6.6%	5.0%
9/30/2003	23.8%	-1.7%	47.4%	-2.2%	17.6%	-0.4%	6.0%	-9.1%
12/31/2003	24.6%	3.2%	48.4%	2.1%	17.5%	-0.4%	6.3%	4.8%
3/31/2004	24.3%	-1.0%	48.3%	-0.3%	17.8%	1.3%	6.2%	-1.8%
6/30/2004	25.1%	3.2%	48.3%	0.0%	17.5%	-1.8%	5.7%	-7.2%
9/30/2004	26.1%	4.0%	48.7%	0.7%	17.1%	-1.8%	5.4%	-5.8%
12/31/2004	25.7%	-1.8%	48.3%	-0.8%	17.6%	2.9%	5.0%	-7.5%
3/31/2005	25.5%	-0.8%	47.4%	-1.9%	17.3%	-2.1%	4.6%	-6.8%
6/30/2005	25.5%	0.0%	47.7%	0.7%	17.5%	1.3%	4.7%	2.2%
9/30/2005	25.6%	0.3%	47.3%	-0.8%	17.0%	-2.7%	4.8%	0.2%
12/31/2005	25.5%	-0.4%	47.6%	0.5%	17.3%	1.7%	4.8%	1.5%

**Appendix D – Efficiency. Value-weighted average S&P 500 non-financials. Data for four quarters ending.**

Date	Cash Cycle	% Change	Inventory Days	% Change	Receivables Days	% Change	Payables Days	% Change
3/31/2003	27		27		82		34	
6/30/2003	28	4.3%	29	7.1%	83	0.4%	34	1.0%
9/30/2003	25	-9.9%	29	-1.6%	80	-2.8%	33	-3.3%
12/31/2003	3	-89.6%	30	5.5%	49	-39.3%	45	36.4%
3/31/2004	26	873.5%	28	-7.2%	81	66.2%	33	-26.4%
6/30/2004	33	26.8%	29	0.8%	84	3.5%	33	-1.2%
9/30/2004	34	5.1%	28	-0.7%	87	4.0%	32	-1.6%
12/31/2004	3	-92.3%	29	2.2%	48	-45.4%	46	44.0%
3/31/2005	30	1031.2%	28	-3.2%	82	71.6%	33	-28.3%
6/30/2005	29	-1.4%	28	0.7%	79	-3.5%	33	-1.6%
9/30/2005	29	-2.6%	28	0.6%	83	4.7%	33	2.1%
12/31/2005	11	-60.0%	30	5.1%	47	-43.1%	38	14.4%

**Appendix E – Other Valuation Metrics. Value-weighted average S&P 500 non-financials. Data for four quarters ending. (Amounts in Dollars)**

Date	Revenue	% Change	Market Capitalization	% Change	Cash and Short-Term Investments	% Change	Dividends	% Change
3/31/2003	43,963,910,350		84,967,015,479		5,970,046,984		1,415,786,858	
6/30/2003	44,075,916,537	0.3%	90,618,049,684	6.7%	5,840,637,281	-2.2%	1,416,656,151	0.1%
9/30/2003	44,415,263,447	0.8%	90,887,634,389	0.3%	6,348,253,392	8.7%	1,386,997,010	-2.1%
12/31/2003	44,510,334,368	0.2%	95,012,110,061	4.5%	6,498,025,908	2.4%	1,474,872,069	6.3%
3/31/2004	44,089,600,033	-0.9%	90,682,109,709	-4.6%	6,532,949,236	0.5%	1,465,238,300	-0.7%
6/30/2004	46,246,872,763	4.9%	94,824,754,422	4.6%	7,075,206,515	8.3%	1,513,793,876	3.3%
9/30/2004	47,935,427,171	3.7%	92,479,568,054	-2.5%	7,596,486,415	7.4%	1,602,681,837	5.9%
12/31/2004	49,316,944,295	2.9%	94,066,506,167	1.7%	6,855,785,656	-9.8%	2,658,312,062	65.9%
3/31/2005	52,071,685,266	5.6%	94,880,983,309	0.9%	6,729,190,140	-1.8%	2,663,503,369	0.2%
6/30/2005	52,312,012,420	0.5%	90,583,335,264	-4.5%	6,606,368,149	-1.8%	2,780,470,241	4.4%
9/30/2005	54,462,247,708	4.1%	92,361,922,598	2.0%	6,692,492,581	1.3%	2,706,598,642	-2.7%
12/31/2005	52,604,512,475	-3.4%	88,582,250,777	-4.1%	6,654,790,951	-0.6%	1,745,044,871	-35.5%

**Appendix F – Other Performance Metrics. Value-weighted average S&P 500 non-financials. Data for four quarters ending.**

Date	Earnings Quality Indicator	% Change	Earnings Sustainability	% Change	Cash Flow Sustainability	% Change
3/31/2003	0.087		0.034		0.009	
6/30/2003	0.102	17.0%	0.038	12.5%	0.027	206.3%
9/30/2003	0.094	-7.9%	0.027	-28.0%	0.019	-31.1%
12/31/2003	0.092	-1.6%	0.020	-28.6%	0.015	-19.2%
3/31/2004	0.080	-13.0%	0.017	-12.4%	0.003	-79.5%
6/30/2004	0.064	-20.1%	0.012	-27.4%	0.012	298.7%
9/30/2004	0.068	6.2%	0.017	36.8%	0.004	-67.2%
12/31/2004	0.074	8.0%	0.017	0.2%	0.003	-16.7%
3/31/2005	0.068	-7.3%	0.014	-15.1%	0.000	-87.2%
6/30/2005	0.073	7.2%	0.016	11.9%	0.010	2334.9%
9/30/2005	0.058	-20.3%	0.014	-11.0%	0.001	-90.9%
12/31/2005	0.049	-15.4%	0.010	-32.1%	0.011	1028.4%