

# Investing for Growth: Capex and R&D

## Capex and R&D forecasted to fall in 2009-2010

We forecast S&P 500 capex will drop by 22% in 2009 and by 15% in 2010. The 34% decline from peak would represent the most significant decline in 25 years and implies that spending next year will return to 2004 levels. Bottom-up analysts expect an 18% fall and a 2% rise.

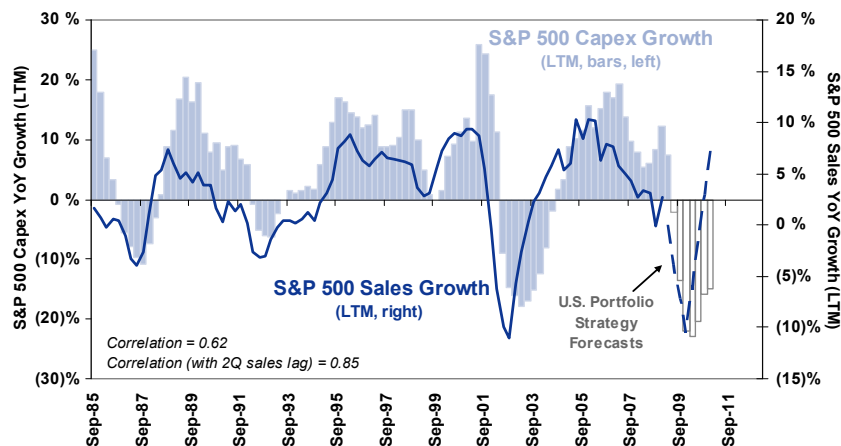
## Sales growth leads capex which drives returns

S&P 500 sales growth is highly correlated with GDP growth and consistently leads capex growth by two quarters. We find firms that have high levels of reinvestment (as measured by capex/depreciation ratio) generate faster sales growth than firms with low reinvestment ratios. Over the next two quarters, investors will shift their focus from cost-cutting to sales growth. Firms that are reinvesting in their business via capex and R&D will differentiate themselves from their competitors, produce better top-line results, and should be rewarded by investors.

## Buy companies that are investing for growth

We recommend investors buy our Invest for Growth basket (Bloomberg ticker <GSTHINVG>). The 50-stock basket is sector-neutral vs. the S&P 500 and contains firms with the highest capex/depreciation ratios in each sector. We also include R&D spending as part of the reinvestment ratio for Health Care and Information Technology sectors.

### We forecast S&P 500 Capex will fall by 22% in 2009 and 15% in 2010



Source: Compustat and Goldman Sachs Global ECS Research.

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We thank Christopher Cerrone for his contribution to this report.

## Buy companies that are investing for growth

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**1. We favor companies that invest for growth through capex and R&D relative to the broader market.** This report explores how capex relates to revenue growth and how investors might incorporate a firm's re-investment strategy into a stock selection process. Corporate capital usage in the form of capex, R&D, dividends, buybacks, and cash M&A will be depressed in 2009 and 2010. Firms that continue to invest in their businesses can develop new products, streamline manufacturing processes, and gain market share. We expect companies that continue to invest in capex and R&D will be rewarded by investors.

**2. Capex spending cycles roughly coincide with business cycles.** Since 1967, each capex trough has corresponded with an economic recession. While each capex cycle has been unique in duration and in magnitude, the cycles have generally reflected the length and depth of the concurrent business cycle. The current cycle, which corresponds with the most severe recession in the post-WWII period, also marks the steepest decline in capex. Capex growth has traditionally lagged GDP growth by 1-2 quarters.

**3. Firms' decisions regarding the quantity and timing of capital expenditures are determined by two primary factors: (1) anticipated end-market demand; and, (2) the cost of financing capital investments.** Our analysis of S&P 500 capex spending behavior since 1985 reveals that capex is highly correlated with sales. In general, we see capex respond to sales after a 1-2 quarter lag. We consider sales growth to be the best real-time indicator of end-market demand for most companies and believe management teams look at sales trends to make projections regarding future business prospects. This lag between sales growth and capex growth suggests that firms wait to see validation of sales trends before committing to long-term investment projects.

**4. We forecast S&P 500 capex will fall by 22% in 2009 and by 15% in 2010 and S&P 500 R&D will fall by 9% in 2009 and by 15% in 2010.** Our capex forecasts represent the most significant decline in capex spending in the 25 years for which data is available and imply that by the end of 2010 capex spending for the S&P 500 will return to 2004 levels. Our R&D forecasts imply that by the end of 2010, S&P 500 R&D will return to 2005 levels. We model capex and R&D on the basis of their historical relationship to key macro and micro drivers including the cost of credit, sales, US GDP, capacity utilization, and recent capex spending.

**5. Research & Development is a critical component of corporate investment in addition to capex.** In addition to the \$566 billion S&P 500 firms spent on capex in 2008, companies invested \$192 billion in R&D. Health Care and Information Technology invest for growth more through R&D than capex and account for 70% of total R&D spending.

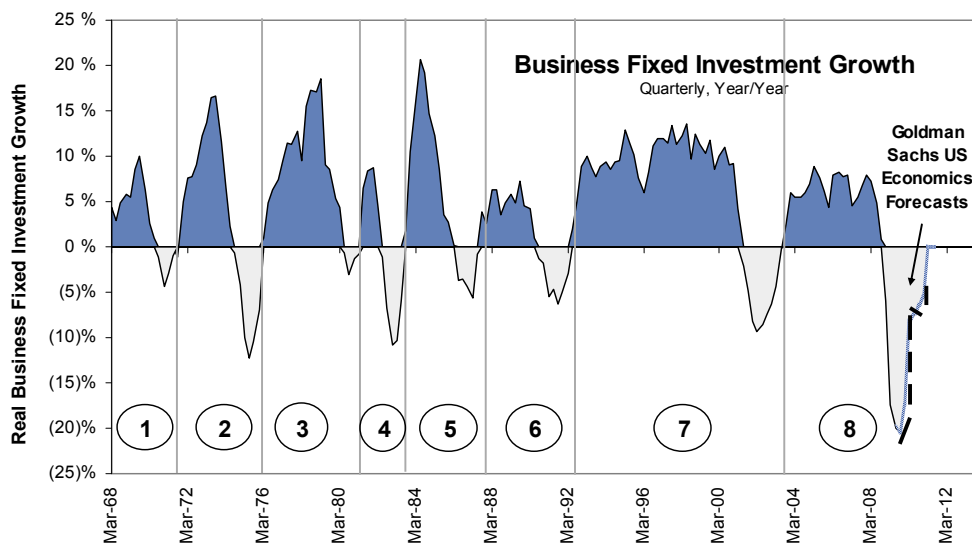
**6. Look for firms with high reinvestment ratios.** One measure of a firm's commitment to investing for future growth is the ratio of capex spending to depreciation - the reinvestment ratio. Companies with high reinvestment ratios have historically produced faster sales growth than companies with low reinvestment ratios, particularly in the periods following economic contractions. Portfolio managers are focused on top-line growth and we expect companies with high reinvestment ratios relative to their sectors will outperform the S&P 500 during the sustained rally phase of the bear market recovery.

**7. We recommend investors buy our Invest for Growth basket (Bloomberg ticker: <GSHINVG>) to gain exposure to S&P 500 firms investing in Capex and R&D.** The basket is sector neutral vs. the S&P 500 (excluding Financials and Utilities) and is comprised of 50 companies in the S&P 500 across eight sectors with the highest 1-year historical and 2-year expected reinvestment ratios. For the Health Care and Information Technology sectors, we selected firms with the highest combined Capex + R&D to depreciation ratio. The average stock in the GSHINVG basket has a reinvestment ratio of 4.8x compared with an average of 2.2x for the broader index.

# The Capex Cycle

**Capital spending has historically exhibited a distinctly cyclical pattern.** Business Fixed Investment (BFI) measures capex for all public and private companies in the U.S. Since 1967, BFI has experienced eight capital expenditure cycles, most of which featured an extended period of sustained capex growth followed by a sharp decline (see Exhibit 1). During the current cycle, the level of nominal BFI peaked in 2Q 2008 and had fallen by 19% peak-to-trough as of 2Q 2009. Goldman Sachs U.S. Economics expects the level of BFI to decline through 3Q 2010, reflecting a total decline of 25% from the peak.

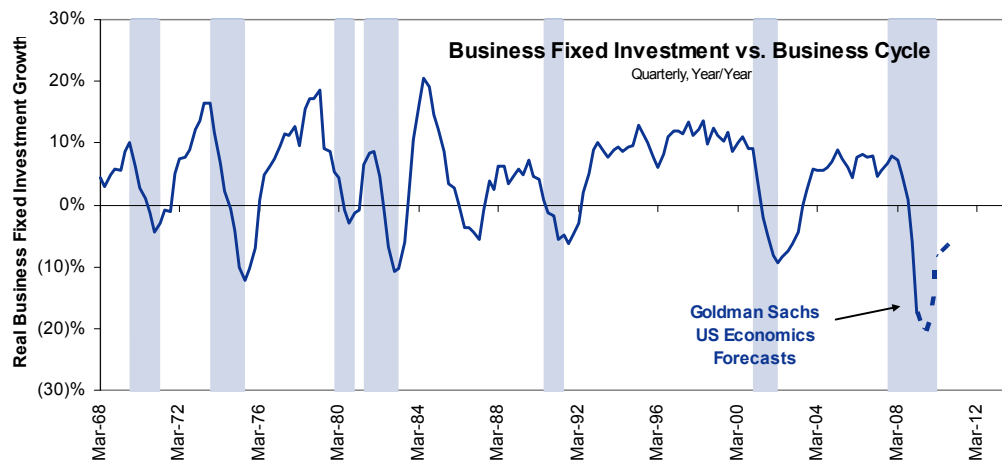
**Exhibit 1: Goldman Sachs Economics expects BFI to fall by 25%, the most in 40 years**



Source: Haver Analytics and Goldman Sachs Global ECS Research.

**Capex spending cycles roughly coincide with business cycles.** Since 1967, each capex trough has corresponded with an economic recession. While each capex cycle has been unique in duration and in magnitude, the cycles have generally reflected the length and depth of the concurrent business cycle. The current cycle, which corresponds with the most severe recession in the post-WWII period, also marks the steepest decline in business fixed investment (see Exhibit 2). BFI growth (LTM Y/Y) has traditionally peaked 1-2 quarters after GDP growth (LTM Y/Y) peaks and troughed 1-2 quarters after GDP growth troughs.

**Exhibit 2: Business Fixed Investment is highly correlated with the business cycle**



Source: Haver Analytics and Goldman Sachs Global ECS Research.

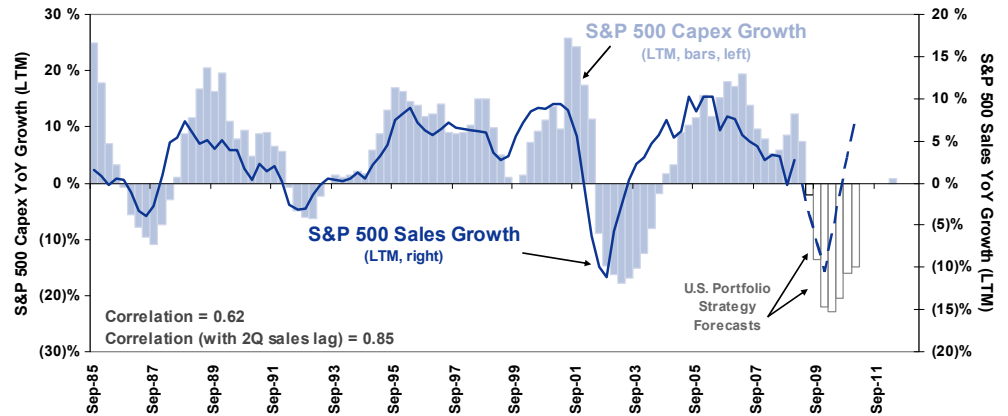
# Forecasting Capex and R&D growth for the S&P 500

## Determinants of Capex Spending

Companies' decisions regarding the quantity and timing of capital expenditures are determined by two primary factors: (1) anticipated end-market demand; and, (2) the cost of financing those capital investments.

**1. Anticipated End-Market Demand.** Our analysis of S&P 500 capex spending behavior since 1985 suggests capex is highly correlated with sales (see Exhibit 3). In general, we see capex respond to sales after a 1-2 quarter lag. We consider sales growth to be the best real-time indicator of end-market demand for most companies and believe management teams look at sales trends to make projections regarding future business prospects. This lag between sales growth and capex growth suggests that firms wait to see validation of sales trends before committing to long-term investment projects.

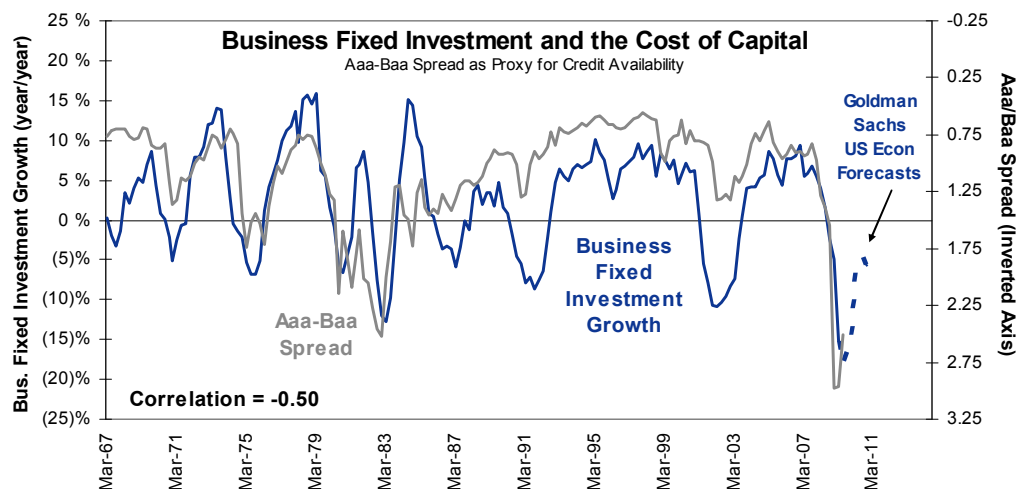
**Exhibit 3: S&P 500 capex growth is highly correlated with sales growth**



Source: Compustat and Goldman Sachs Global ECS Research.

**2. Cost of Financing.** Shifts in the availability and cost of credit also have a significant impact on capex decisions. Rising interest rates push the cost of borrowing higher, leading to declines in capex. Conversely, lower interest rates allow borrowing costs to fall, making capex projects more attractive. From a return on capital invested (ROIC) standpoint, higher borrowing costs prohibit less profitable projects from meeting firms' rate of return thresholds, forcing companies to put investments on hold until conditions improve.

**Exhibit 4: Capex growth and the cost of credit are inversely correlated**



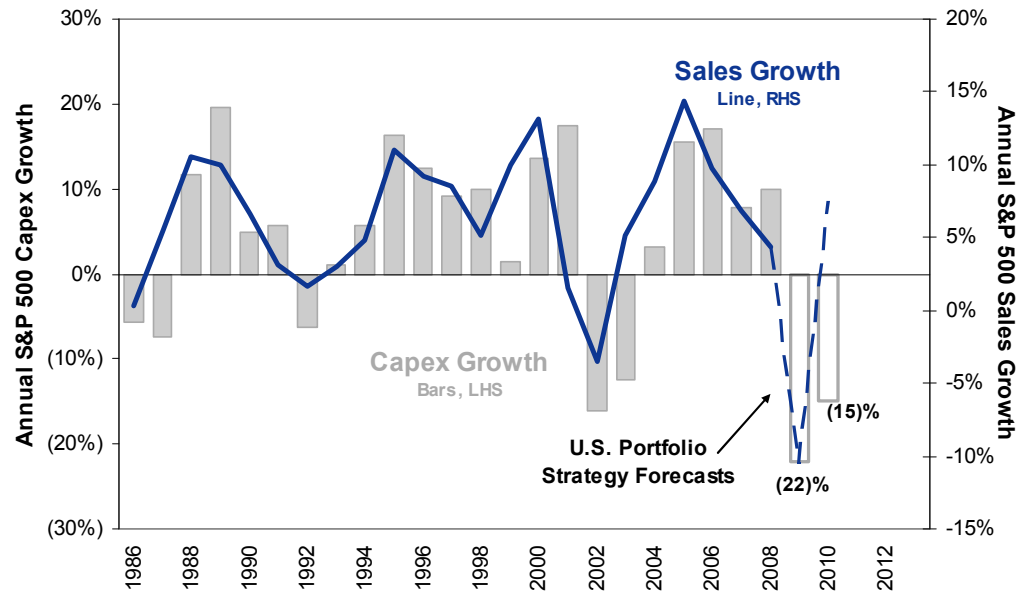
Source: Haver Analytics and Goldman Sachs Global ECS Research.

### Forecasting S&P 500 Capex

**We forecast S&P 500 capex will fall by 22% to \$442 billion in 2009 and by 15% to \$375 billion in 2010.** These forecasts represent the most significant decline in capex spending in the 25 years for which data is available. S&P 500 firms spent \$566 billion on capex in 2008, 10% above 2007 levels. We forecast capex based on its historical relationship with macroeconomic and microeconomic variables including sales, the cost of credit, US GDP, capacity utilization, and recent capex spending.

Our forecasts for 2009 and 2010 represent the steepest two-year decline for which S&P 500 capex data is available. While the magnitude of our forecast decline is unprecedented, the duration is in-line with the two-year contraction in S&P 500 capex in 2002-2003.

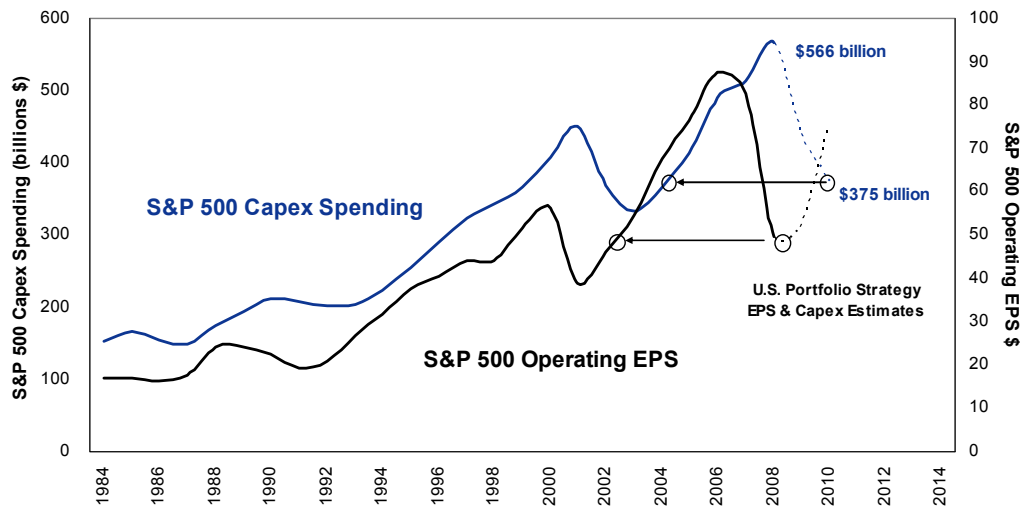
**Exhibit 5: S&P 500 (ex-Financials and Utilities) Capex growth vs. Sales growth**



Source: Compustat and Goldman Sachs Global ECS Research.

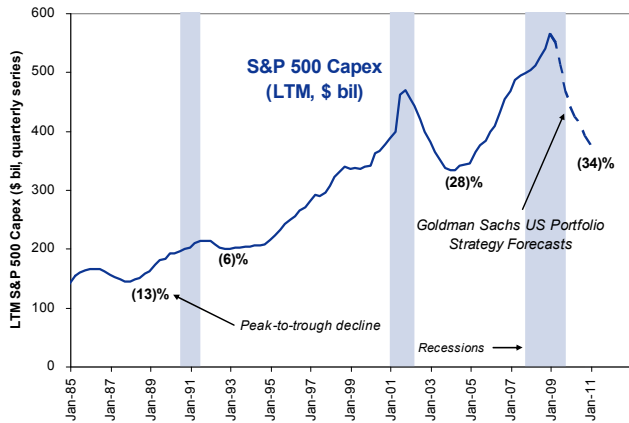
**Our forecasts imply that 2010 capex spending for the S&P 500 will return to 2004 levels.** While the speed and magnitude of our capex forecasts are dire, they are similar to what we have seen across other S&P 500 operating metrics. For instance, we saw S&P 500 operating EPS return to 2002 levels and sales fall to 2004 levels before hitting a trough.

**Exhibit 6: We expect 2010 S&P 500 capex will return to 2004 levels**



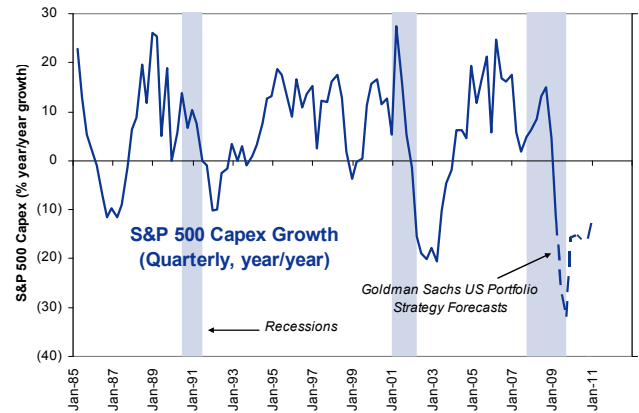
Source: Compustat and Goldman Sachs Global ECS Research.

**Exhibit 7: S&P 500 historical and projected capex**  
\$ billions, LTM series



Source: Compustat and Goldman Sachs Global ECS Research.

**Exhibit 8: S&P 500 capex growth**  
% year/year growth, quarterly



Source: Compustat and Goldman Sachs Global ECS Research.

**Our forecasts are in-line for 2009 but pessimistic for 2010.** Relative to our US Economics team’s forecasts for BFI and the bottom-up aggregation of Goldman Sachs equity analyst capex estimates, our forecasts are in-line for 2009 and pessimistic for 2010. For 2010, our forecast is only directionally in-line with the U.S. Economics view, and is significantly more pessimistic than the bottom-up forecasts (see Exhibit 9).

**Exhibit 9: US Portfolio Strategy capex growth forecasts vs. GS analysts bottom-up and US Economics BFI forecasts**

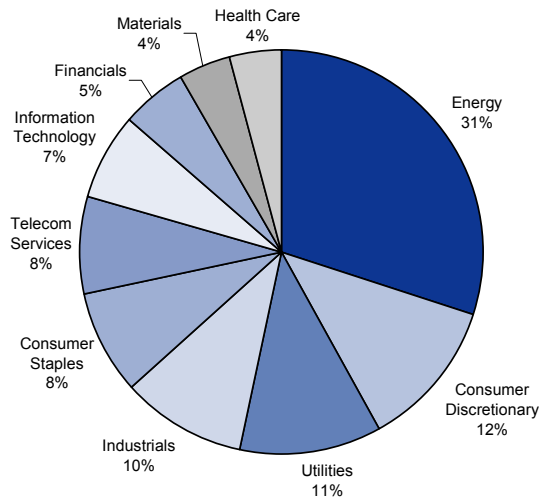
S&P 500 Capex Forecasts (% year/year growth)			
	2009E	2010E	Source
<b>US Portfolio Strategy</b>	(22)%	(15)%	Goldman Sachs US Portfolio Strategy model
<b>US Economics</b>	(18)	(6)	Goldman Sachs US Economics BFI forecast
<b>Bottom-up</b>	(18)	2	Goldman Sachs sector analyst estimates

Source: Compustat and Goldman Sachs Global ECS Research.

### Capex versus Business Fixed Investment forecasts

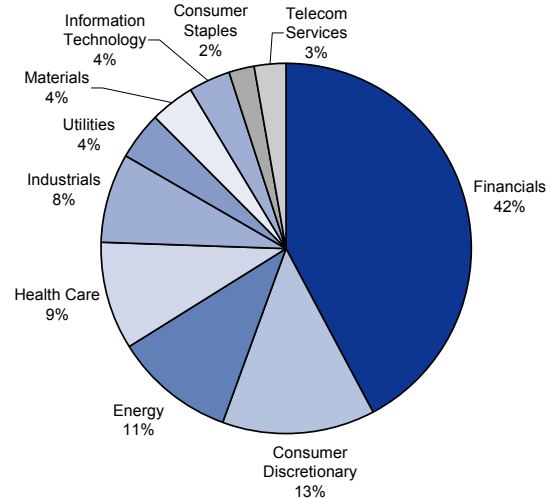
**Key differences exist between S&P 500 capex and BFI data, which partially explains the disparity between our forecasts for capex and the U.S. Economics team's BFI forecast.** These differences include sector and geographic representation, company size and the treatment of private companies. For example, the Energy sector is the largest contributor to S&P 500 capex while the Financials sector is the largest contributor to BFI (see Exhibits 10 and 11). As a large-cap index, the S&P 500 capex data only captures large, public companies, while the BFI data looks at all U.S. companies, public and private, regardless of size. Finally, the BFI data only includes domestic fixed investment spending while the S&P 500 capex data captures the domestic and international capex spending by S&P 500 firms.

**Exhibit 10: S&P 500 capex sector composition**  
as of December 31, 2008



Source: Compustat and Goldman Sachs Global ECS Research

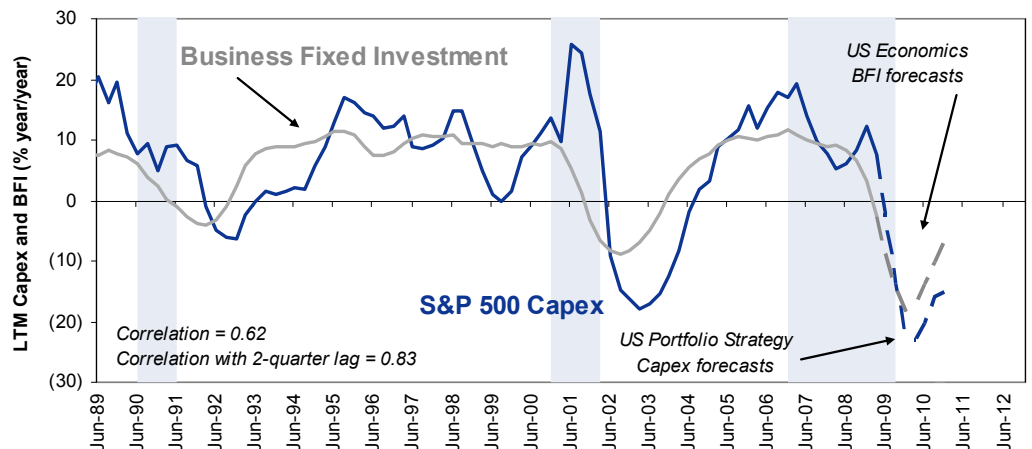
**Exhibit 11: BFI sector composition**  
as of December 31, 2007



Source: BEA and Goldman Sachs Global ECS Research

**Historically, S&P 500 capex has displayed greater cyclicity and sensitivity to economic downturns than BFI.** While the two data series measure similar metrics, the differences in composition result in diverging results. As shown in Exhibit 12, the S&P 500 has expanded and contracted to a greater degree than BFI during past economic cycles.

**Exhibit 12: S&P 500 capex is more cyclical than Business Fixed Investment**



Source: Compustat, BEA and Goldman Sachs Global ECS Research.

## Top-down versus bottom-up forecasts

**Our 2010 top-down capex forecast of -15% remains well below the expected +2% growth expectation of the bottom-up industry analysts.** Several reasons may explain the gap.

First, the historical pattern of S&P 500 aggregate capital spending suggests year/year capex growth lags year/year sales growth by roughly two quarters (correlation on a two quarter lagged basis equals 0.85). Sales growth is roughly coincident with year/year changes in GDP. We expect year/year LTM sales growth for the S&P 500 will bottom in 2Q 2010 and our colleagues in Goldman Sachs Economics forecast US GDP growth will trough on a year/year basis in 2Q 2010. Together these forecasts suggest S&P 500 capex will not trough until the second half of 2010 and will most likely not show positive year/year growth until 2011.

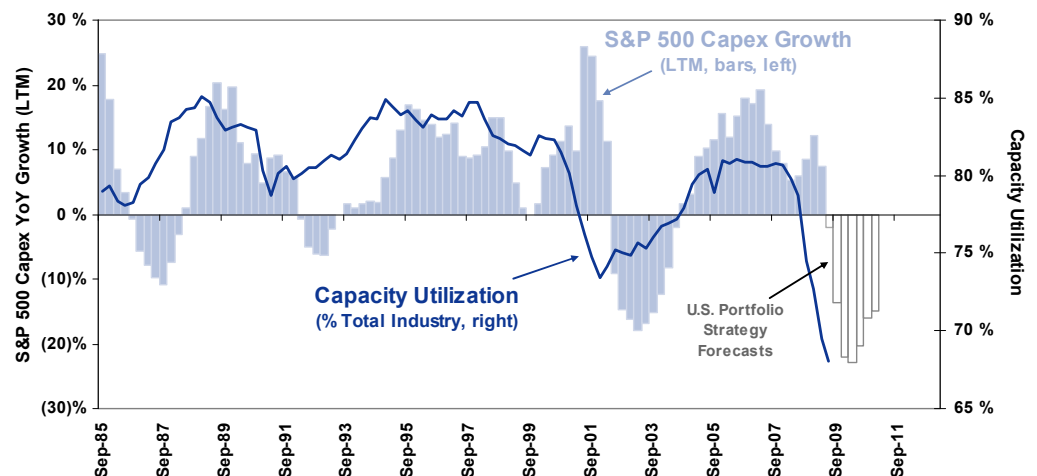
**Exhibit 13: Capex peak-to-trough declines during past cycles**

Peak to Trough Capital Expenditure Decline						
Sector	1980s Cycle	1990s Cycle	2000 Cycle	Current Cycle	Historical Decline	
					Mildest	Worst
Sector Average	(21)%	(17)%	(31)%	(15)%	(17)%	(31)%
<b>S&amp;P 500</b>	<b>(13)%</b>	<b>(6)%</b>	<b>(29)%</b>	<b>(10)%</b>	<b>(6)%</b>	<b>(29)%</b>

Source: Compustat and Goldman Sachs Global ECS Research.

Second, our top-down forecast for S&P 500 capex growth implies a 34% peak-to-trough decline which is consistent with the 2000 cycle, whereas the bottom-up forecast implies a 18% peak-to-trough decline. We expect the rebound in capex spending to be more muted than during previous cycles because capacity utilization is currently at 69%, a record low (see Exhibit 14). Capacity utilization remained weak coming out of previous downturns. We expect management teams will be reluctant to initiate new capex projects given low utilization rates and the possibility of a “double-dip” recession. (A “double-dip” recession is not our central forecast, but we acknowledge it as a non-trivial possibility.)

**Exhibit 14: Capacity Utilization rates have fallen to all-time lows**  
as of June 30, 2009



Source: Compustat, Goldman Sachs Global ECS Research

## Forecasting S&P 500 Research & Development

**We forecast S&P 500 research & development spending will fall by 9% to \$175 billion in 2009 and by 15% to \$149 billion in 2010.** Our forecasts imply that by the end of 2010, S&P 500 R&D will return to 2005 levels. Similar to capex, we model R&D on the basis of its historical relationship to key macro and micro drivers including sales, the cost of credit, US GDP, capacity utilization, and recent capex spending.

**Relative to Goldman Sachs analysts' bottom-up R&D forecasts, our top-down R&D estimates are notably pessimistic.** Bottom-up estimates imply annual growth of -4% and +5% compared with our forecasts of -9% and -15% growth in 2009 and 2010, respectively. Although R&D spending has historically been less variable than capex, we believe firms will curtail R&D and instead direct operating cash flow to pay down debt or stock-pile cash.

### Exhibit 15: US Portfolio Strategy vs. GS analysts bottom-up R&D forecasts

S&P 500 R&D Forecasts (% year/year growth)			
	2009E	2010E	Source
<b>US Portfolio Strategy</b>	(9)%	(15)%	Goldman Sachs US Portfolio Strategy model
<b>Bottom-up</b>	(4)	5	Goldman Sachs sector analyst estimates

Source: Goldman Sachs Global ECS Research.

## Methodology and risks

**Forecasting capex and R&D.** Our capex and R&D models are both aggregations of seven independent regression models, each using data through 1Q 2009 to project capex and R&D at increasingly distant points in the future. As previously mentioned, we model capex and R&D on the basis of a range of macro and micro variables including US GDP, capacity utilization, cost of credit, company sales, and recent capex trends. Although many of the same factors are statistically significant across each regression, the structure of the model allows for some variation as factors become more or less relevant over different time periods. For our capex model, the  $R^2$  of our quarterly forecasts for 2009 are relatively high, ranging between 0.75 and 0.78, while the  $R^2$  for our 2010 quarterly forecasts fall considerably to between 0.41 and 0.68. For our R&D model, the  $R^2$  of our forecasts for 2009 are lower, ranging between 0.27 and 0.17, while the  $R^2$  for our 2010 forecasts fall to between 0.11 and 0.14. The lower  $R^2$  for the R&D model is reflective of the historical lack of variability in R&D spending relative to the micro and macro regressors.

**Risks to the upside exist for our 2010 capex and R&D forecasts.** Given the magnitude of the current recession, many of the macro and micro variables in our model have declined more in the current cycle than any point in the 25 years of data used to construct the model. We believe capex growth could end up somewhere between our forecasted -15% decline and the -6% growth predicted by the US Global ECS Research team, while R&D growth could be slightly less negative than our forecasts suggest.

## S&P 500 corporate investment at the sector level

### S&P 500 Capital Expenditures

**S&P 500 firms spent an aggregate of \$566 billion on capex in 2008, 10% above 2007.**

Sector growth rates for last year varied significantly. Energy capex grew by 38% in 2008 while Financials capex declined by 10%. We also saw Consumer Discretionary capex decline for the second consecutive year, falling by 9% in 2008 after a 15% decline in 2007. The sector share of S&P 500 capex has remained relatively stable since 2006, with the exception of Energy, which continues to take share mostly at the expense of Financials and Consumer Discretionary (see Exhibit 16).

**The Energy sector accounted for close to one-third of total 2008 S&P 500 capex.**

Energy companies continue to account for the greatest share of S&P 500 capex despite accounting for only 12% of S&P 500 equity market capitalization.

**In 1Q 2009, S&P 500 aggregate capex declined 15% year/year, with every sector except for Utilities cutting capex spending.** Six sectors cut capex by more than 20% year/year, led by Telecom Services and Consumer Discretionary, which slashed capex spending by 27% and 25%, respectively. Energy firms, which only cut capex by 3% year/year, experienced the mildest decline.

**Exhibit 16: S&P 500 Capex level, year/year growth and contribution by sector**

	\$ Billions				Growth (% YoY)				Sector Share (%)			
	FY 2006	FY 2007	FY 2008	Q1 2009	FY 2006	FY 2007	FY 2008	Q1 2009	FY 2006	FY 2007	FY 2008	Q1 2009
Telecommunication Services	\$40	\$45	\$44	\$8	22 %	12 %	(2)%	(27)%	8 %	9 %	8 %	7 %
Consumer Discretionary	85	72	66	12	11	(15)	(9)	(25)	17	14	12	11
Information Technology	38	40	40	7	26	4	1	(24)	8	8	7	6
Financials	30	34	30	6	4	11	(10)	(23)	6	7	5	5
Industrials	54	56	58	10	8	4	2	(21)	11	11	10	9
Materials	19	21	24	4	16	13	12	(21)	4	4	4	4
Consumer Staples	44	47	45	10	13	6	(5)	(18)	9	9	8	9
Health Care	21	22	23	4	(7)	9	3	(17)	4	4	4	4
Energy	111	123	170	34	49	11	38	(3)	23	24	30	30
Utilities	49	55	67	16	27	11	22	1	10	11	12	14
<b>S&amp;P 500</b>	<b>\$492</b>	<b>\$515</b>	<b>\$566</b>	<b>\$111</b>	<b>20 %</b>	<b>5 %</b>	<b>10 %</b>	<b>(15)%</b>	<b>100 %</b>	<b>100 %</b>	<b>100 %</b>	<b>100 %</b>

Source: Compustat and Goldman Sachs Global ECS Research

**Bottom-up forecasts for S&P 500 capex suggest that the Materials, Industrials, and Energy sectors will experience the most severe declines in capex spending this cycle.**

Nine of ten sectors are forecasted to experience capex declines in 2009 and three of ten sectors are expected to experience declines in capex in 2010. As previously discussed, Goldman Sachs bottom-up consensus forecasts imply an 18% peak-to-trough decline for S&P 500 capex this cycle as compared to our top-down forecast for a 34% peak-to-trough decline. The Industrials, Consumer Discretionary, Financials, and Consumer Staples sectors are expected to experience declines in-line with the worst historical declines in capex spending.

**Exhibit 17: Historical peak-to-trough declines in capex by sector**

Sector	Peak to Trough Capital Expenditure Decline						Bottom-up Estimates (a)	
	1980s	1990s	2000	Current	Historical Declines		2009	2010
	Cycle	Cycle	Cycle	Cycle	Mildest	Worst		
Telecom Services	(12)%	(3)%	(65)%	(14)%	(3)%	(65)%	(10)%	1 %
Materials	(15)	(31)	(56)	(14)	(15)	(56)	(30)	(2)
Information Technology	(27)	(16)	(55)	(18)	(16)	(55)	(17)	14
Energy	(51)	(16)	(15)	(6)	(15)	(51)	(24)	2
Utilities	(50)	(39)	(43)	(2)	(39)	(50)	(4)	(0)
Industrials	(5)	(20)	(30)	(9)	(5)	(30)	(27)	(8)
Consumer Discretionary	(14)	(9)	(27)	(34)	(9)	(27)	(23)	1
Financials	(23)	(19)	(11)	(30)	(11)	(23)	(22)	1
Health Care	(6)	(15)	(4)	(10)	(4)	(15)	1	9
Consumer Staples	(5)	(6)	(3)	(12)	(3)	(6)	(7)	4
Sector Average	(21)%	(17)%	(31)%	(15)%	(17)%	(31)%	(16)%	2 %
<b>S&amp;P 500</b>	<b>(13)%</b>	<b>(6)%</b>	<b>(29)%</b>	<b>(10)%</b>	<b>(6)%</b>	<b>(29)%</b>	<b>(18)</b>	<b>2</b>

Note: Boxes represent worst historical peak-to-trough decline for each sector

(a) Goldman Sachs bottom-up forecasts. Source: Compustat, Goldman Sachs Global ECS Research.

## S&P 500 Research & Developments

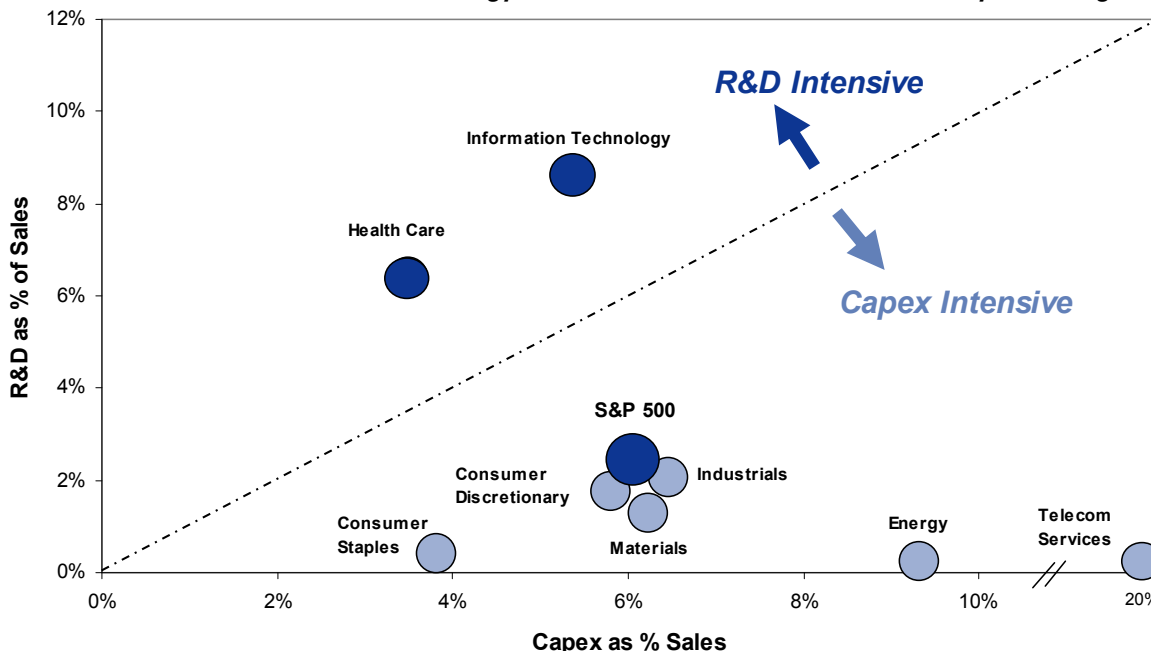
**Research & Development is the second critical component of corporate investment. In addition to the \$566 billion S&P 500 firms spent on capex, they spent another \$192 billion on R&D in 2008.** These investments typically go towards the development of new technologies, medicines and treatments, and product designs. In the same way that a new manufacturing plant is critical for the future growth of an Industrial or Materials company, investments in R&D are crucial to sustaining long-term operational success for Health Care and Information Technology firms.

**The Health Care and Information Technology sectors invest heavily in R&D but have historically made modest capex investments.** Information Technology is the most R&D intensive sector, spending an average of 9% of sales on R&D over the past 10 years. By comparison, Information Technology firms spent only 5% of sales on capex over the past 10 years. Healthcare is the second most R&D intensive sector, investing an average of 6% of sales in R&D over the past 10 years, but is the least capex intensive sector.

**At the Information Technology sub-sector level, the Application Software, Systems Software, Computer Storage and Peripherals, Communications Equipment and Semiconductor Equipment sub-sectors all invest more than 10% of sales in R&D.** Most notably, both the Applications Software sub-sector, which includes companies such as Autodesk (ADSK) and Adobe Systems (ADBE), and the System Software sub-sector, which includes companies such as McAfee (MFE), Microsoft (MSFT), Oracle (ORCL) and Symantec (SYMC), commit at least 15% of revenues to R&D.

**Within the Healthcare sector, the Biotechnology, Pharmaceuticals, and Health Care Equipment sub-sectors all invest more than 10% of their sales in R&D each year.** Over the past 10 years, the Biotechnology industry in particular has reinvested an average of 32% of revenues in R&D. For 2009, Goldman Sachs analysts expect Amgen (AMGN), Celgene (CELG), Gilead Sciences (GILD) and Genzyme (GENZ) to reinvest 18%, 26%, 14% and 17% of sales in R&D.

**Exhibit 18: Health Care and Information Technology are the most R&D intensive sectors (10-year averages)**



Source: Compustat and Goldman Sachs Global ECS Research.

**At the sector level, bottom-up estimates suggest that R&D spending in the Consumer Discretionary and Consumer Staples sectors will rebound from double-digit declines in 2009 and grow in 2010.** Interestingly, there is not much correlation between sectors projected to make significant capex spending recoveries and sectors projected to make significant R&D spending recoveries (see Exhibits 19 and 20).

**Exhibit 19: Composition of investments for growth**

Sector	Investing for Growth: Importance of R&D		R&D as % of Total Investment
	2008 Spending (\$ Bil) Capex	2008 Spending (\$ Bil) R&D	
Health Care	23	63	73%
Information Technology	40	71	64
Industrials	58	23	28
<b>S&amp;P 500</b>	<b>566</b>	<b>192</b>	<b>25</b>
Consumer Discretionary	67	20	23
Materials	24	6	20
Consumer Staples	46	5	10
Energy	171	4	2
Telecom Services	44	1	2
Utilities	65	0	0
Financials	30	0	0

Source: Compustat and Goldman Sachs Global ECS Research.

**Exhibit 20: GS Bottom-up Sector R&D Forecasts**

Sector	Bottom-up R&D Growth Estimates by Sector	
	2009	2010
Consumer Discretionary	(19)%	16 %
Health Care	0	13
<b>S&amp;P 500</b>	<b>(4)</b>	<b>5</b>
Consumer Staples	(48)	4
Telecom Services	6	3
Information Technology	(6)	3
Materials	25	2
Energy	(9)	(1)
Industrials	(8)	(5)
Financials	16	(8)
Utilities	NM	NM

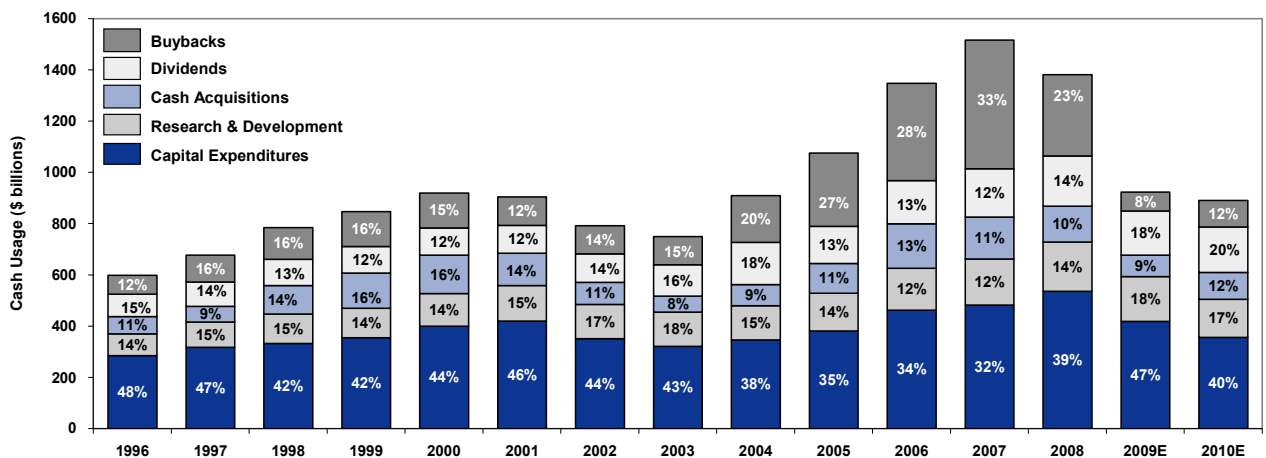
Source: Compustat and Goldman Sachs Global ECS Research.

## Turning Cash into Value: Capex and R&D

**Capex has historically comprised the greatest percentage of total S&P 500 capital usage.** Over the past 13 years, S&P 500 companies have allocated between 32% and 48% of all capital usage to capex spending. Only in 2007, when firms allocated 33% of cash usage to share repurchases, was capex subordinated by another use of capital. Based on our capex and R&D forecasts for 2009 and 2010, we expect S&P 500 companies to allocate 65% in 2009 and 57% in 2010 of capital usage to invest for growth via capex and R&D.

**Firms that continue to invest in their businesses while competitors retrench will have an opportunity to strengthen their competitive positioning.** Given the extraordinarily challenging environment of the past 18 months, company management teams are expected to focus on strengthening their balance sheets, paying down debt, and stockpiling cash. Companies that continue to invest in their businesses can streamline manufacturing processes, get ahead in the development of new products, and gain market share. In our view, these firms will be better positioned to become or remain industry leaders over the long-run.

**Exhibit 21: Cash Usage by S&P 500 companies (ex-Financials)**



Use of cash:	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009E	2010E
<b>Invest for Growth</b> (Capex + R&D + M&A)	73%	70%	71%	72%	74%	76%	72%	69%	62%	60%	59%	54%	63%	73%	68%
<b>Return to Investors</b> (buybacks + dividends)	27%	30%	29%	28%	26%	24%	28%	31%	38%	40%	41%	46%	37%	27%	32%

Source: Compustat, Goldman Sachs Global ECS Research

**We expect total capital usage to decline by 34% in 2009 and fall by another 4% in 2010, (see Exhibit 22). Our detailed projections are described below.**

- Capital Expenditures (40% of total in 2010).** We estimate that capex will decline by 22% in 2009 to \$442 billion and by another 15% in 2010 to \$375 billion. We expect capital expenditures will become an increasingly large portion of cash spending, rising to 40% in 2010 up from a low of 32% in 2007. We model capex based on its historical relationship with macroeconomic variables including US GDP, the cost of credit, and capacity utilization, as well as micro variables such as sales and recent capex spending.
- Research & Development (17% of total in 2010).** We estimate that R&D will decline by 9% in 2009 to \$175 billion and by another 15% in 2010 to \$149 billion. We expect R&D will also become an increasingly large portion of cash spending, rising to 17% in 2010 up from a low of 12% in 2007. Similar to capex, we model R&D based on its historical relationship with macro and micro variables.

**Exhibit 22: Capital usage summary, 2006-2010 (\$ billions)**

	2006	2007	2008	2009E	2010E
<b>Capital Usage</b>					
Capital Expenditures	\$490	\$515	\$566	\$442	\$375
Research & Development	164	179	192	175	149
Cash Acquisitions	197	217	153	92	115
Share Buybacks	481	626	346	80	113
Dividends	237	270	265	209	203
<b>Total Capital Usage</b>	<b>\$1,569</b>	<b>\$1,807</b>	<b>\$1,522</b>	<b>\$998</b>	<b>\$954</b>
<b>% year/year growth</b>					
<b>Capital Usage</b>					
Capital Expenditures	18 %	5 %	10 %	(22)%	(15)%
Research & Development	11	10	7	(9)	(15)
Cash Acquisitions	44	10	(29)	(40)	25
Share Buybacks	33	30	(45)	(77)	40
Dividends	15	14	(2)	(21)	(3)
<b>Total Capital Usage</b>	<b>24 %</b>	<b>15 %</b>	<b>(16)%</b>	<b>(34)%</b>	<b>(4)%</b>

Note: Capital usage data for all 10 S&P 500 sectors.

Source: Compustat and Goldman Sachs Global ECS Research.

- **Cash M&A (12% of total in 2010).** Cash M&A is expected to increase by 25% in 2010 following a 40% decline in 2009. This reflects a 57% peak-to-trough decline from the 2007 peak of \$217 billion. Our forecasts for cash M&A are in line with our bank analysts' estimates for US M&A volume growth.
- **Dividends (20% of total in 2010).** We expect S&P 500 dividends per share will fall by 21% in 2009, the largest year/year decline since the 38% decline in 1938 and the 39% fall in 1932. This reflects the impact of cuts in 2009 as well as the impact of some intra-year cuts from 2008. We expect S&P 500 dividends will decline by 3% in 2010. Our estimates are based on our top-down earnings growth model and projections for future dividend payout levels adjusting for announced special dividend payments. The current 2009 dividend yield for the equal-weighted S&P 500 equals 2.3% based on a payout ratio of 41%.
- **Share Repurchases (12% of total in 2010).** As dividends tend to be a stickier form of returning cash to shareholders, we expect a more dramatic year over year decline in buyback activity. Share repurchases fell by 45% in 2008, and we expect a further decline of 77% in 2009 (buybacks plunged during the first half of 2009) followed by a 40% rebound in 2010. We also expect buybacks as a percentage of total capital usage to decline from a peak of 33% in 2007 to just 8% in 2009. Our 2009 full year forecasts are derived from share buyback activity year-to-date and our 2010 forecast is based on buyback activity following previous economic slowdowns.

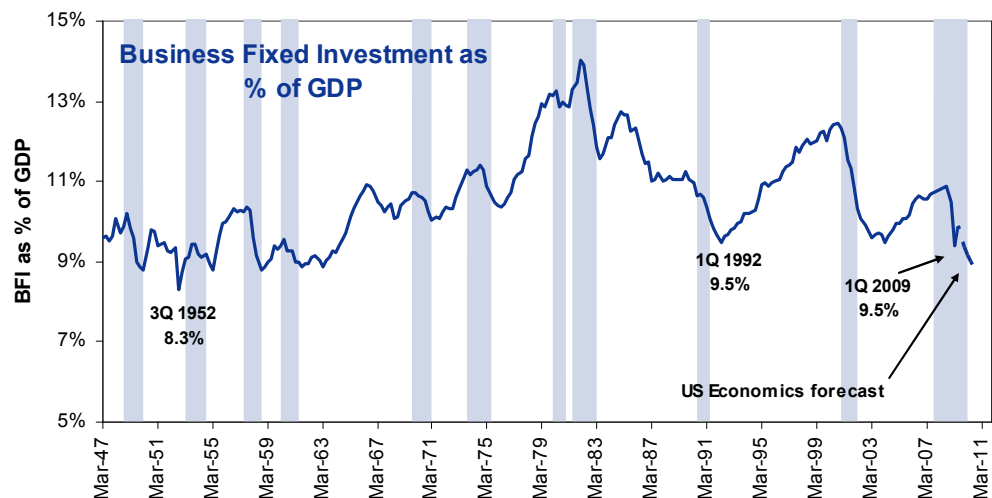
## Buy Companies that Invest in Capex and R&D <GSTHINVG>

**We favor companies that invest for growth through capex and R&D relative to the broader market.** Corporate capital usage in the form of capex, R&D, dividends, share repurchases and cash M&A will be depressed in 2009 and 2010. We expect companies that demonstrate a continued commitment to investing in capex and R&D to be rewarded by investors.

**The current recession is projected to push BFI as a percent of GDP to all time lows.**

Since 1947, BFI as a percent of GDP has oscillated between a low of 8.3% in 3Q 1952 and a high of 14% in 1Q 1982. In 1Q 2009, BFI comprised just 9.5% of GDP, representing a 27-year low. U.S. Economics forecasts imply that capex as a percent of GDP will fall further to 8.3% in 4Q 2010, which would represent the lowest level of investment in the 62 years for which data is available. This emphasizes the fact that capex will be hard to come by in 2009 and 2010, and highlights the opportunity for firms that continue to invest to differentiate themselves from their competitors.

**Exhibit 23: Business Fixed Investment as a % of GDP**

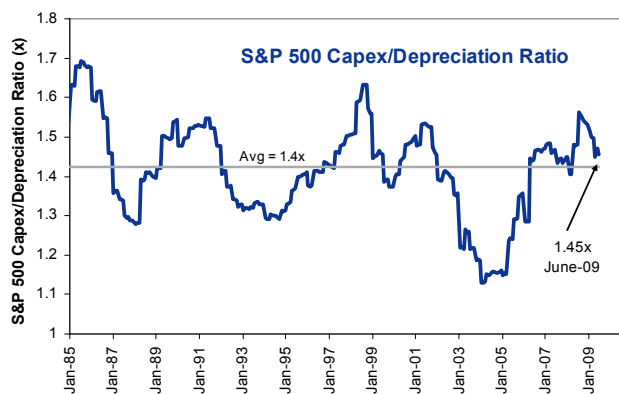


Source: Haver and Goldman Sachs Global ECS Research.

**Look for firms with high reinvestment ratios.** One measure of a company's commitment to investing for future growth is the ratio of capex spending to depreciation, often described as a reinvestment ratio. A company with a reinvestment ratio above 1.0x is investing above and beyond the amount needed to maintain its current capital base. Over the past 20 years, the reinvestment ratio for the S&P 500 has averaged 1.4x and fell as low as 1.1x in late 2003. At the end of 1Q 2009 the S&P 500 reinvestment ratio was slightly above average at 1.45x (see Exhibit 24).

**Utilities and Energy companies have the highest capex/depreciation ratios.** At the sector level, the Utilities and Energy companies have historically had the highest reinvestment ratios within the S&P 500, averaging 2.1x and 1.8x from 1999-2008, respectively (see Exhibit 25).

**Exhibit 24: S&P 500 capex/depreciation over time**



Source: Compustat and Goldman Sachs Global ECS Research.

**Exhibit 25: S&P 500 capex/depreciation by sector**

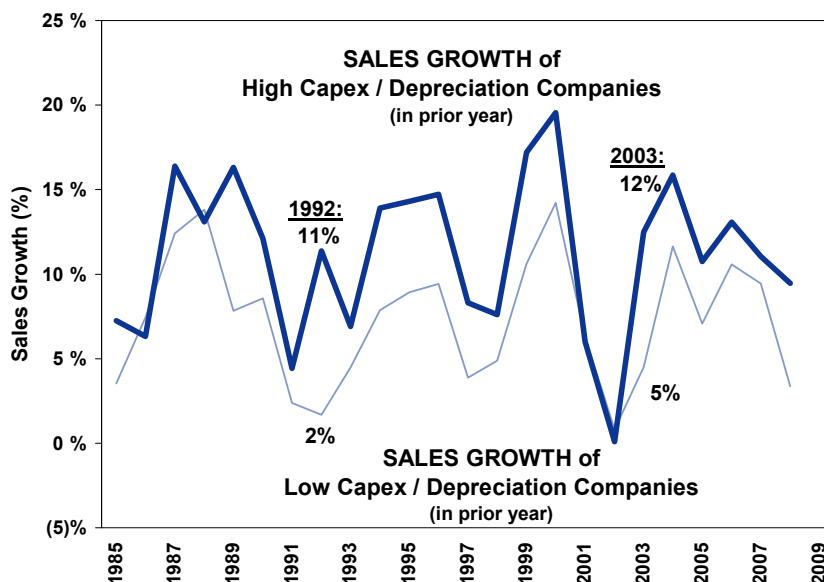
Capex / Depreciation Ratios by Sector						Average 1998-08
	2004	2005	2006	2007	2008	
Utilities	1.4	1.5	1.8	2.0	2.5	2.1
Energy	1.5	1.9	2.3	2.0	2.4	1.8
Consumer Staples	1.5	1.6	1.6	2.1	1.6	1.6
Industrials	1.5	1.5	1.9	1.5	1.5	1.5
Consumer Discretionary	1.2	1.6	1.3	1.2	1.0	1.4
Health Care	1.2	1.0	0.9	1.0	1.0	1.3
Telecom Services	0.8	1.0	0.9	0.9	1.0	1.1
Materials	0.8	1.0	1.3	1.4	1.6	1.1
Information Technology	0.8	0.9	1.1	1.2	1.0	1.0
<b>S&amp;P 500</b>	<b>1.2</b>	<b>1.4</b>	<b>1.5</b>	<b>1.4</b>	<b>1.5</b>	<b>1.4</b>

Source: Compustat and Goldman Sachs Global ECS Research.

**Companies with high reinvestment ratios have historically produced higher sales growth than companies with low reinvestment ratios.** On a sector neutral basis, we analyzed the sales growth of high reinvestment ratio companies versus low reinvestment ratio companies over time. We found that firms reinvesting in their businesses delivered stronger sales growth over time, particularly during the periods following economic contractions. In 1992 and 2003, for example, the differential between the sales growth of companies with high and low capex/depreciation ratios was 10pp and 8pp, respectively.

**Exhibit 26: Sales growth differential between high capex/depreciation and low capex/depreciation companies**

Sales Growth			
	LOW Capex / Depreciation	HIGH Capex / Depreciation	Growth Differential
1985	4 %	7 %	4 pp
1986	7	6	(1)
1987	12	16	4
1988	14	13	(1)
1989	8	16	8
1990	9	12	4
1991	2	4	2
<b>1992</b>	<b>2</b>	<b>11</b>	<b>10</b>
1993	4	7	2
1994	8	14	6
1995	9	14	5
1996	9	15	5
1997	4	8	4
1998	5	8	3
1999	11	17	7
2000	14	20	5
2001	6	6	(0)
2002	1	0	(1)
<b>2003</b>	<b>5</b>	<b>12</b>	<b>8</b>
2004	12	16	4
2005	7	11	4
2006	11	13	3
2007	9	11	2
2008	3	9	6
<b>Average</b>	<b>7 %</b>	<b>11 %</b>	<b>4 pp</b>

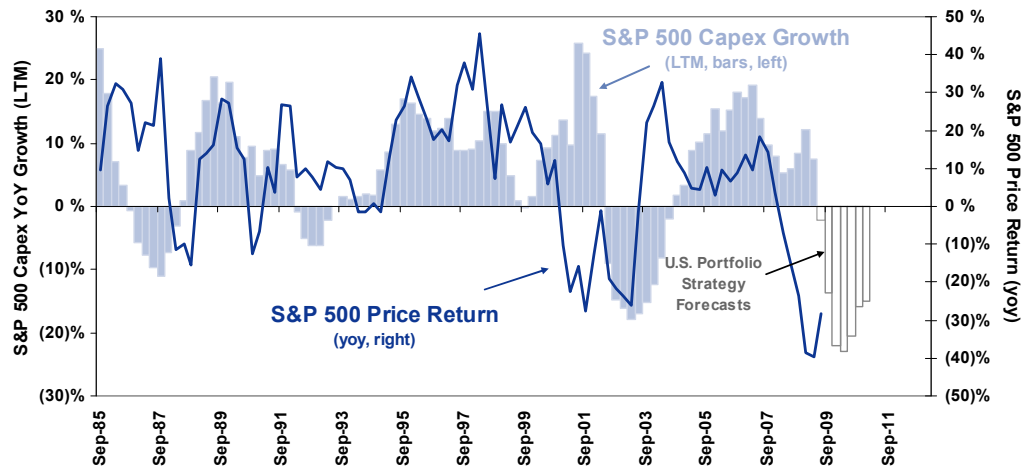


Source: Compustat, Goldman Sachs Global ECS Research

**We expect companies with high reinvestment ratios relative to their sectors to outperform the S&P 500 during the sustained rally phase of the bear market recovery.**

The recovery in capex has historically lagged equity market recoveries, suggesting that many firms continue to cut capex spending during the initial stages of the equity market rally. Our forecasts imply that many firms will continue to cut capex well into 2010, regardless of the performance of the equity market. Companies that grow or maintain capex spending during 2H 2009 and 2010 will differentiate themselves from their competitors and should, in our view, be rewarded by investors.

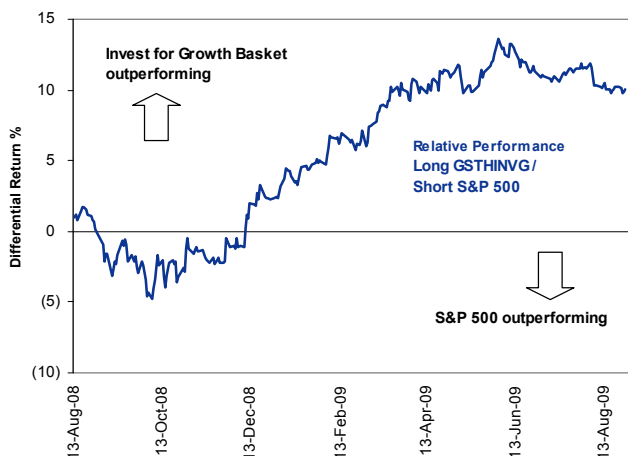
**Exhibit 27: S&P 500 price return versus capex growth; as of March 31, 2009**



Source: Factset, Compustat and Goldman Sachs Global ECS Research.

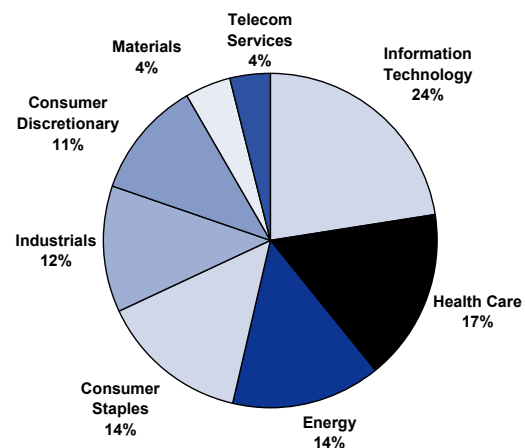
**We recommend investors buy our Invest for Growth basket (Bloomberg ticker: <GSTHINVG>) to gain exposure to S&P 500 firms investing in Capex and R&D.** The basket is sector neutral to the S&P 500 (excluding Financials and Utilities) and is comprised of 50 companies in the S&P 500 across eight sectors with the highest 1-year historical and 2-year expected reinvestment ratios (capex/depreciation). For Health Care and Information Technology, we selected firms with the highest combined Capex + R&D to depreciation ratio. The average stock in the GSTHINVG basket has a reinvestment ratio of 4.8x compared with an average of 2.2x for the broader index.

**Exhibit 28: GSTHINVG performance relative to S&P 500 as of August 27, 2009**



Source: Factset and Goldman Sachs Global ECS Research.

**Exhibit 29: Sector composition of GSTHINVG as of August 27, 2009**



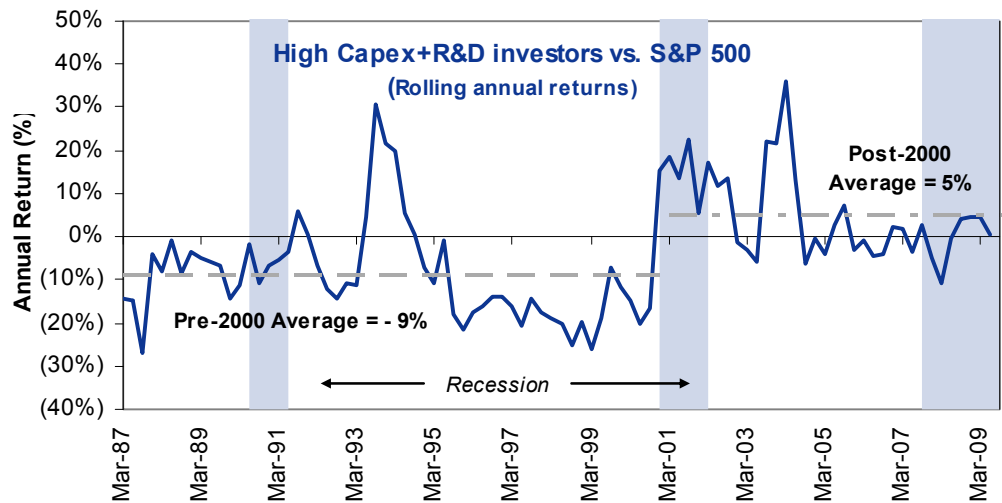
Source: Factset and Goldman Sachs Global ECS Research.

**We analyzed the historical performance of high Capex and R&D spenders versus the S&P 500 to assess the validity of our Invest for Growth strategy.** Our back-test sorted S&P 500 firms (ex-Financials and Utilities) by the ratio of capex/depreciation (we included R&D for Health Care and Info Tech) and compared the performance of the top 50 stocks on a sector-neutral basis to the performance of the market. We rebalanced the long side of the basket and the S&P 500 constituents annually with basket turnover of approximately 20%.

The back-test strategy, which is slightly different from our basket construction in that it is based solely on the LTM reinvestment ratio, generated 5% annual excess returns in the period since 2000 but lost 9% annually from 1987-2000. The median reinvestment ratio for the long side of the back-test strategy is 2-3x the median ratio for the broader index.

**Exhibit 30: Performance of High Capex + R&D/ Depreciation stocks vs. S&P 500**

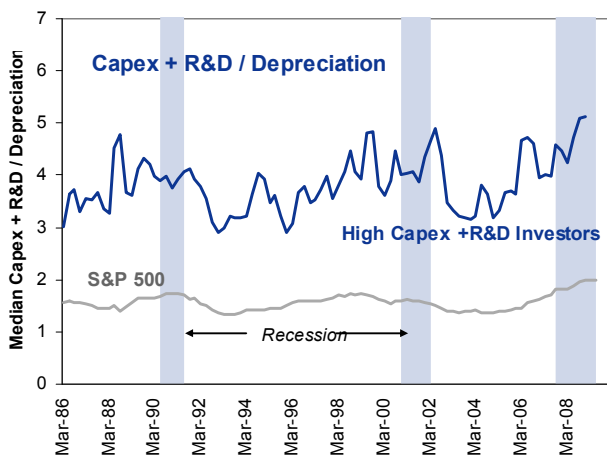
Strategy assumes annual rebalancing of long basket based on LTM (capex+R&D)/depreciation



Source: Compustat and Goldman Sachs Global ECS Research.

**At the sector level, the strategy works best for the Energy and Materials sectors, two of the most capex-intensive sectors in the S&P 500.** The Energy and Materials holdings would have outperformed Energy and Materials sectors by 11% and 10%, respectively.

**Exhibit 31: Capex + R&D/ Depreciation for high investing companies vs. S&P 500; Median of top 50 Capex and R&D spenders by sector**



Source: Compustat and Goldman Sachs Global ECS Research.

**Exhibit 32: Sector specific performance of High Capex + R&D / Depreciation vs. S&P 500; annual rebalancing of long basket based on LTM (capex+R&D)/depreciation**

Average Annual Trading Strategy Returns			
	Pre-2000	Post-2000	1986-present
Energy	(5.5)%	11 %	1 %
Materials	(14)	10	(5)
<b>S&amp;P 500</b>	<b>(9)</b>	<b>5</b>	<b>(4)</b>
Consumer Staples	(11)	3	(6)
Consumer Discretionary	(13)	2	(7)
Industrials	(16)	1	(10)
Health Care	(9)	(1)	(6)
Technology	(14)	(1)	(8)

Source: Compustat and Goldman Sachs Global ECS Research.

**Constituents of the Invest for Growth basket (Bloomberg ticker <GSTHIVG>)**

as of August 27, 2009

Company	Ticker	Rating	Avg. Capex / Depreciation (a)				Capex Growth (year/year)				Avg. Growth '09-10 (%)		
			2008	2009E	2010E	2008-2010E	2008A	2009E	2010E	CAGR	Sales	Earnings	NTM P/E
<b>Consumer Discretionary</b>													
Carnival Corp.	CCL	Sell	2.7	2.6	2.2	2.6	1 %	1 %	(5)%	(1)%	7 %	3 %	15.9
McDonald's Corp.	MCD	Buy	1.8	1.8	1.8	1.8	10	0	3	4	5	10	14.0
Kohl's Corp.	KSS	Buy	2.0	1.5	1.5	1.5	(32)	(19)	7	(16)	4	11	18.3
Yum! Brands, Inc	YUM	Buy	1.7	1.6	1.4	1.6	26	(4)	(6)	5	3	11	15.9
Darden Restaurants	DRI	Neutral	1.9	1.6	1.4	1.6	38	(10)	(9)	4	3	7	12.0
NIKE Inc.	NKE	Neutral	3.0	1.3	1.4	1.4	30	(3)	8	11	2	3	16.3
<b>Consumer Staples</b>													
Avon Products	AVP	Sell	2.0	2.4	2.6	2.4	37 %	(13)%	10 %	9 %	7 %	28 %	16.4
Colgate-Palmolive	CL	Neutral	2.0	2.0	2.0	2.0	17	(0)	8	8	6	11	16.2
Costco Co.	COST	Neutral	2.3	1.8	1.7	1.8	3	(16)	0	(5)	7	9	19.6
Coca-Cola Co.	KO	Buy	1.6	2.2	1.8	1.8	19	(3)	(17)	(2)	6	10	15.8
Walgreen Co.	WAG	Neutral	2.7	1.8	1.4	1.8	15	(14)	(12)	(4)	6	14	15.4
Wal-Mart Stores	WMT	Neutral	1.8	1.7	1.6	1.7	(21)	5	6	(4)	6	9	13.8
Dr. Pepper Snapple Group	DPS	Buy	1.5	1.7	1.7	1.7	32	(10)	3	7	2	7	13.1
<b>Energy</b>													
Enso International Inc.	ESV	Buy	3.5	3.8	2.3	3.5	49 %	3 %	(30)%	2 %	(9)%	(26)%	8.7
Rowan Cos.	RDC	Neutral	5.9	3.3	1.7	3.3	79	(32)	(43)	(12)	(10)	(38)	9.1
Southwestern Energy	SWN	Neutral	4.2	3.4	2.7	3.4	16	(7)	6	5	37	37	23.0
Chesapeake Energy Corp.	CHK	Buy	8.2	2.9	2.2	2.9	81	(72)	(10)	(24)	11	(7)	10.2
Consol Energy Inc.	CNX	Neutral	2.7	2.3	1.7	2.3	43	(6)	(20)	2	7	(1)	11.7
Spectra Energy Corp.	SE	Neutral	2.6	1.8	2.3	2.3	69	(50)	37	5	5	27	14.7
Diamond Offshore Drilling	DO	Neutral	2.3	2.6	1.0	2.3	3	40	(57)	(15)	(0)	(5)	9.5
<b>Health Care (a)</b>													
Forest Laboratories	FRX	Sell	10.9	12.6	12.6	12.6	27 %	28 %	1 %	18 %	6 %	7 %	8.2
Celgene Corp.	CELG	Sell	18.5	11.4	9.9	11.4	20	17	22	19	20	30	22.5
Genzyme Corp.	GENZ	Sell	5.1	9.7	10.9	9.7	71	(13)	14	19	21	56	19.4
Cephalon Inc	CEPH	Buy	2.8	7.7	8.0	7.7	(22)	19	16	3	9	11	9.3
Gilead Sciences	GILD	Neutral	8.3	8.2	8.1	8.2	46	108	(50)	15	15	12	16.7
Eli Lilly & Co.	LLY	Sell	8.6	6.2	6.6	6.6	(12)	27	0	3	6	6	8.2
Schering-Plough	SGP	Not Rated	2.0	6.2	6.1	6.1	21	17	37	25	6	11	16.0
Bristol-Myers Squibb	BMJ	Neutral	5.6	8.4	6.1	6.1	12	1	5	6	7	8	11.2
<b>Industrials</b>													
General Electric	GE	Buy	1.4	2.2	1.6	1.6	1 %	(18)%	(17)%	(12)%	(3)%	(12)%	17.2
Quanta Services Inc.	PWR	Buy	1.6	1.7	1.4	1.6	33	3	0	11	14	53	29.4
Deere & Co.	DE	Neutral	1.9	1.5	1.5	1.5	(44)	0	(3)	(18)	(0)	12	24.9
Precision Castparts	PCP	Neutral	1.6	1.4	1.3	1.4	(6)	(9)	(9)	(8)	(3)	1	12.9
Grainger (W.W.) Inc.	GWV	Buy	1.3	1.3	1.9	1.3	(4)	(22)	34	0	4	8	17.2
Lockheed Martin Corp.	LMT	Neutral	1.1	1.3	1.4	1.3	(1)	3	3	1	6	12	9.8
Fluor Corp.	FLR	Neutral	1.1	1.3	1.4	1.3	(12)	(12)	2	(7)	6	12	14.8
<b>Information Technology (a)</b>													
Broadcom Corporation	BRCM	Neutral	16.6	23.4	24.4	23.4	(17)%	(12)%	5 %	(9)%	16 %	42 %	22.6
Computer Associates Intl.	CA	Neutral	2.2	18.2	20.0	18.2	(19)	9	10	(1)	4	9	13.5
Electronic Arts	ERTS	Buy	7.9	14.5	15.5	14.5	(12)	(9)	(8)	(10)	4	78	20.8
Altera Corp.	ALTR	Neutral	10.0	9.7	9.6	9.7	29	(43)	49	3	9	35	25.4
Oracle Corp.	ORCL	Buy	1.9	10.1	9.1	9.1	11	10	(10)	3	5	8	14.5
LSI Logic	LSI	Buy	2.5	7.9	7.8	7.8	31	(21)	(29)	(9)	12	NM	31.5
NVIDIA Corp.	NVDA	Neutral	7.3	4.9	4.7	4.9	114	(66)	(12)	(14)	12	NM	34.2
KLA-Tencor Corp.	KLAC	Buy	3.0	6.2	6.3	6.2	(56)	(43)	13	(34)	13	NM	NM
Applied Materials	AMAT	Buy	4.3	7.4	6.0	6.0	(2)	(12)	(3)	(5)	28	NM	66.5
Xilinx, Inc	XLNX	Neutral	5.5	6.0	5.8	5.8	(60)	21	(16)	(26)	3	16	24.0
QUALCOMM Inc.	QCOM	Buy	7.8	5.5	5.7	5.7	103	(29)	11	17	13	27	21.0
<b>Materials</b>													
Allegheny Technologies Inc	ATI	Neutral	4.3	3.4	2.3	3.4	15 %	(15)%	(43)%	(18)%	16 %	NM	49.0
Monsanto Co.	MON	Neutral	1.8	1.8	1.8	1.8	65	6	0	20	5	2	20.1
<b>Telecommunication Services</b>													
MetroPCS Communications	PCS	Buy	3.7	2.2	1.9	2.2	36 %	(22)%	(4)%	1 %	14 %	69 %	14.2
Verizon Communications	VZ	Buy	1.2	1.1	1.0	1.1	(2)	(0)	(1)	(1)	2	4	12.1
<b>Average of Top 50 (equal-weighted)</b>			<b>4.2</b>	<b>5.0</b>	<b>4.7</b>	<b>4.8</b>	<b>18 %</b>	<b>(6)%</b>	<b>(2)%</b>	<b>(1)%</b>	<b>8 %</b>	<b>14 %</b>	<b>18.3</b>
<b>S&amp;P 500 (equal-weighted, ex-Fins and Utilities)</b>			<b>2.1</b>	<b>2.2</b>	<b>2.2</b>	<b>2.2</b>	<b>6</b>	<b>(17)</b>	<b>7</b>	<b>(3)</b>	<b>6</b>	<b>14</b>	<b>18.3</b>

(a) Healthcare and Information Technology companies are ranked by capex+R&amp;D / depreciation

Source: Compustat and Goldman Sachs Global ECS Research.

## Appendix A: 2008 top Capex and R&D Spenders

### Exhibit 33: Top Capex Spenders

Top 10 Companies ranked by 2008 Capex Spending								
Company	Ticker	Sector	Rating	2008A Capex \$ billions	2008A R&D \$ billions	Capex as % Investments for Growth	GS Bottom-up	
							2009E \$ billions	2010E \$ billions
AT & T Inc.	T	Telecommunication Services	Buy	20	1	96 %	17	17
Chevron Corp.	CVX	Energy	Neutral	20	1	96	18	18
Exxon Mobil Corp.	XOM	Energy	Neutral	19	1	96	23	22
ConocoPhillips	COP	Energy	Neutral	19	0	99	12	14
Chesapeake Energy Corp.	CHK	Energy	Buy	18	0	100	5	4
Verizon Communications	VZ	Telecommunication Services	Buy	17	0	100	17	17
General Electric	GE	Industrials	Buy	16	3	84	2	2
XTO Energy	XTO	Energy	Neutral	13	0	100	3	3
Wal-Mart Stores	WMT	Energy	Neutral	11	3	79	3	3
Devon Energy Corp.	DVN	Energy	Buy	9	0	100	5	6
<b>Total Top 10</b>				<b>163</b>	<b>9</b>	<b>95</b>	<b>108</b>	<b>108</b>
<b>Top 10 as % of S&amp;P 500 Total</b>				<b>28</b>	<b>5</b>			

Source: Compustat and Goldman Sachs Global ECS Research. (a) S&P 500 total excluding Financials and Utilities.

### Exhibit 34: Top R&D Spenders

Top 10 Companies ranked by 2008 R&D Spending								
Company	Ticker	Sector	Rating	2008A Capex \$ billions	2008A R&D \$ billions	R&D as % Investments for Growth	GS Bottom-up	
							2009E \$ billions	2010E \$ billions
Eli Lilly & Co.	LLY	Health Care	Sell	1	9	90 %	4	4
Pfizer, Inc.	PFE	Health Care	Buy	2	9	83	8	10
Microsoft Corp.	MSFT	Information Technology	Buy	3	8	72	9	9
Johnson & Johnson	JNJ	Health Care	Neutral	3	8	72	7	7
Ford Motor	F	Consumer Discretionary	Buy	7	7	52	0	0
International Bus. Machines	IBM	Information Technology	Neutral	4	6	59	6	6
Intel Corp.	INTC	Information Technology	Neutral	5	6	52	5	6
Cisco Systems	CSCO	Information Technology	Neutral	1	5	80	5	5
Merck & Co.	MRK	Health Care	Buy	1	5	79	5	9
Motorola Inc.	MOT	Information Technology	Neutral	1	4	89	3	3
<b>Total Top 10</b>				<b>28</b>	<b>66</b>	<b>70</b>	<b>51</b>	<b>42</b>
<b>Top 10 as % of S&amp;P 500 Total</b>				<b>5</b>	<b>34</b>			

Source: Compustat and Goldman Sachs Global ECS Research.

### Exhibit 35: Top Combined Capex and R&D Spenders

Top 10 Companies ranked by 2008 Total Investments for Growth								
Company	Ticker	Sector	Rating	2008A Capex \$ billions	2008A R&D \$ billions	Combined Capex + R&D \$ billions	GS Bottom-up	
							2009E \$ billions	2010E \$ billions
AT & T Inc.	T	Telecommunication Services	Buy	20	1	21	17	17
Chevron Corp.	CVX	Energy	Neutral	20	1	21	18	18
Exxon Mobil Corp.	XOM	Energy	Neutral	19	1	20	23	22
ConocoPhillips	COP	Energy	Neutral	19	0	19	12	14
General Electric	GE	Industrials	Buy	16	3	19	7	6
Chesapeake Energy Corp.	CHK	Energy	Buy	18	0	18	5	4
Verizon Communications	VZ	Telecommunication Services	Buy	17	0	17	17	17
Wal-Mart Stores	WMT	Consumer Staples	Neutral	11	0	15	12	13
Ford Motor	F	Consumer Discretionary	Buy	7	7	14	5	6
XTO Energy	XTO	Energy	Neutral	13	0	13	3	3
<b>Total Top 10</b>				<b>160</b>	<b>13</b>	<b>176</b>	<b>121</b>	<b>122</b>
<b>Top 10 as % of S&amp;P 500 Total</b>				<b>28</b>	<b>7</b>			

Source: Compustat and Goldman Sachs Global ECS Research.

## Appendix B: S&P 500 annual capex data

Exhibit 36: Top ten S&P 500 capex spenders over time

Top 10 Companies ranked by Capital Expenditures (\$ billions)																					
	2000		2001		2002		2003		2004		2005		2006		2007		2008		1Q 2009		
1	GM	\$32	GM	\$27	GM	\$24	GM	\$19	GM	\$22	GMGM	\$24	GMGM	\$25	GE	\$18	T	\$20	CVX	\$6	
2	VZ	18	VZ	17	GE	13	XOM	13	VZ	13	VZ	15	VZ	17	T	18	CVX	20	XOM	5	
3	GE	14	GE	16	VZ	12	VZ	12	GE	13	WMT	15	GE	17	VZ	18	XOM	19	VZ	4	
4	SBC	13	SBC	11	XOM	11	WMT	10	WMT	12	GE	14	WMT	16	CVX	17	COP	19	T	3	
5	T	13	T	11	WMT	9	GE	10	XOM	12	XOM	14	COP	16	XOM	15	CHK	18	COP	3	
6	F	10	XOM	10	CVX	8	F	8	COP	9	COP	12	XOM	15	WMT	15	VZ	17	WMT	3	
7	XOM	8	CVX	10	F	7	AIG	7	F	7	CVX	9	CVX	14	COP	12	GE	16	GE	3	
8	WMT	8	Q	9	SBC	7	COP	6	CVX	6	AIG	8	CHK	9	CHK	10	XTO	13	CHK	2	
9	BLS	7	F	8	T	7	CVX	6	AIG	6	F	8	T	8	GMGM	8	WMT	11	DVN	2	
10	INTC	7	WMT	8	AIG	6	SBC	5	SBC	5	INTC	6	S	8	XTO	7	DVN	9	CCL	2	
<b>Sum</b>		<b>\$130</b>		<b>\$127</b>		<b>\$105</b>		<b>\$95</b>		<b>\$106</b>		<b>\$124</b>		<b>\$144</b>		<b>\$137</b>		<b>\$163</b>		<b>\$32</b>	
<b>% of Total</b>		<b>31%</b>		<b>29%</b>		<b>28%</b>		<b>28%</b>		<b>29%</b>		<b>30%</b>		<b>29%</b>		<b>26%</b>		<b>29%</b>		<b>29%</b>	

Source: Compustat and Goldman Sachs Global ECS Research.

Exhibit 37: Annual S&P 500 capex data

Capital Expenditures (\$ billions)											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	1Q 2009	
Consumer Discretionary	\$84	\$73	\$69	\$67	\$72	\$77	\$85	\$72	\$66	\$12	
Consumer Staples	32	32	32	32	34	39	44	47	45	10	
Energy	38	55	50	51	60	75	111	123	170	34	
Financials	20	21	22	23	22	29	30	34	30	6	
Health Care	18	21	22	24	22	22	21	22	23	4	
Industrials	50	53	44	38	46	50	54	56	58	10	
Information Technology	48	42	27	24	27	30	38	40	40	7	
Materials	18	16	13	12	13	16	19	21	24	4	
Telecommunication Services	70	74	46	38	37	33	40	45	44	8	
Utilities	43	55	47	35	34	39	49	55	67	16	
<b>S&amp;P 500</b>	<b>\$420</b>	<b>\$441</b>	<b>\$372</b>	<b>\$343</b>	<b>\$367</b>	<b>\$410</b>	<b>\$492</b>	<b>\$515</b>	<b>\$566</b>	<b>\$111</b>	

Sector Share of Capital Expenditures											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	1Q 2009	
Consumer Discretionary	20%	17%	19%	20%	20%	19%	17%	14%	12%	11%	
Consumer Staples	8	7	9	9	9	10	9	9	8	9	
Energy	9	12	14	15	16	18	23	24	30	30	
Financials	5	5	6	7	6	7	6	7	5	5	
Health Care	4	5	6	7	6	5	4	4	4	4	
Industrials	12	12	12	11	13	12	11	11	10	9	
Information Technology	12	10	7	7	7	7	8	8	7	6	
Materials	4	4	3	4	4	4	4	4	4	4	
Telecommunication Services	17	17	12	11	10	8	8	9	8	7	
Utilities	10	12	13	10	9	9	10	11	12	14	
<b>S&amp;P 500</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	

Capital Expenditures (y/y % growth)										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	
Consumer Discretionary	2 %	(13)%	(6)%	(3)%	7 %	7 %	11 %	(15)%	(9)%	
Consumer Staples	6	(1)	1	0	7	13	13	6	(5)	
Energy	11	44	(8)	2	17	25	49	11	38	
Financials	3	8	2	4	(3)	34	4	11	(10)	
Health Care	3	14	9	6	(5)	(2)	(7)	9	3	
Industrials	(5)	7	(17)	(15)	23	9	8	4	2	
Information Technology	52	(13)	(35)	(11)	12	11	26	4	1	
Materials	(6)	(12)	(20)	(2)	8	23	16	13	12	
Telecommunication Services	30	6	(38)	(18)	(3)	(10)	22	12	(2)	
Utilities	24	27	(15)	(26)	(3)	15	27	11	22	
<b>S&amp;P 500</b>	<b>12 %</b>	<b>5 %</b>	<b>(16)%</b>	<b>(8)%</b>	<b>7 %</b>	<b>12 %</b>	<b>20 %</b>	<b>5 %</b>	<b>10 %</b>	

Source: Compustat and Goldman Sachs Global ECS Research.

## Appendix C: Top and bottom companies by 2010 capex growth

### Exhibit 38: Top Capex spenders by 2010 Capex growth

Top 20 S&P 500 Companies ranked by 2010 Capex Growth (%)						
Company	Ticker	Sector	Rating	Capex (\$ millions)		Growth (%) 2010
				2009	2010	
Novellus Systems	NVLS	Information Technology	Sell	7	28	324 %
Advanced Micro Devices	AMD	Information Technology	Sell	671	1,800	168
Pioneer Natural	PXD	Energy	Buy	347	896	158
Fortune Brands, Inc.	FO	Consumer Discretionary	Neutral	100	249	149
Nucor Corp.	NUE	Materials	Buy	420	1,000	138
D. R. Horton	DHI	Consumer Discretionary	Buy	14	33	131
ProLogis	PLD	Financials	Sell	276	625	126
Micron Technology	MU	Information Technology	Sell	660	1,263	91
Google Inc.	GOOG	Information Technology	Buy	1,302	2,400	84
Lennar Corp	LEN	Consumer Discretionary	Sell	11	20	79
Microchip Technology Inc.	MCHP	Information Technology	Sell	37	64	73
Apartment Investment & Mgmt'A'	AIV	Financials	Neutral	119	199	67
Boston Properties	BXP	Financials	Buy	226	369	63
PACCAR Inc.	PCAR	Industrials	Neutral	104	167	61
Cognizant Tech Solutions	CTSH	Information Technology	Buy	144	227	57
Peabody Energy Corp.	BTU	Energy	Buy	384	601	57
MeadWestvaco Corporation	MWV	Materials	Neutral	200	300	50
KB Home	KBH	Consumer Discretionary	Sell	5	7	50
Altera Corp.	ALTR	Information Technology	Neutral	23	34	49
Laboratory Corp. of America Holdings	LH	Health Care	Neutral	121	179	48

Source: Compustat and Goldman Sachs Global ECS Research.

### Exhibit 39: Bottom Capex spenders by 2010 Capex growth

Top 20 S&P 500 Companies ranked by 2010 Capex Growth (%)						
Company	Ticker	Sector	Rating	Capex (\$ millions)		Growth (%) 2010
				2009	2010	
Cb Richard Ellis Group Inc	CBG	Financials	Neutral	182	40	(78)%
CF Industries Holdings	CF	Materials	Not Rated	250	75	(70)
Diamond Offshore Drilling	DO	Energy	Neutral	930	400	(57)
Janus Capital Group	JNS	Financials	Neutral	46	20	(56)
Nabors Industries Ltd.	NBR	Energy	Sell	1,086	500	(54)
Alcoa Inc	AA	Materials	Neutral	1,800	850	(53)
Gilead Sciences	GILD	Health Care	Neutral	239	120	(50)
Watson Pharmaceuticals	WPI	Health Care	Sell	97	55	(43)
Rowan Cos.	RDC	Energy	Neutral	560	320	(43)
Allegheny Technologies Inc	ATI	Materials	Neutral	437	250	(43)
Vornado Realty	VNO	Financials	Neutral	395	230	(42)
AvalonBay Communities	AVB	Financials	Sell	573	346	(40)
Smith International Inc.	SII	Energy	Buy	245	150	(39)
American Electric Power	AEP	Utilities	Buy	2,896	1,820	(37)
Penney (J.C.)	JCP	Consumer Discretionary	Neutral	629	415	(34)
Wyndham Worldwide	WYN	Consumer Discretionary	Neutral	150	100	(33)
American Tower Corporation	AMT	Telecommunication Services	Buy	270	180	(33)
Medco Health Solutions Inc.	MHS	Health Care	Buy	238	160	(33)
Halliburton Co.	HAL	Energy	Neutral	1,900	1,300	(32)
Starwood Hotels & Resorts	HOT	Consumer Discretionary	Buy	320	220	(31)

Source: Compustat and Goldman Sachs Global ECS Research.

## Appendix D: Top and bottom companies by 2010 capex change

### Exhibit 40: Top Capex spenders by 2010 Capex change

#### Top 20 S&P 500 Companies ranked by 2010 Capex Change (\$ millions)

Company	Ticker	Sector	Rating	Capex (\$ millions)		Change (\$) 2010
				2009	2010	
Apache Corp.	APA	Energy	Neutral	3,462	5,063	1,601
Occidental Petroleum	OXY	Energy	Neutral	3,603	4,965	1,363
ConocoPhillips	COP	Energy	Neutral	12,456	13,606	1,150
Advanced Micro Devices	AMD	Information Technology	Sell	671	1,800	1,129
Google Inc.	GOOG	Information Technology	Buy	1,302	2,400	1,098
Wal-Mart Stores	WMT	Consumer Staples	Neutral	12,302	13,189	887
Ford Motor	F	Consumer Discretionary	Buy	5,325	6,183	858
Hess Corp.	HES	Energy	Buy	3,130	3,900	770
Sprint Nextel Corp.	S	Telecommunication Services	Neutral	1,797	2,533	736
Noble Energy	NBL	Energy	Neutral	1,457	2,080	624
Micron Technology	MU	Information Technology	Sell	660	1,263	603
Nucor Corp.	NUE	Materials	Buy	420	1,000	580
Sempra Energy	SRE	Utilities	Neutral	2,157	2,718	561
Pioneer Natural	PXD	Energy	Buy	347	896	549
EOG Resources	EOG	Energy	Buy	2,713	3,194	481
Devon Energy Corp.	DVN	Energy	Buy	5,300	5,750	450
Duke Energy	DUK	Utilities	Neutral	4,244	4,676	433
Intel Corp.	INTC	Information Technology	Neutral	4,790	5,200	410
ProLogis	PLD	Financials	Sell	276	625	349
Hewlett-Packard	HPQ	Information Technology	Buy	3,437	3,784	347

Source: Compustat and Goldman Sachs Global ECS Research.

### Exhibit 41: Bottom Capex spenders by 2010 Capex change

#### Bottom 20 S&P 500 Companies ranked by 2010 Capex Change (\$ millions)

Company	Ticker	Sector	Rating	Capex (\$ millions)		Change (\$) 2010
				2009	2010	
Exxon Mobil Corp.	XOM	Energy	Neutral	23,201	22,062	(1,139)
American Electric Power	AEP	Utilities	Buy	2,896	1,820	(1,076)
Alcoa Inc	AA	Materials	Neutral	1,800	850	(950)
El Paso Corp.	EP	Energy	Buy	2,784	2,125	(659)
Target Corp.	TGT	Consumer Discretionary	Buy	2,257	1,651	(606)
Halliburton Co.	HAL	Energy	Neutral	1,900	1,300	(600)
Nabors Industries Ltd.	NBR	Energy	Sell	1,086	500	(586)
Diamond Offshore Drilling	DO	Energy	Neutral	930	400	(530)
Microsoft Corp.	MSFT	Information Technology	Buy	2,591	2,079	(513)
Chesapeake Energy Corp.	CHK	Energy	Buy	4,841	4,334	(507)
Lowe's Cos.	LOW	Consumer Discretionary	Buy	2,286	1,814	(471)
General Electric	GE	Industrials	Buy	2,452	2,038	(413)
Progress Energy, Inc.	PGN	Utilities	Neutral	2,800	2,449	(351)
Baker Hughes	BHI	Energy	Buy	1,131	800	(331)
Coca-Cola Co.	KO	Consumer Staples	Buy	1,900	1,570	(330)
Caterpillar Inc.	CAT	Industrials	Sell	1,292	1,000	(292)
Rowan Cos.	RDC	Energy	Neutral	560	320	(240)
EnSCO International Inc.	ESV	Energy	Buy	792	556	(236)
AvalonBay Communities	AVB	Financials	Sell	573	346	(227)
Walgreen Co.	WAG	Consumer Staples	Neutral	1,841	1,618	(223)

Source: Compustat and Goldman Sachs Global ECS Research.

**Exhibit 42: The Bottom Line**

Our key forecasts for the S&amp;P 500 index, recommended sector positioning and top thematic trade ideas; of August 27, 2009

S&P 500 Index Forecasts					
2009 year-end price target	1,060	3% above current price level of 1031			
<b>S&amp;P 500 EPS estimates</b>	<b>2007A</b>	<b>2008A</b>	<b>2009E</b>	<b>2010E</b>	
GS Portfolio Strategy top-down	\$83	\$50	\$52	\$75	
Growth (% year/year)	(6)	(40)	5	45	
Recommended Sector Positioning					
S&P 500 Sector	Recommended Positioning	GS Overweight / Underweight (a)	S&P 500 Weight	Total Return YTD	GS Alpha YTD
Energy	Overweight	300 bp	12%	5%	(17)bp
Materials		200	3	33	0
Financials		200	15	19	18
Information Technology		100	18	41	(2)
Industrials		100	10	9	1
Utilities	Neutral	0	4	4	13
Consumer Discretionary		0	9	25	(14)
Telecom Services	Underweight	(200)	3%	(0)	7
Health Care		(300)	14	10	(31)
Consumer Staples		(400)	11	6	(4)
S&P 500		0 bp	100%	16%	(28)bp
Thematic Trade Recommendations					
<b>Our best trade ideas: Portfolio Strategy thematic baskets (b)</b>				<b>Initiation</b>	
				<b>Date</b>	<b>Return</b>
<b>BUY High Operating Leverage (GSTHOPHI); SELL Low Operating Leverage (GSTHOPLO)</b>					
<i>See Macro to Micro Shift Part II: 2H 2009 Update (20-Jul-09).</i>				20-Jul-09	2.6 %
<b>BUY BRICs Sales Basket (GSTHBRIC); SELL S&amp;P 500</b>					
<i>See Portfolio Passport: Coming to America (5-Nov-08).</i>				4-May-09	7.6 %
<b>BUY Hedge Fund Very-Important-Position (VIP) list Basket (GSTHHVIP); SELL S&amp;P 500</b>					
<i>See Hedge Fund Trend Monitor: Fund (24-Aug-09).</i>				24-Aug-09	(0.2)%

(a) Sector weightings last rebalanced on 20-Jul-09. (b) US Portfolio Strategy baskets may be found on Bloomberg by typing <GSSU5>. The Bloomberg page provides real-time basket performance and current basket constituents. To obtain access to our baskets on Bloomberg, please contact your Goldman Sachs salesperson. The ability to trade these baskets will depend upon market conditions, including liquidity and borrow constraints at the time of trade.

Source: FactSet and Goldman Sachs Global ECS Research.

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The Equities Division of the firm has previously introduced the basket of securities discussed in this report. The Equity Analyst may have been consulted as to the composition of the basket prior to its launch. However, the views expressed in this research and its timing were not shared with the Equities Division.

## RegAC

I, David J. Kostin, hereby certify that all of the views expressed in this report accurately reflect my personal views about the subject company or companies and its or their securities. I also certify that no part of my compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

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Goldman Sachs Investment Research global coverage universe

	Rating Distribution			Investment Banking Relationships		
	Buy	Hold	Sell	Buy	Hold	Sell
Global	30%	51%	19%	54%	52%	44%

As of July 1, 2009, Goldman Sachs Global Investment Research had investment ratings on 2,709 equity securities. Goldman Sachs assigns stocks as Buys and Sells on various regional Investment Lists; stocks not so assigned are deemed Neutral. Such assignments equate to Buy, Hold and Sell for the purposes of the above disclosure required by NASD/NYSE rules. See 'Ratings, Coverage groups and views and related definitions' below.

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