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

**EXECUTIVE SUMMARY**

Cash flow is at the heart of any discussion of financial performance and valuation. Investors, creditors and the analysts who serve them are all interested in whether a firm is generating cash flow and whether that cash flow can be expected to recur. The level of debt retirements, dividends, stock buybacks, acquisitions and investments all require that firms generate discretionary, that is, free cash flow. A careful analysis of the fundamental drivers behind that cash flow can shed much light on whether reported amounts will recur.

In this research report, we look at long-term cash flow trends and carefully examine the fundamental drivers underlying those trends. A supplementary analysis is provided of trends in capital expenditures, dividends, cash balances and market cap. A summary of important findings are presented on page 2.

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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## **Cash Flow Trends and Their Fundamental Drivers: A Study of the S&P 500 Non-Financials**

### **Important Findings**

- **There is a very high long-term correlation between core operating cash flow and changes in market cap.**
- **Core operating cash flow has increased markedly since March 2004.**
- **Driving the improvement in core operating cash flow are revenue growth and improvements in operating cushion % (operating profit before non-cash expenses such as depreciation).**
- **Improvements in operating cushion % are primarily the result of reductions in SG&A% (excl. depreciation) and R&D% (excluding depreciation). Gross margin % (excluding depreciation) has declined.**
- **The cash cycle (operating working capital in revenue days) has declined, but only slightly.**
- **Capital expenditures declined through March 2005, but have been rising since.**
- **Companies in the S&P 500 (non-financials) are holding a cash hoard of some \$737.8 billion on the balance sheet, which is up 136% from March 2000.**

## Introduction

Long-time readers of the research published by the Georgia Tech Financial Analysis Lab know that our reports are often focused on issues affecting cash flow. Often our reports look at cash flow classification and identify situations where investors and analysts may be misled by the manner in which the cash flows associated with a transaction are reported.

With this research report, we take an entirely new and different tack. Our objective here is to look at key measures of cash flow, such as core operating cash flow, operating cash flow and free cash flow, and study the fundamental drivers behind changes in the direction of those cash flow amounts. Our plan is to study a large segment of the market and at a minimum, report on cash flow developments on a quarterly basis. However, it is our hope and expectation that we will be in a position to publish our cash flow reports more frequently than on a quarterly basis, especially as we begin to look at different market segments and industries.

Cash flow, especially core operating cash flow, operating cash flow and free cash flow, are always at the heart of any discussion of financial performance and valuation. Investors, creditors and the analysts who serve them are all interested in whether a firm is generating cash flow and whether that cash flow can be expected to recur. The level of debt retirements, dividends, stock buybacks, acquisitions and investments, all require that firms generate discretionary, that is, free cash flow. A careful analysis of the fundamental drivers behind that cash flow can shed much light on whether reported amounts will recur.

For example, an increase in free cash flow resulting from a draw down in inventory or an increase in the amount of time taken to settle with vendors is not sustainable. Similarly, reductions in income taxes paid because of short-lived credits or reductions in capital expenditures will not boost free cash flow in the long run. Thus, our objective is to look at cash flow drivers and their underlying changes, and shed light on what we see. In the process, our plan is to give our readers some insight into where, on a cash flow basis, we have been and to give some insight into future directions.

In this first cash flow research report, we focus our attention on the non-financials of the S&P 500. We chose this group because of its importance to the market as a whole. We do a careful analysis of this group over the past five years. However, to gain more perspective, we supplement our work with a look at cash flow trends for the non-financials of the S&P 100 over a much longer period, one dating back to 1992.

We welcome your thoughts, questions and suggestions. If there are subsets of our data into which you would like us to take a closer look, we welcome that input.

## Data and Methodology

Our data is 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 September 30, 2005, represent amounts for the four-quarters (year) ended September 30, 2005.

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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.

### ***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 will 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.

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.

### ***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.

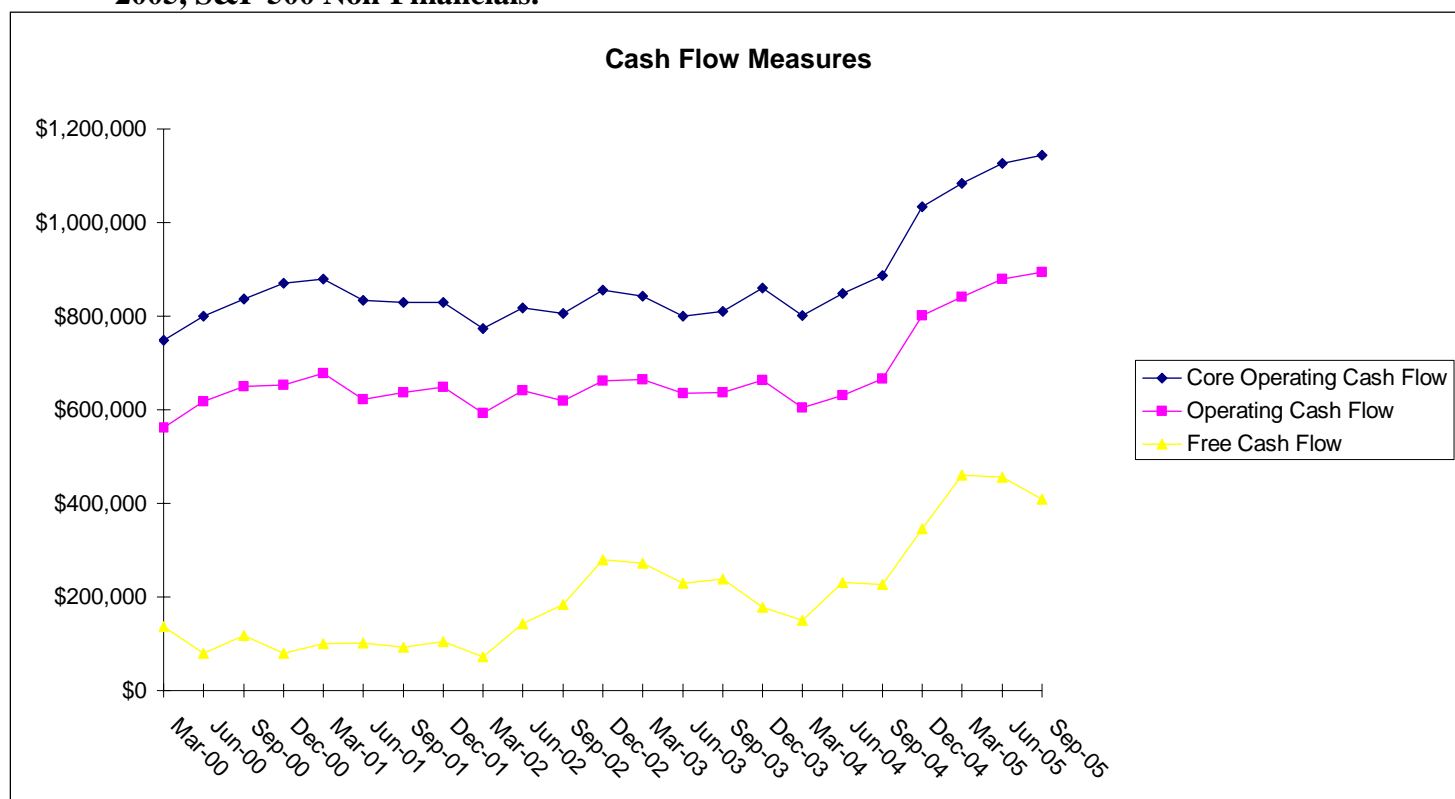
- 1) Core operating cash flow - cash flow generated by core or central operations. It is measured before other income such as interest or dividend income, interest paid on borrowed funds, and before income taxes paid.
- 2) Operating cash flow - cash flow from operations after interest charges and income 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 Table 1 these three measures of cash flow - core operating cash flow, operating cash flow and free cash flow - for the non-financials of the S&P 500 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.

## Cash Flow Measures

**Table 1. Core Operating Cash Flow, Operating Cash Flow and Free Cash Flow, 2000 – 2005, S&P 500 Non-Financials.**



### Core Operating Cash Flow - \$1.144 trillion

After a relatively quiet period during which the measure trended flat, core operating cash flow, which is generated by core operations and excludes other income such as interest and dividends, interest paid and income taxes paid, began rising significantly after the four quarters ended March 31, 2004. It reached \$1.144 trillion during the four quarters ending September 30, 2005, up 1.5% from \$1.126 trillion in the June period.

### Operating Cash Flow - \$893.5 billion

The trend in operating cash flow, which includes other income such as interest and dividends, interest paid and income taxes paid, closely followed the trend in core operating cash flow. During the four quarters ended September 30, 2005, the measure reached \$893.5 billion, up 1.7% from \$878.7 billion in the June period.

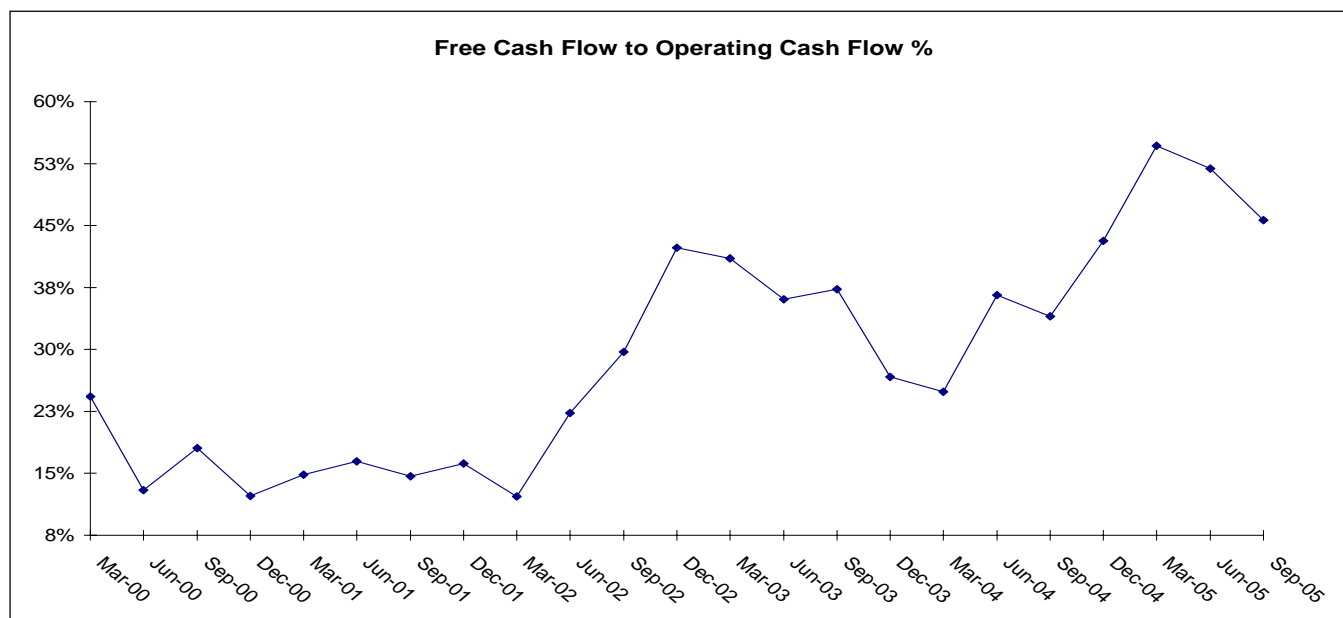
### Free Cash Flow – \$408.2 billion

For free cash flow, we subtracted preferred dividends and capital expenditures from our calculated operating cash flow measure. During the four quarters ended September 30, 2005, the measure reached \$408.2 billion, which was actually down 10.5% from \$456.1 billion in the June period. The reason for the decline was a recent increasing trend in capital expenditures.

For a closer look, in Table 2 we examine the ratio of free cash flow to operating cash flow. An increasing trend for the ratio indicates that firms are reducing capital expenditures. When the ratio declines, capital expenditures are being increased.

As seen in Table 2, the longer-term trend in the ratio of free cash flow to operating cash flow is consistent with the general view that free cash flow had been increased in recent years through reductions in capital expenditures. Free cash flow as a percentage of operating cash flow hit a low of 12% in March, 2002. Because the two measures differ by the amount of disbursements on capital expenditures, the low ratio indicates that businesses were reinvesting much of their operating cash flow. Our latest reading, September 2005, shows free cash flow at 46% of operating cash flow, reflecting a significant reduction in capital expenditures since 2002. Although the metric did hit a high of 55% in March of 2005, it has been trending downward since that time. This new declining trend is significant because it shows that companies are beginning to increase capital expenditures. While an increase in investment spending could provide a boost to the economy in 2006, the net impact will be a reduction in free cash flow.

**Table 2. The Ratio of Free Cash Flow to Operating Cash Flow and the Importance of Capital Expenditures, 2000 – 2005, S&P 500 Non-Financials.**



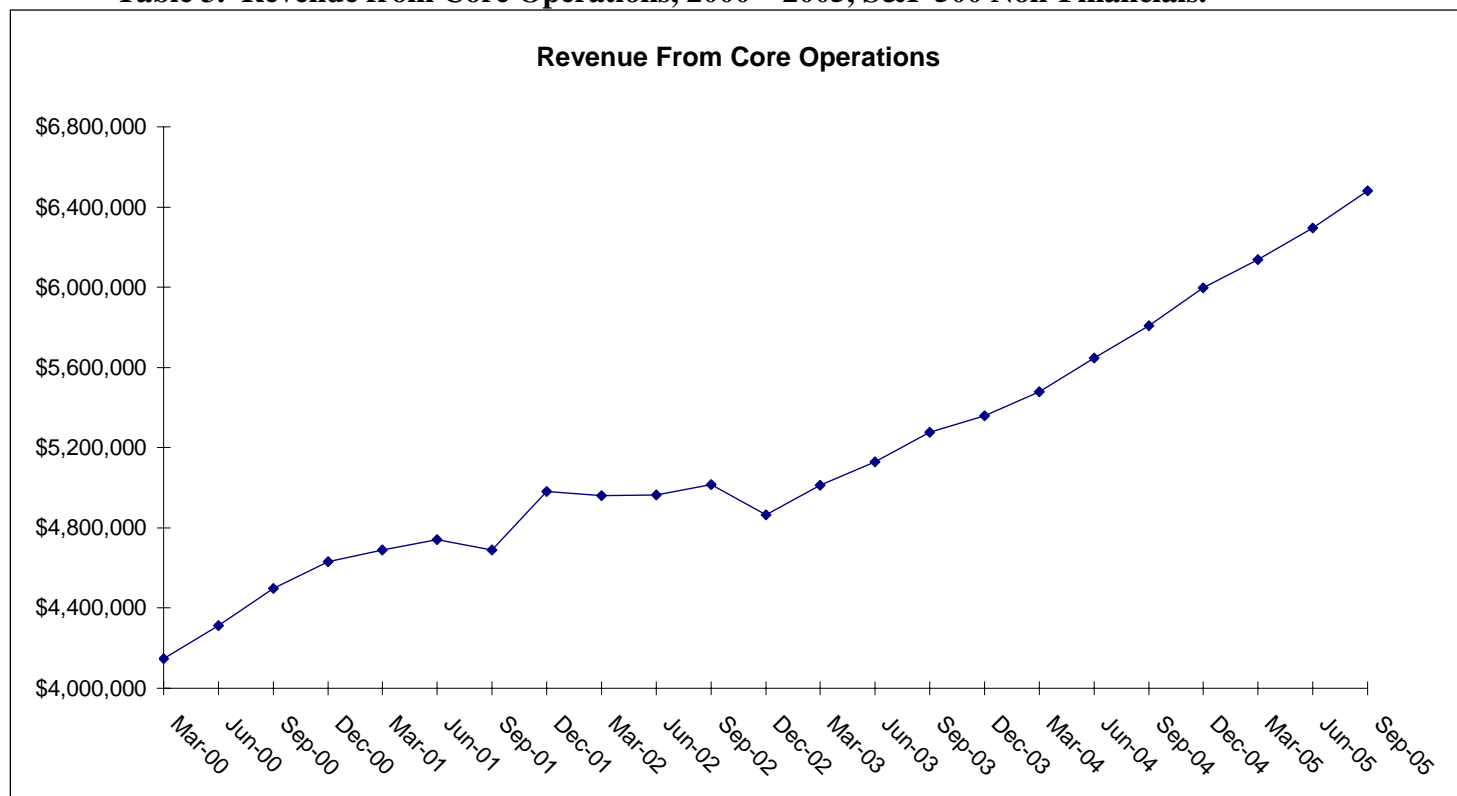
## Cash Flow Drivers

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.

### Revenue - \$6.479 trillion

Revenue has been growing steadily since the December quarter, 2002. During the four quarters ended September 2005, it was up 3.0% to \$6.479 trillion from \$6.294 trillion for the four quarters ended June 2005. While revenue growth boosts earnings, whether or not it boosts cash flow depends on many factors, including the constituent companies' profitability and their operating working capital needs. A graph of revenue from core operations is presented in Table 3.

**Table 3. Revenue from Core Operations, 2000 – 2005, S&P 500 Non-Financials.**

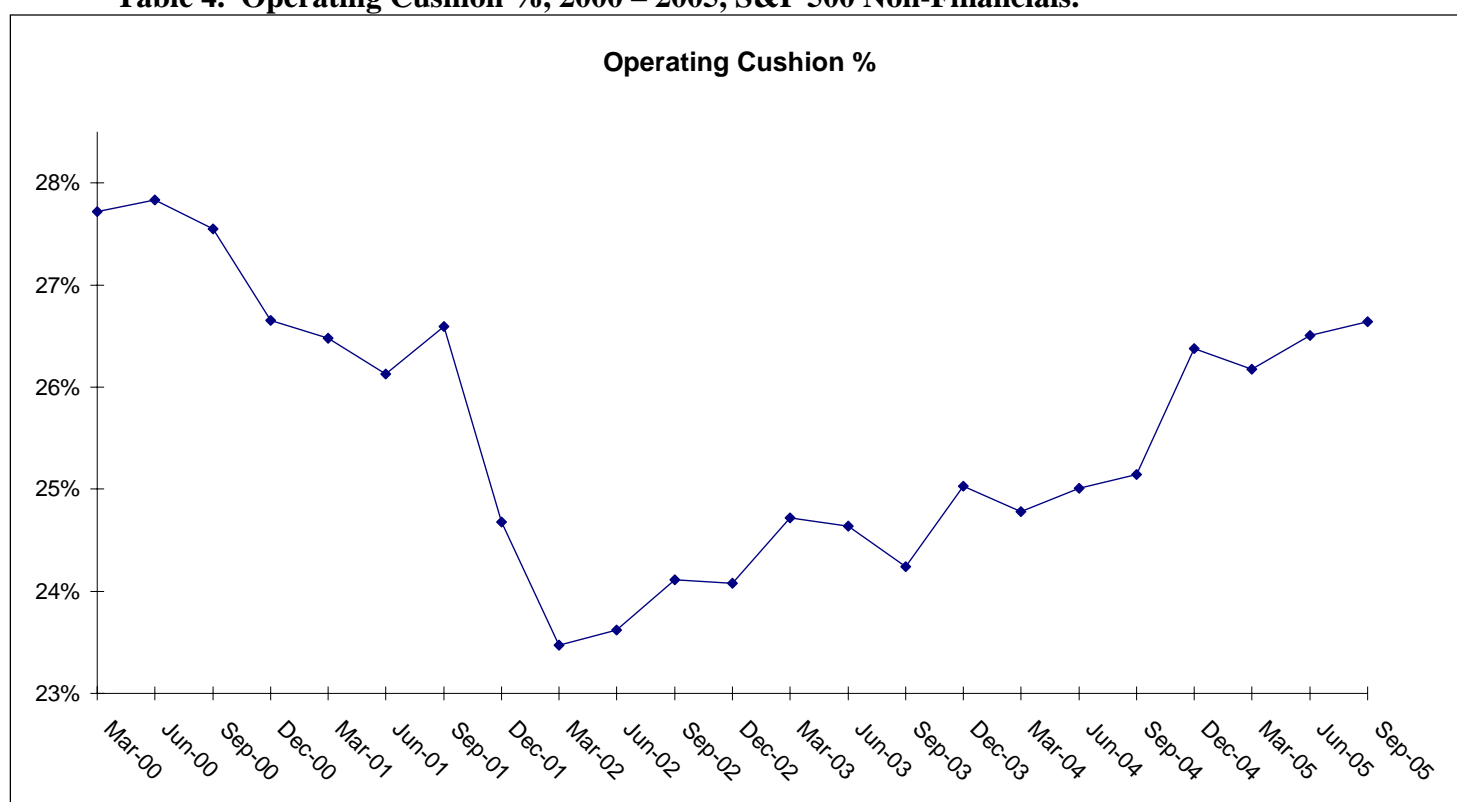


### Operating Cushion – 26%

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. Table 4 presents a graph of the operating cushion %.

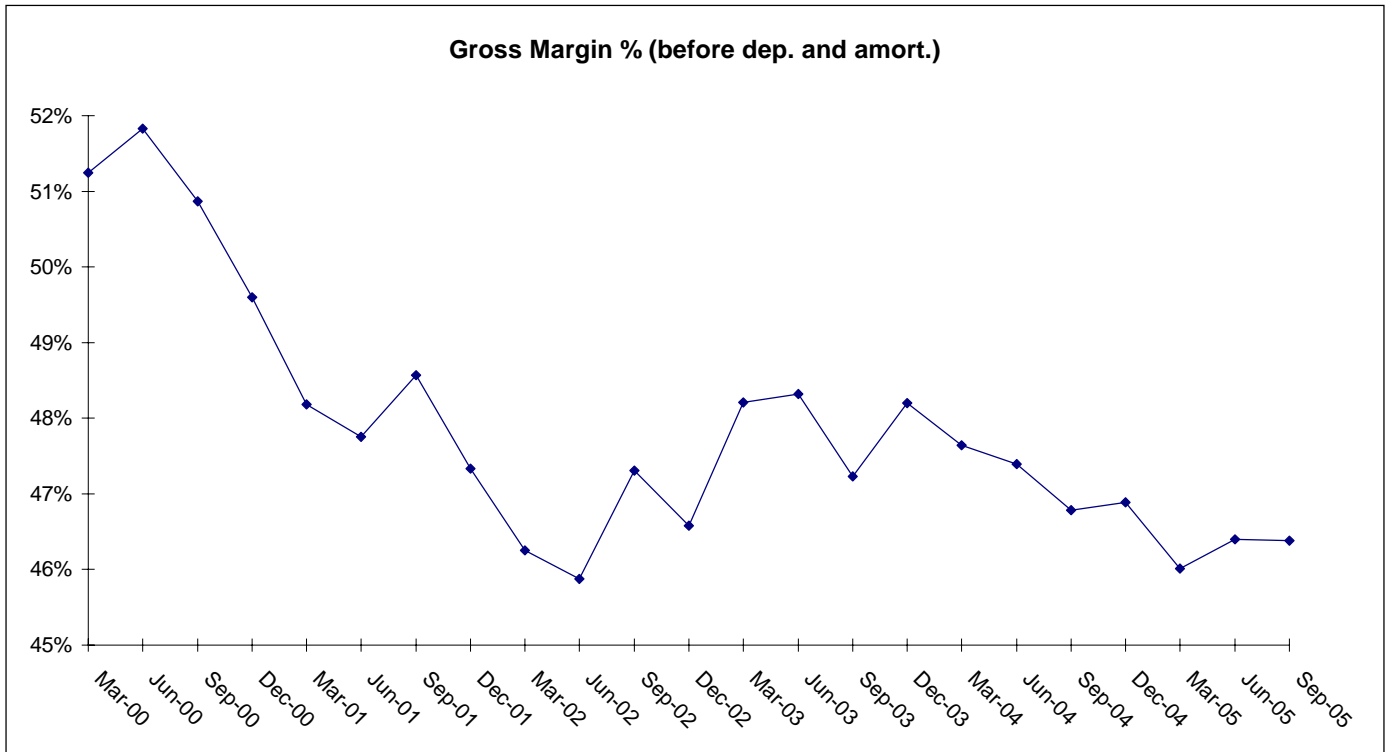
As seen in Table 4, after a marked decline through the March 2002 timeframe, the operating cushion % has been increasing steadily. In the four quarters ending September, 2005, the ratio reached 26.1%, up from 26% in the June 2005 period. The current trend indicates that companies have been improving their cost structure while maintaining growth in revenue.

**Table 4. Operating Cushion %, 2000 – 2005, S&P 500 Non-Financials.**

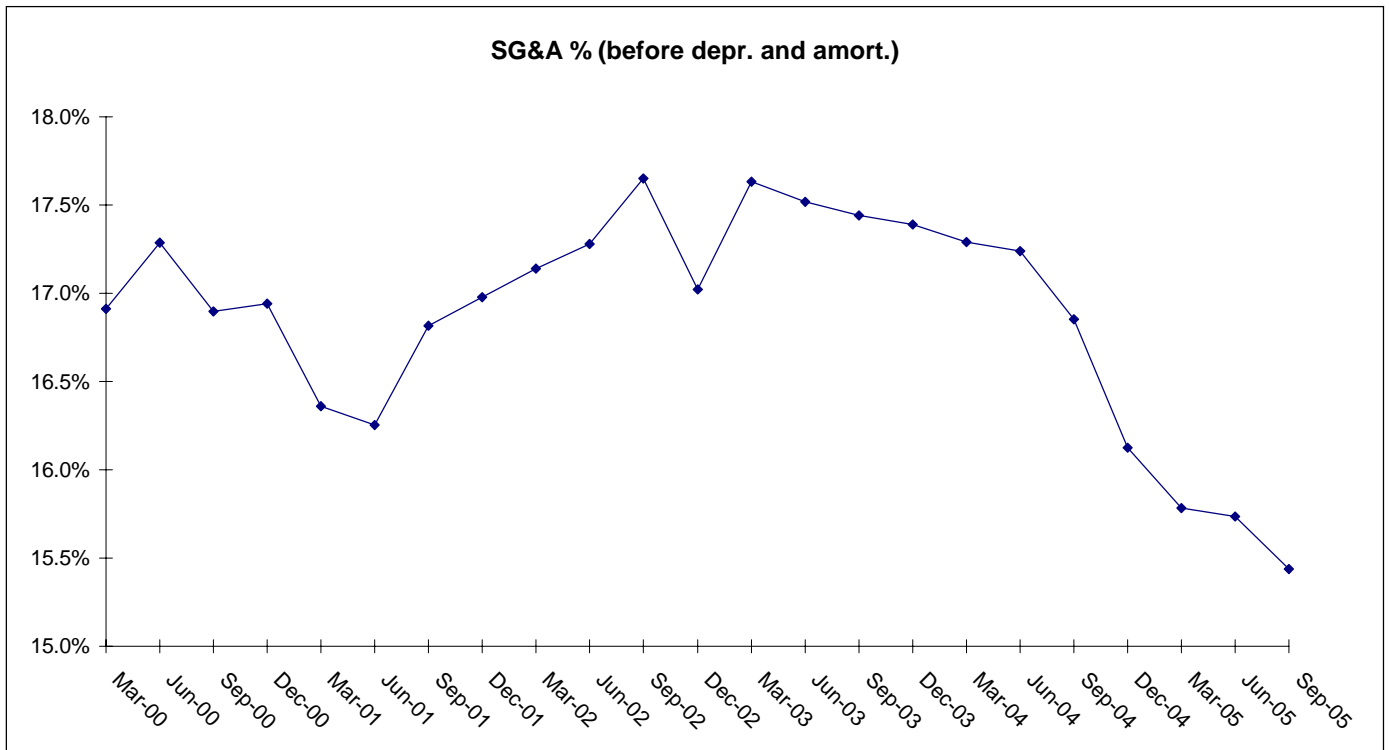


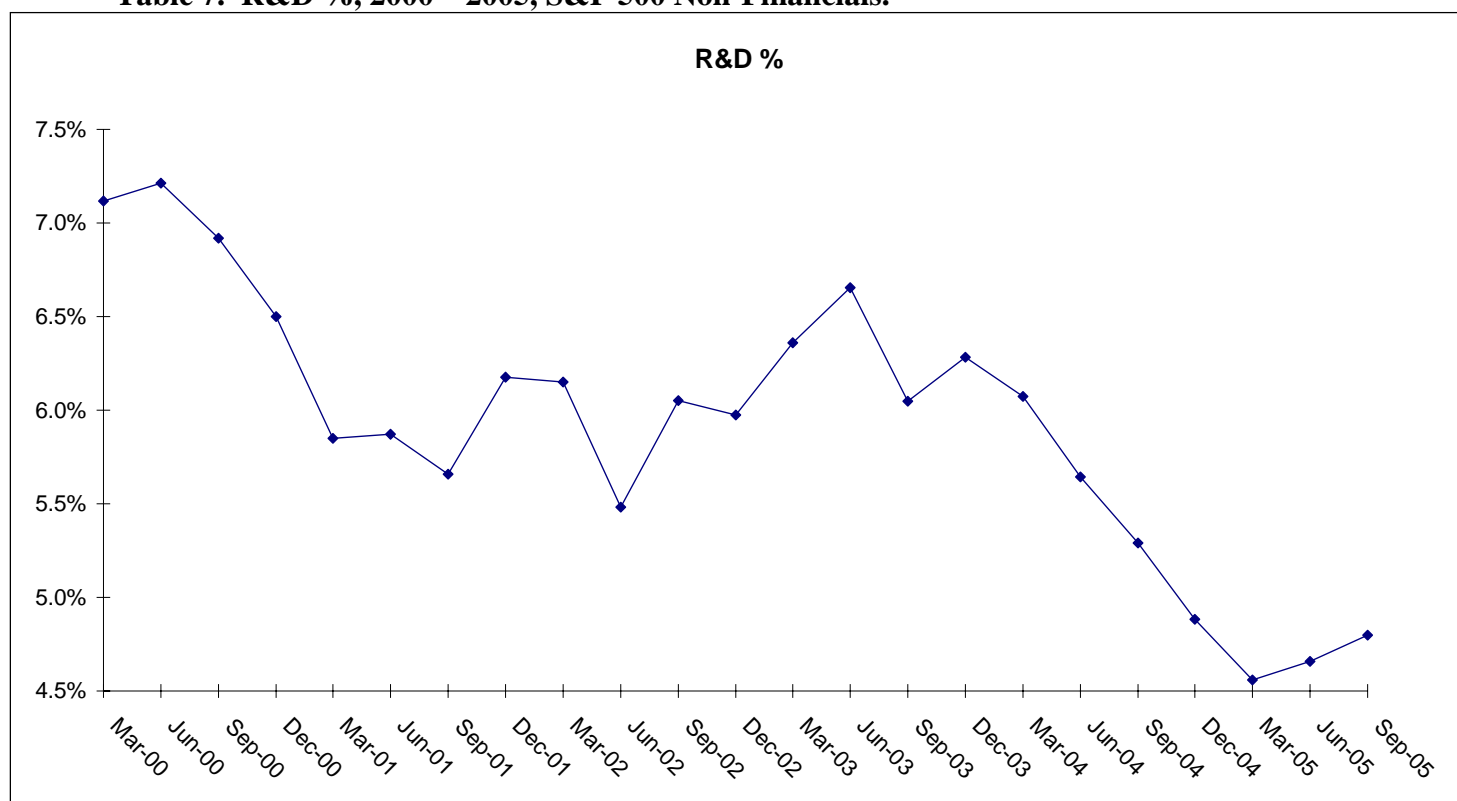
The operating cushion % consists of the gross margin % less the SG&A % and R&D %, all calculated before depreciation and amortization expense. More insight into changes in the operating cushion % can be gained by examining trends in all of its components. Graphs of the component measures are presented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

**Table 5. Gross Margin % (before depreciation and amortization expense), 2000 – 2005, S&P 500 Non-Financials.**



**Table 6. SG&A % (before depreciation and amortization), 2000 – 2005, S&P 500 Non-Financials.**



**Table 7. R&D %, 2000 – 2005, S&P 500 Non-Financials.**

In examining Tables 5, 6 and 7 we see that the improving trend in the operating cushion % since the March 2002 time period is being driven mostly by declines in SG&A and R&D %'s. As seen in Table 6, we see a significant decline in SG&A expense spending that has continued since the four quarters ending March 2003. R&D % has been trending downwards since the four quarters ending June of 2003. However, R&D % has been increasing since the March of 2005.

Gross margins have been flat since 2002. The % did rise to 48% from a low of 46% in June of 2002 although it has settled back to 46% since that time.

### 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 Table 8.

**Table 8. Cash Cycle, 2000 – 2005, S&P 500 Non-Financials.**

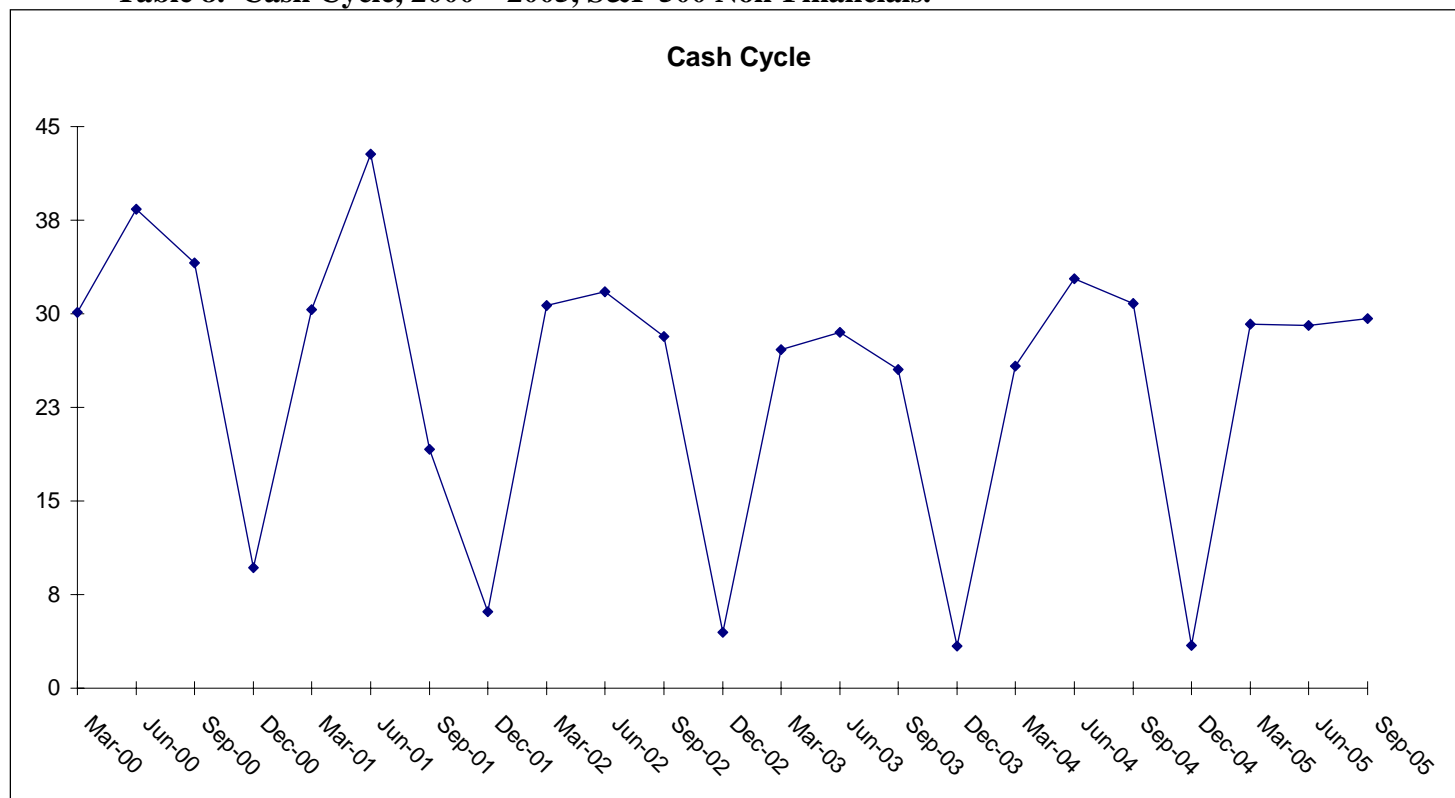
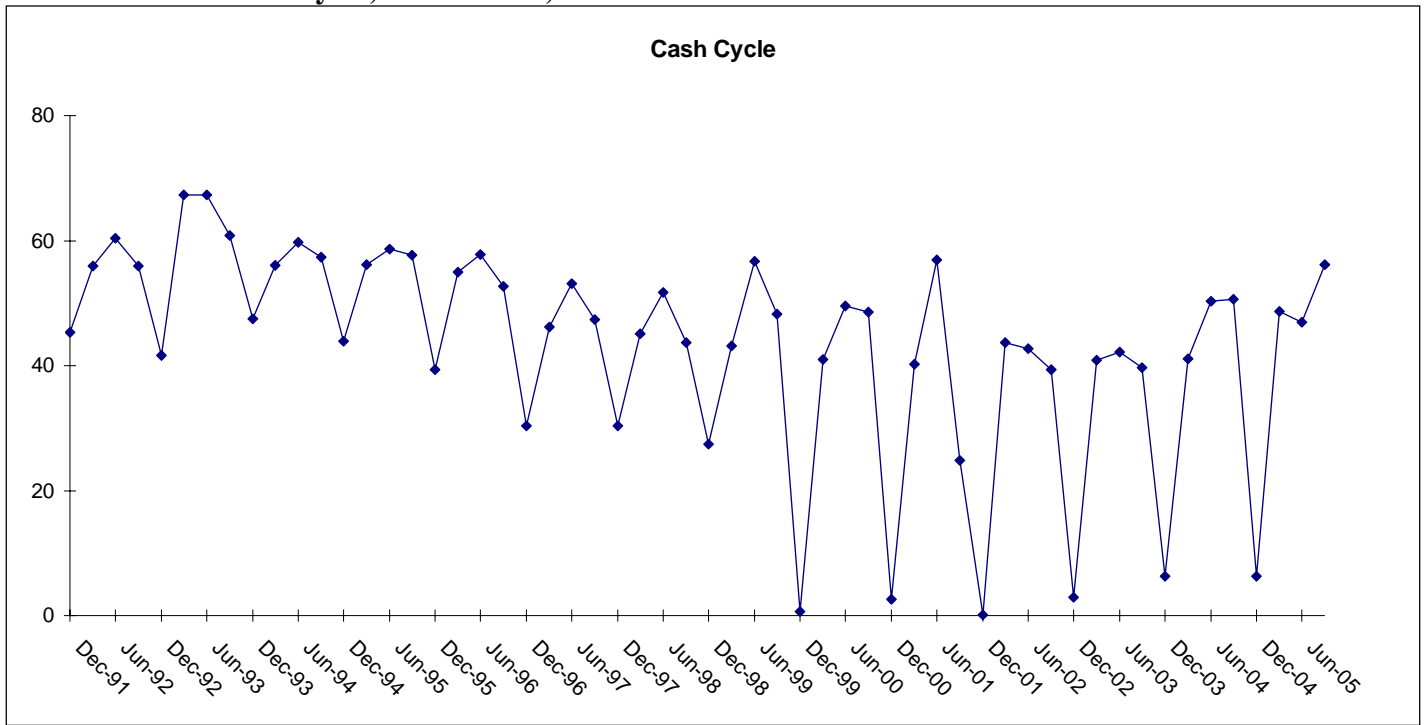


Table 8 shows a very strong seasonal effect to companies' management of operating working capital. Working capital is at its lowest and firms are most liquid with each four-quarter period ending in December. In June, companies have much more cash invested in working capital. Seasonal effects notwithstanding, however, Table 8 does show a slight downward trend in the cash cycle of the non-financial firms in the S&P 500. This trend is most prominent by examining the data as of December of each year. From 9.6 days in December 2000, the cash cycle trended downward to 3.4 days in December 2004. This improving trend adds to the groups' ability to generate core operating cash flow. Whether the trend will continue into the December 2005 timeframe remains to be seen.

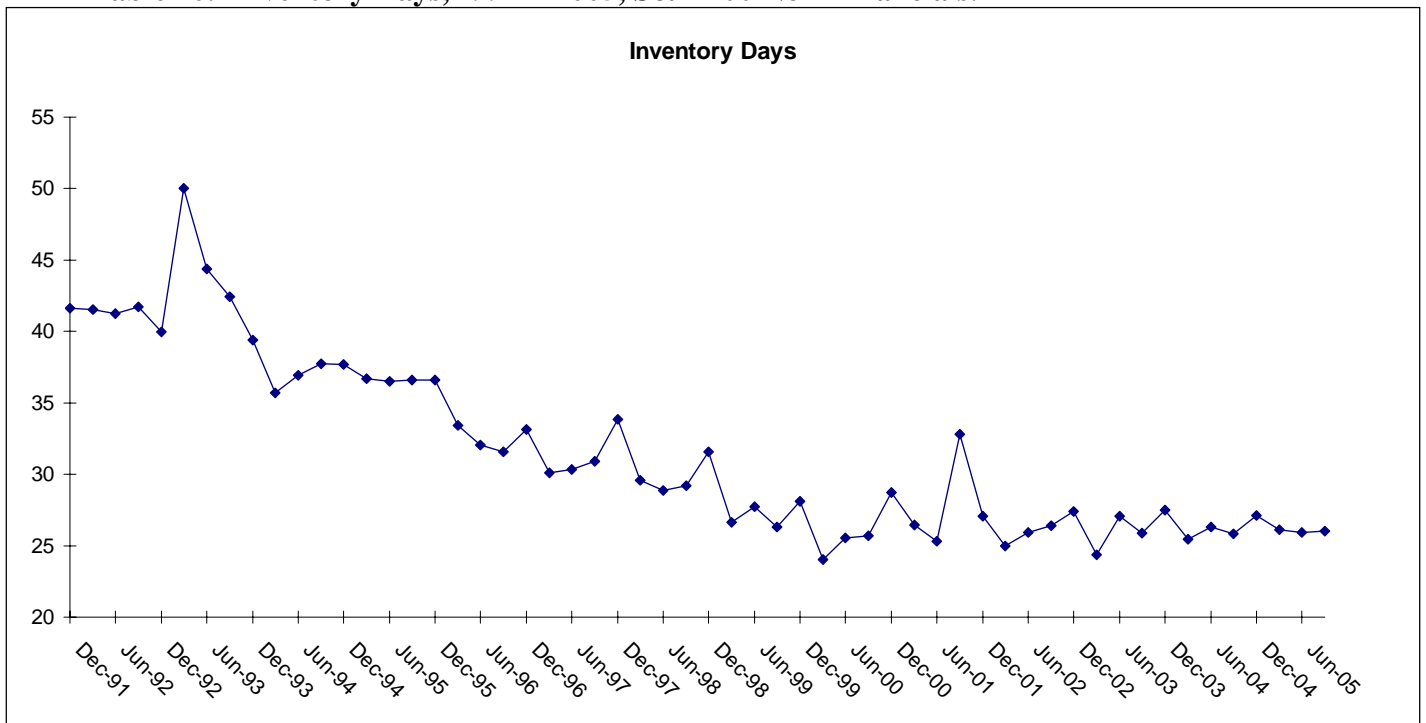
For a longer-term perspective on the trend in the cash cycle, we looked at similar data for the non-financials in the S&P 100. We have much more data for this group, dating back to December 1991. In Tables 9, 10, 11 and 12 we present a time series graph of the cash cycle, of

inventory days, receivables days and payable days, respectively, for the non-financials of the S&P 100.

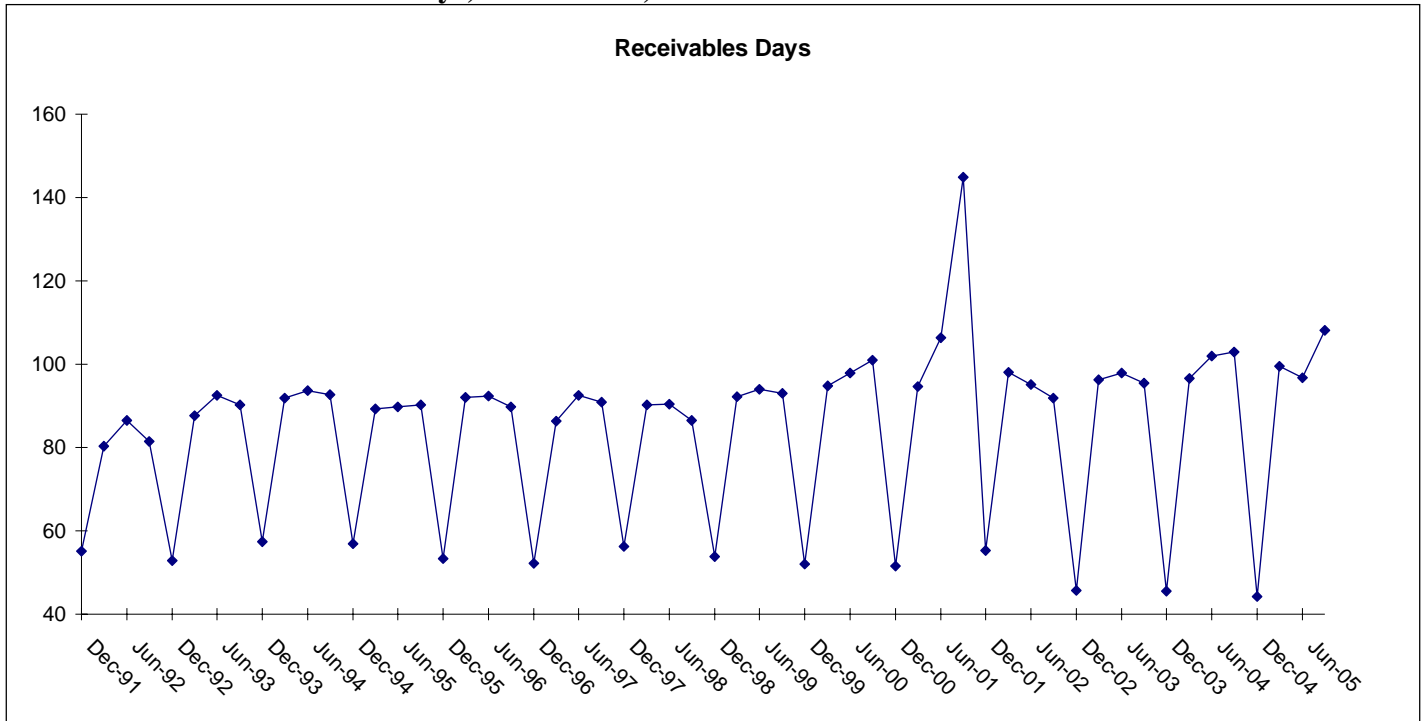
**Table 9. Cash Cycle, 1991 – 2005, S&P 100 Non-Financials.**



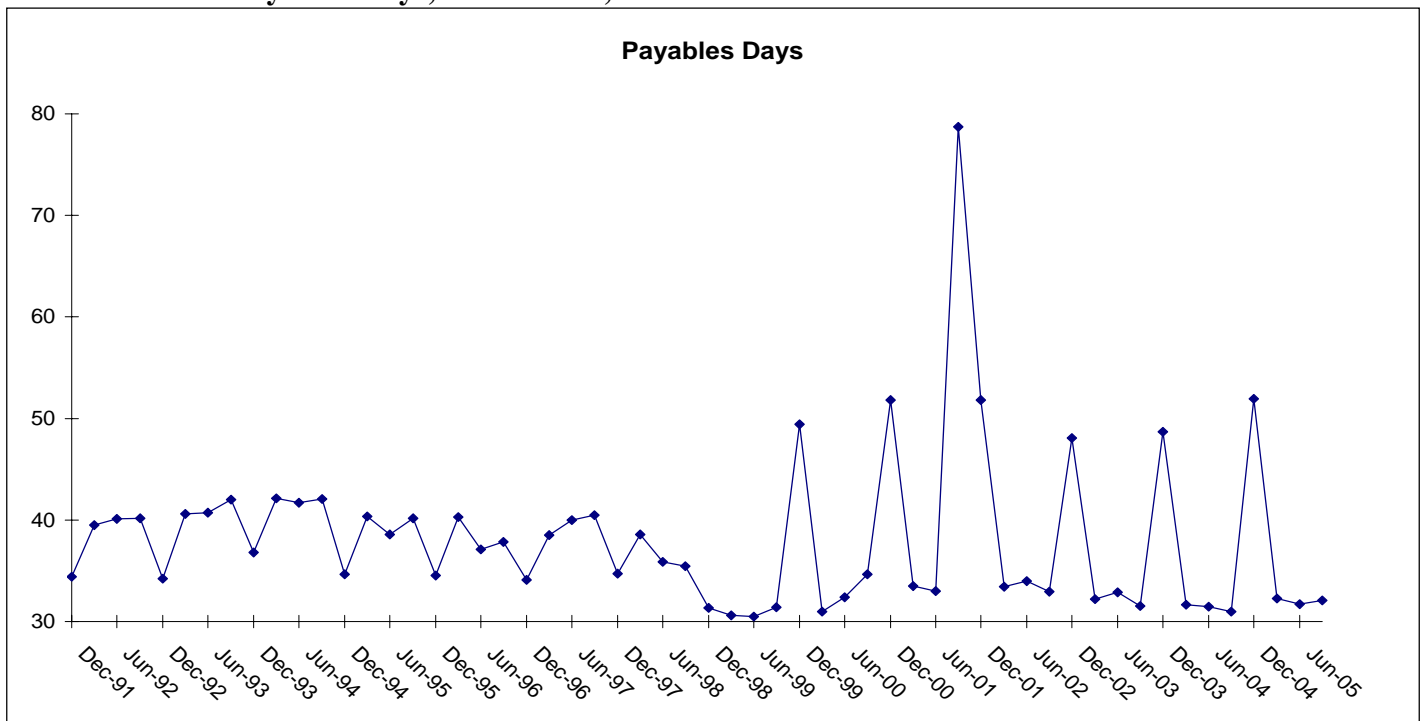
**Table 10. Inventory Days, 1991 – 2005, S&P 100 Non-Financials.**



**Table 11. Receivables Days, 1991 – 2005, S&P 100 Non-Financials.**



**Table 12. Payables Days, 1991 – 2005, S&P 100 Non-Financials.**



In Table 9, we present the cash cycle for the non-financials in the S&P 100. As can be seen in the Table, the seasonal nature of the cash cycle is still very evident. Also, the downward trend in the cash cycle that we saw for the S&P 500 is more evident in the period 1991 through 1999 for the

S&P 100. In fact, since 2000, the cash cycle has trended up slightly, increasing to 6.3 days in December 2004 from 2.6 days in December 2000. Given this development, it could be argued that in the future, our broader cross-section of firms, the S&P 500, may have difficulty in continuing to improve their cash cycle.

In Tables 10, 11 and 12 we look at important components of the cash cycle for the S&P 100. Note that the improvement in the cash cycle between 1991 and 1999 was driven strongly by improvements in inventory days as firms sought and found efficiencies in their supply chain. Since that time, however, continued improvements have not been as evident within this group of firms.

In Tables 11 and 12, we look at two other components of the cash cycle for the S&P 100, receivables days and payables days. Both measures are strongly seasonal and tend to be at high or low points in December, depending on what is most favorable for the company. Receivables days have trended downward slightly since 1991, declining to 44.3 days in December 2004 from 55.2 days in December 1991. Payables days show a significant increase during the period.

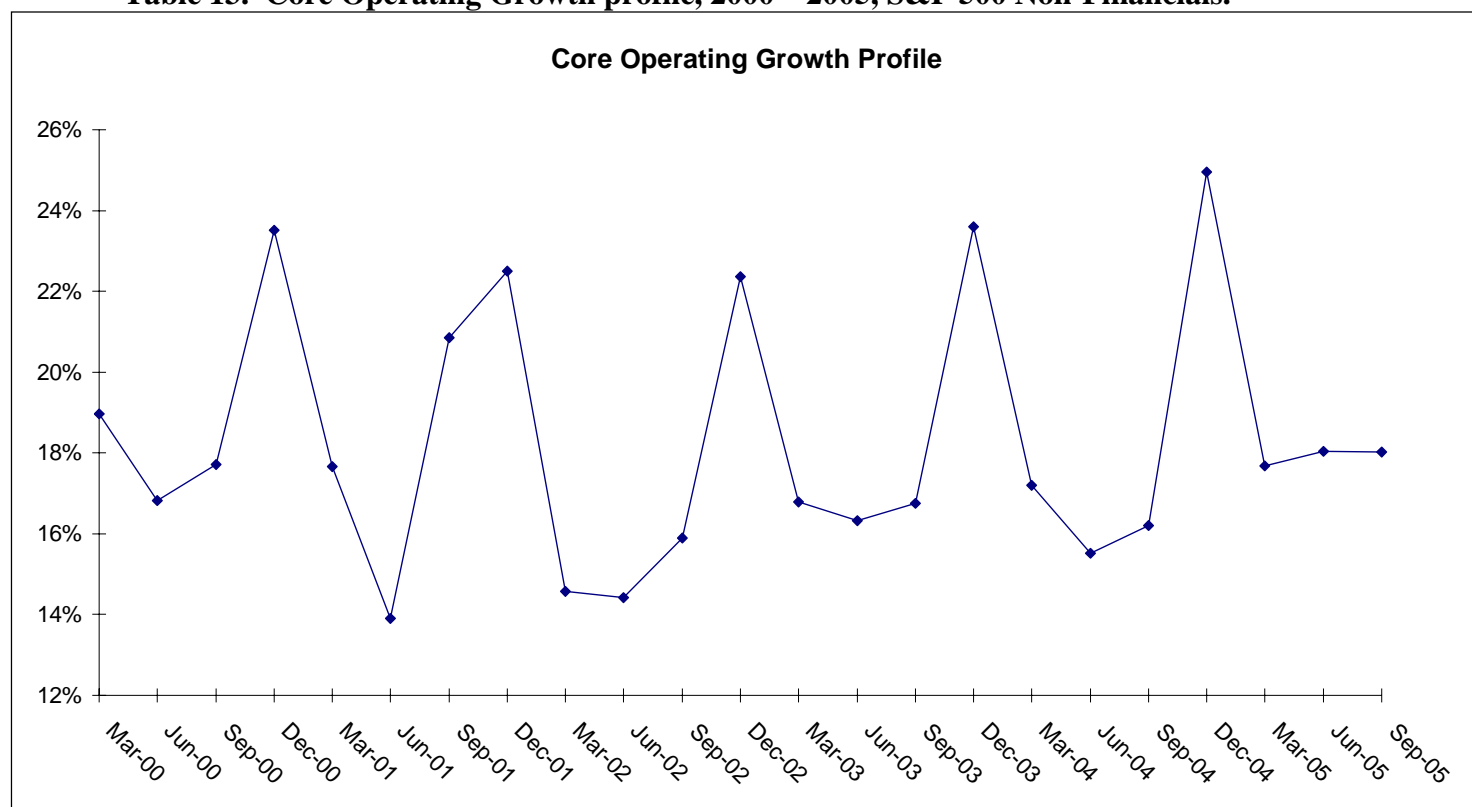
### Core Operating Growth Profile

The core operating growth profile combines operating cushion % and operating working capital needs, expressed as operating working capital to revenue %, into a single metric. The metric expresses in percentage terms the expected contribution to core operating cash flow of each revenue dollar *growth* in revenue. For example, a core operating growth profile of 3.5% indicates that for every dollar growth in revenue, core operating cash flow is expected to increase by 3.5 cents.

Often we think that growth requires investments of cash. In this manner of thinking, the faster a company grows, the more core operating cash flow it will consume. That is not true, however, for firms with a positive core operating growth profile, where growth will increase cash flow, not reduce it.

Table 13 presents core operating growth profile for the S&P 500 non-financials over the 2000 – 2005 time period. It is most instructive to examine the Table at December of each year. As can be seen, the core operating growth profile declined to 22% in December 2002 from 24% in December 2000. However, it has increased since 2002, rising to 25% at December 2004.

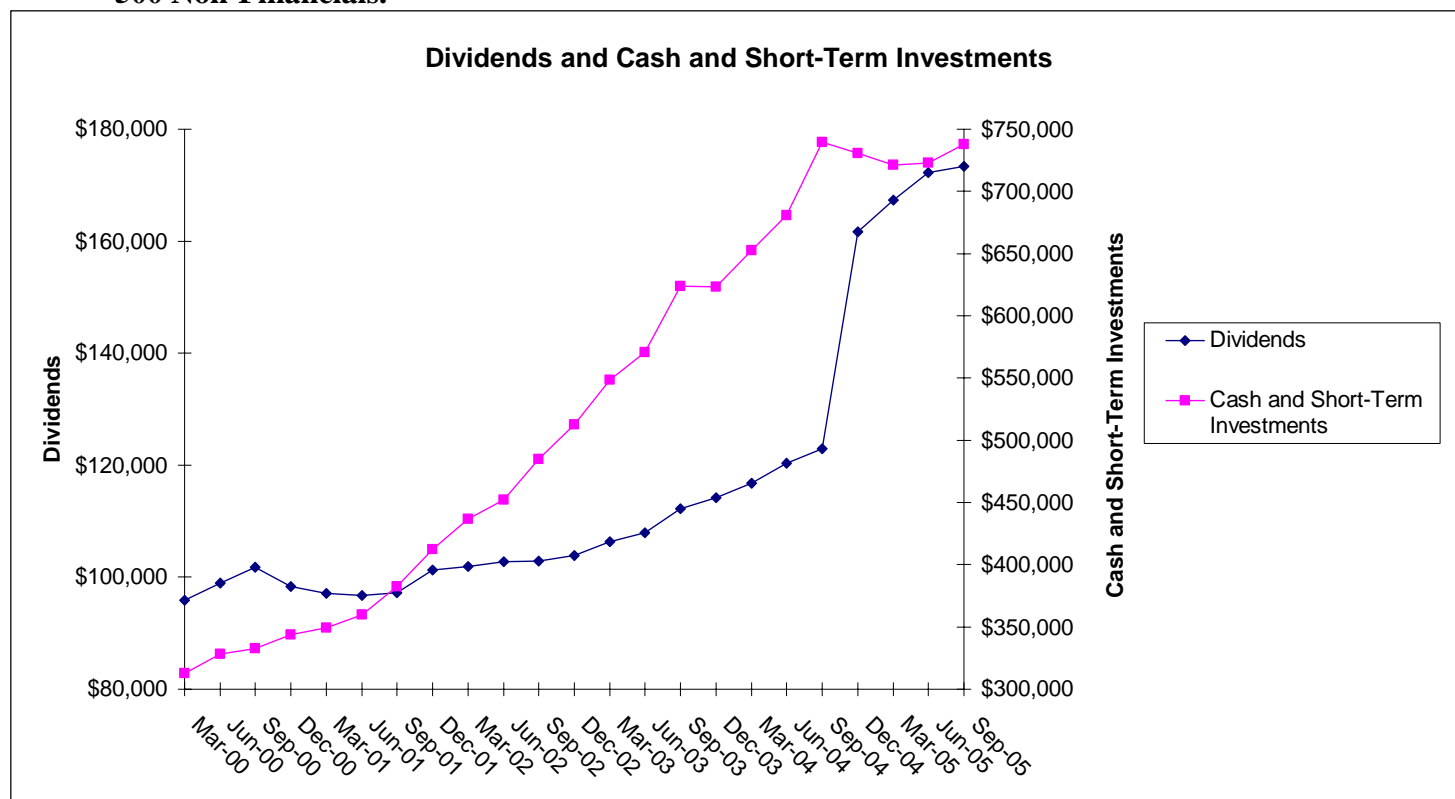
**Table 13. Core Operating Growth profile, 2000 – 2005, S&P 500 Non-Financials.**



## Cash Flow, Dividends and Valuation

In Table 14, we look at trends in dividends paid on common stock and balances in cash and short-term investments.

**Table 14. Dividends and Balances in Cash and Short-Term Investments, 2000 – 2005, S&P 500 Non-Financials.**

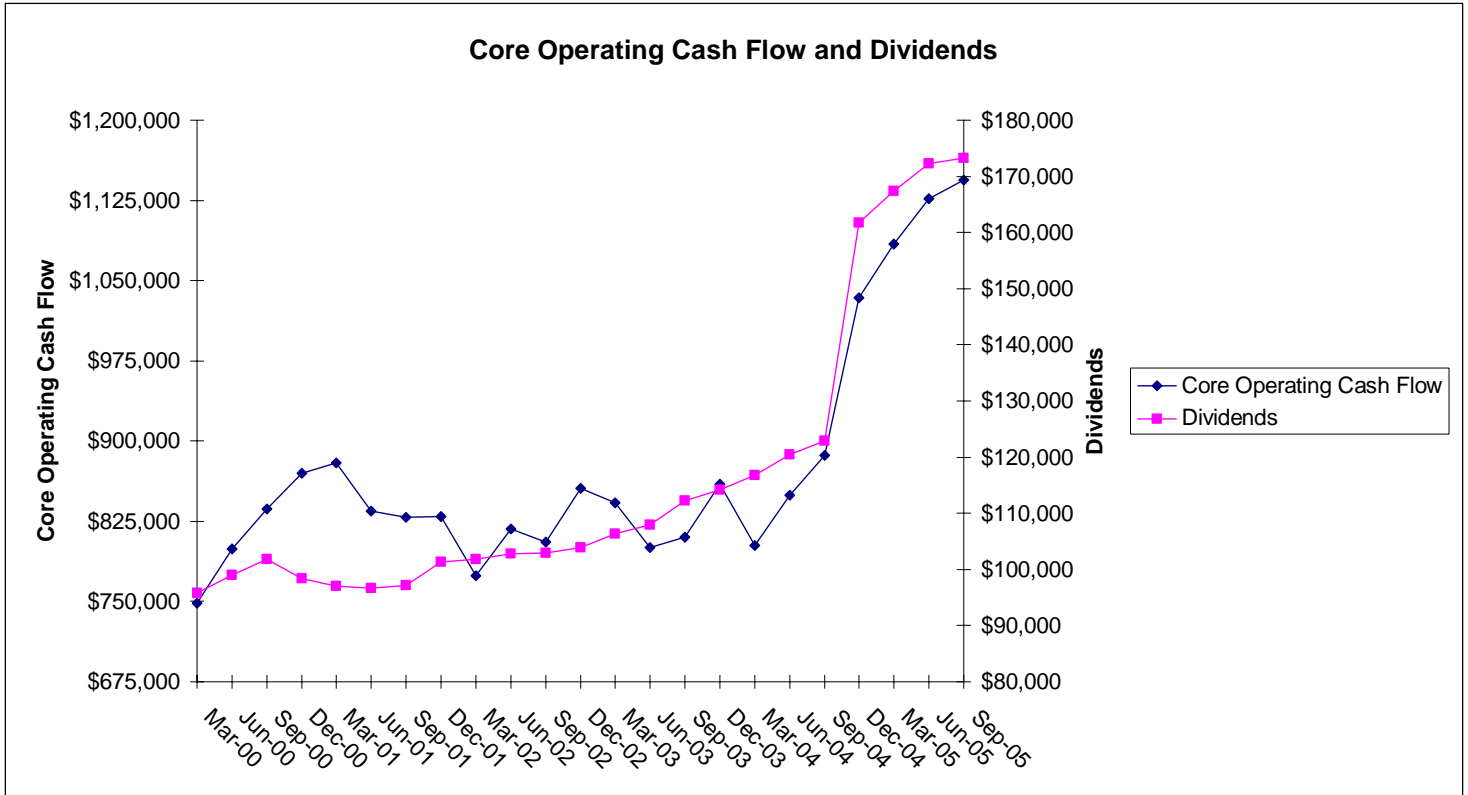


As seen in Table 14, dividends have been rising steadily since the four quarters ending June 2001. The measure jumped at the end of 2004 as companies began to distribute significantly more cash to shareholders. Favorable tax policy and a build up of cash and short-term investments likely contributed to the increased payout. Dividends reached \$173.3 billion in the four quarters ending September 2005, up .6% from \$172.2 billion during the four quarters ending June 2005.

Along with free cash flow, cash on hand and short-term investments have increased over the time period studied. The total reached \$737.8 billion as of September 30, 2005, up 2.1% from \$722.6 billion at June 30, 2005 and up 136% from \$312.7 billion at March 2000. How this increase in cash and investments translates into future capital expenditures, dividend increases, stock buybacks and acquisitions remains to be seen.

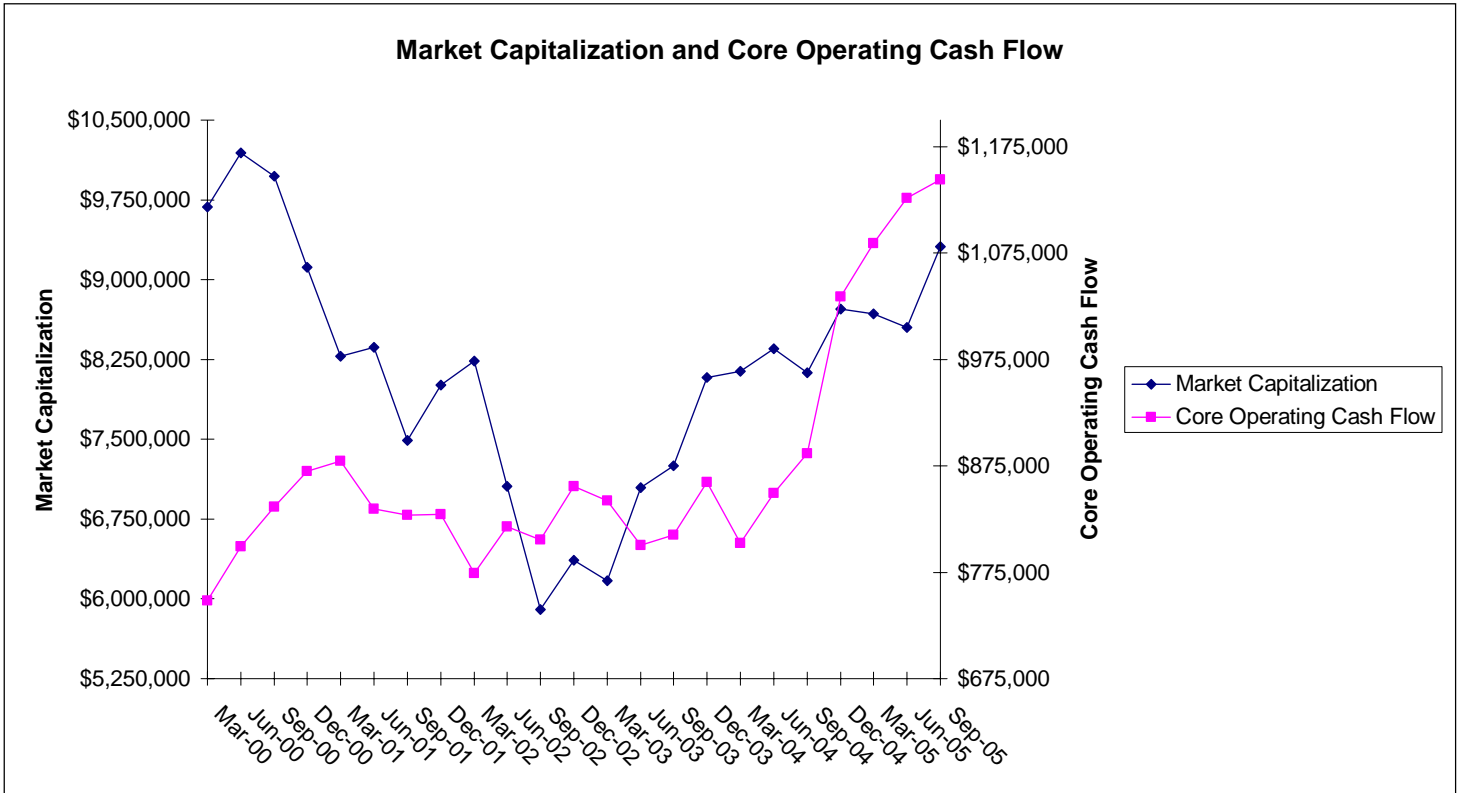
One way to watch for future dividend increases is to follow growth in core operating cash flow. We find a very high correlation, .94, between the two measures over the five-year time period studied. A graph that presents the two measures, presented as Table 15, is particularly compelling.

**Table 15. Core Operating Cash Flow and Dividends Paid, 2000 – 2005, S&P 500 Non-Financials.**



In Tables 16 and 17, we present time series data on market capitalization and core operating cash flow for the S&P 500 and S&P 100, respectively.

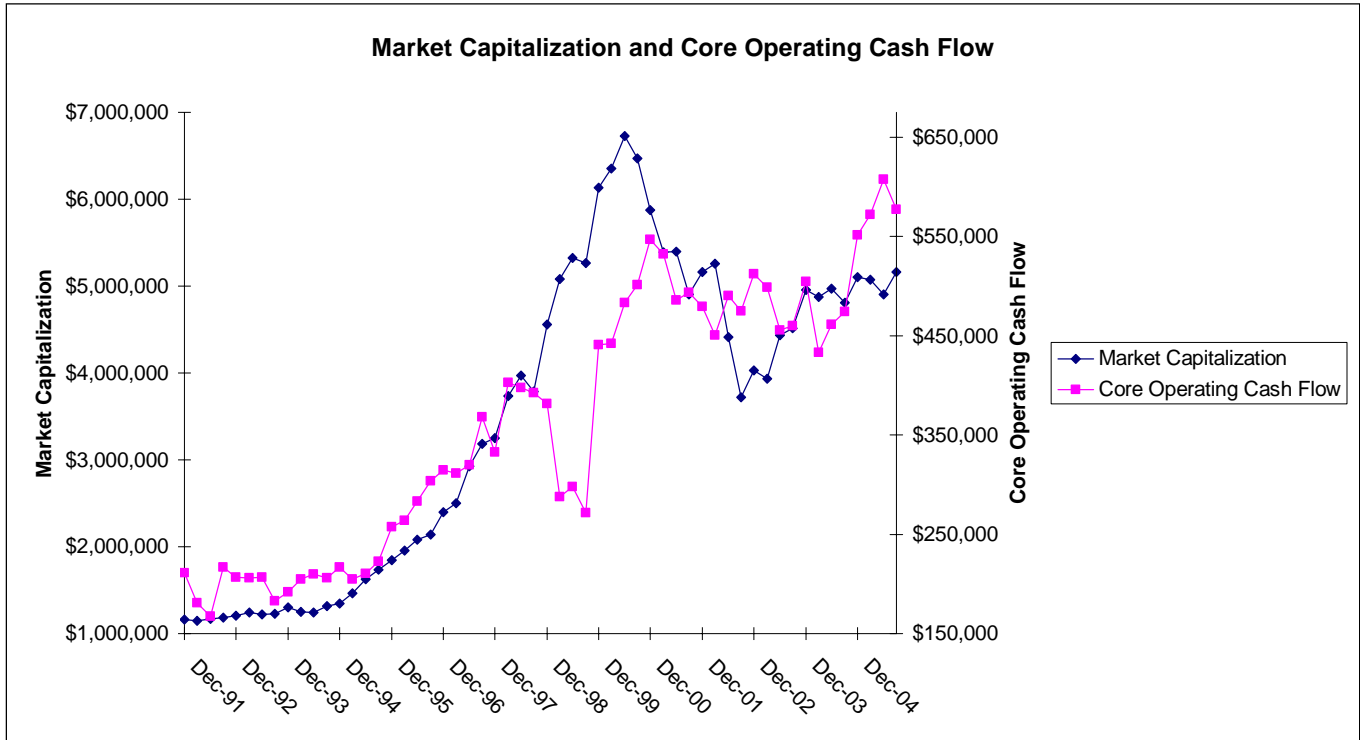
**Table 16. Market Capitalization and Core Operating Cash Flow, 2000 – 2005, S&P 500 Non-Financials.**



Market capitalization for the sample grew to \$9.308 trillion as of September 30, 2005, up 8.8% from \$8.553 trillion at June 30, 2005. While a strong correlation between market capitalization and core operating cash flow is evident from September 2002 forward, a correlation between the two is essentially nonexistent between March 2000 and September 2002 as market worked off the excesses that developed in the late 1990s and into 2000.

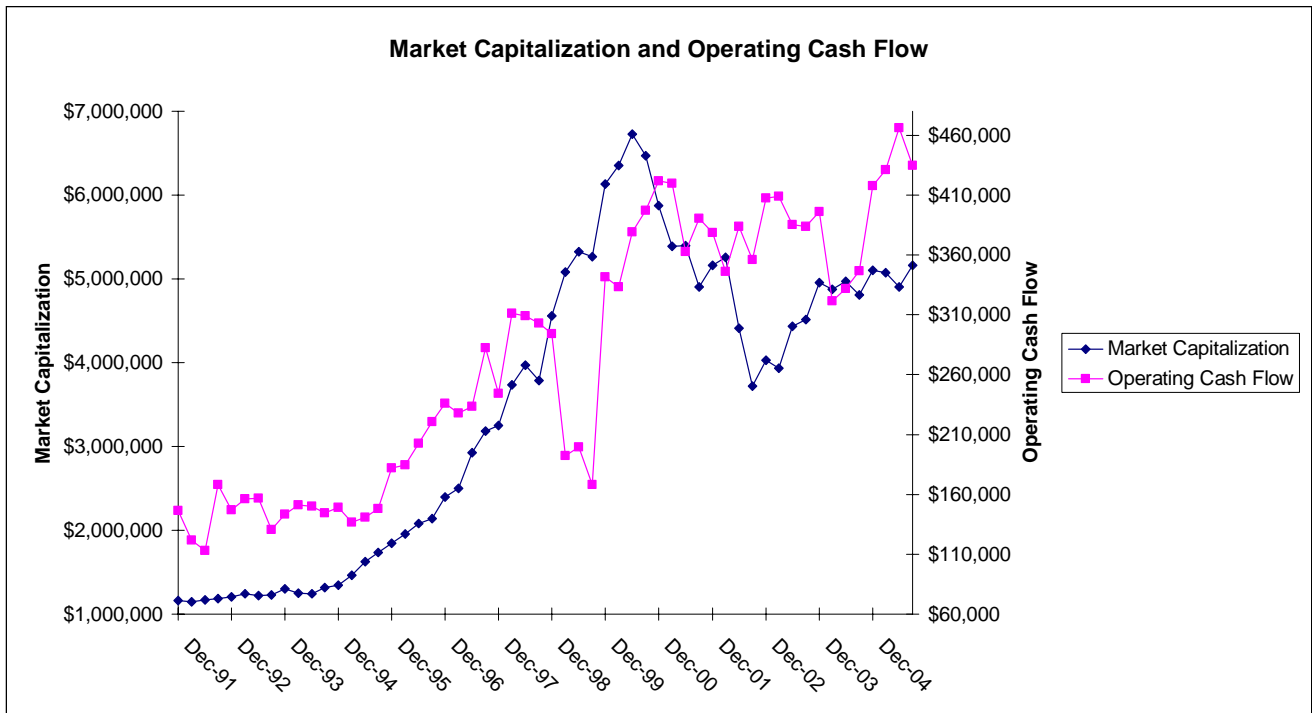
In Table 17, we look at the longer term using data for the non-financials of the S&P 100. There is a correlation of .86 between core operating cash flow and market capitalization over that longer time horizon. Here the excesses that developed in the late 1990s are apparent as market capitalization appeared to become "disconnected" from the fundamentals of core operating cash flow after 1996.

**Table 17. Market Capitalization and Core Operating Cash Flow, 1991 – 2005, S&P 100 Non-Financials.**

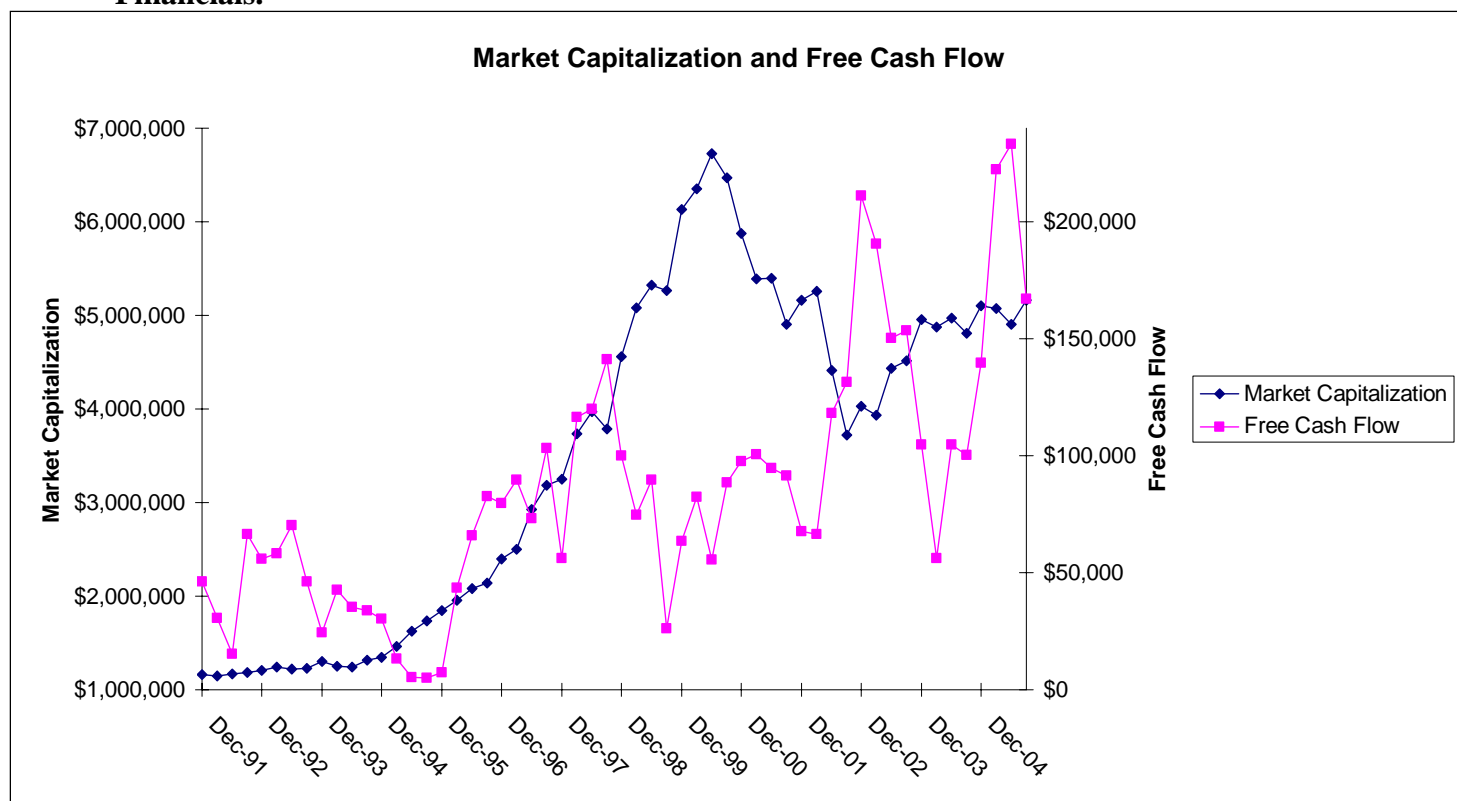


In Table 18, we present data on market capitalization and operating cash flow for the non-financials of the S&P 100. The correlation here is also very strong over the 1991 – 2005 time period, .83.

**Table 18. Market Capitalization and Operating Cash Flow, 1991 – 2005, S&P 100 Non-Financials.**



Cash Flow Trends and Their Fundamental Drivers: A Study of the S&P 500 Non-Financials. February, 2006  
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**Table 19. Market Capitalization and Free Cash Flow, 1991 – 2005, S&P 100 Non-Financials.**

Finally, in Table 19 we look at the relationship between free cash flow and market capitalization for the non-financials of the S&P 100 over the 1991 – 2005 time period. Recall that the difference between operating cash flow and free cash flow is capital expenditures, which are included in the calculation of the latter. Here, at .51, the correlation is lower than with core operating cash flow and operating cash flow. The discretionary and volatile nature of capital expenditures would appear to explain the difference. While free cash flow is discretionary cash flow available for shareholders, investors and analysts appear to recognize that other measures of cash flow, in particular core operating cash flow and operating cash flow, are more important drivers of firm value.

## Summary

In terms of cash flow, corporate performance for the S&P 500 non-financials has been improving since March of 2004. There has been stable top line growth as well as increased business efficiency, which helped to increase cash flow. This improvement in performance has led to huge increases in cash reserves and is having an impact on the decisions business executives are making. Investors are one of the beneficiaries as dividend payouts have increased sharply in recent periods.

Business leaders have also upped spending as evidence indicates an increase in capital expenditures. This is a welcome finding for the U.S. business environment as consumers have been carrying the economy for several years. A negative savings rate is often cited as one of the

indicators that consumers have been stretched to the limit. A continuing ramp up in business spending could offset a decline in consumer spending.

Several other findings include a high correlation between stock market performance and core operating cash flow. This shows a strong link between business fundamentals and stock market performance. This finding also highlights the excesses of the stock market bubble. It shows how disconnected stock prices were from the underlying corporate performance. Another strong relationship was between dividends and core operating cash flow.

It is quite difficult to predict where corporate performance and the stock market will proceed from here. Several implications from our findings are salient in our view. First, balance sheets are still very strong as companies are holding huge sums of cash. Corporations will continue to spend cash on dividends and capital expenditures in the coming quarters. Secondly, companies have benefited from increased efficiency and decreased spending in inventory, SG&A, and use of net working capital. This indicates good performance but also implies a tougher environment going forward. Companies cannot continue to lower spending on SG&A or inventory into the future as extremely low levels of spending in these areas are not sustainable and will hurt corporate performance. Businesses will not be able to rely on these areas to improve performance. Corporations will have to find a new catalyst to increase sustainable cash flow in the future – revenue and earnings growth would appear to be the only reliable candidates.