



HUMAN CAPITAL
MANAGEMENT INSTITUTE

Linking Human Capital to Business Performance

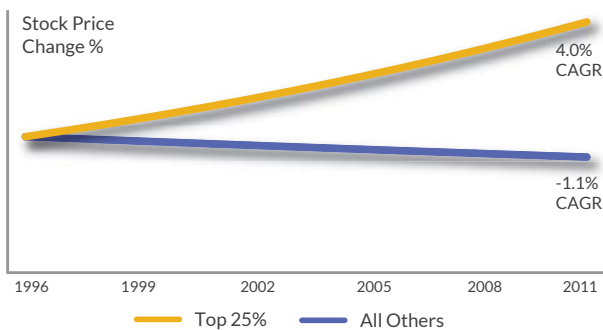


Jeff Higgins, CEO HCMI &
Dr. Donald Atwater, Pepperdine University - Graziadio
School of Business and Management

Contributions by:
Harish Reddy Sidda, Jody Gilmyers, Magdalena Tucker,
Grant Cooperstein, Maria Luisa Noguera, Matthew Lemert
and Bill Gilmyers

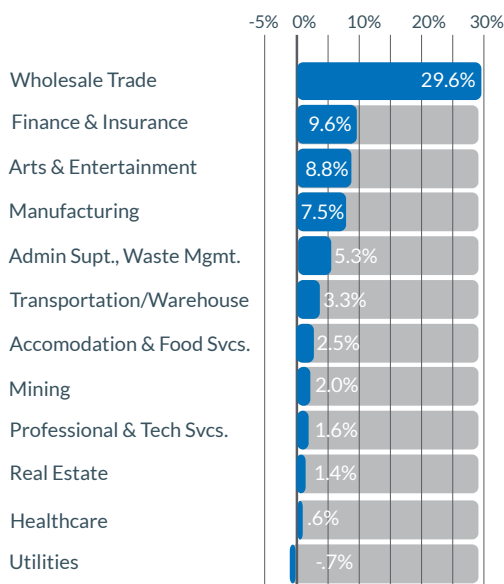
Executive Summary

Chart 1:
Stock Performance - (Finance & Insurance Sector)



Company Performance on Human Capital Metrics

Chart 2:
Rate of Gain in Stock Price per 10% Gain in Human Capital Metrics (by Industry Sector)



What if human capital could be valued and its contribution quantified in the form of productivity or return? What if the return on human capital could be definitively linked to business results? In essence:

Can changes in human capital metrics explain movements (i.e., predict) in stock performance for companies? The answer is YES!

This white paper lays out detailed analysis and evidence to support the conclusion that human capital metrics can successfully predict public company stock price changes (i.e., performance). A secondary purpose is to focus attention on the current lack of human capital information disclosed in public company reporting. This paper clearly shows the linkage of human capital metrics to stock performance, and includes deeper analysis of two industry sectors and several publicly traded companies.

For this paper, over 22,000 companies were studied and six human capital metrics were tested using 16 years of public company data from 1996 to 2011. Overall, year-over-year movements in select human capital metrics are strongly associated with stock price changes. Our multivariate linear regression model was not only found to be significant, but also showed an important alternate view of industry performance versus traditional financial metrics and macroeconomic indicators.

Research Key Findings

- **Human capital impact on stock performance can be calculated.** The study shows human capital (HC) contributions to stock performance are clearly linked. Chart 1 shows Finance & Insurance sector company stock performance based on each company's human capital metric changes over time. The top 25% of companies improved HC metrics by 51% seeing 4.0% average annual stock price gains and 66.0% overall. All other companies had 52% HC metric declines, losing -1.1% in stock price annually and -14.8% overall.
- **The relationship of changes in human capital metrics varies by industry.** According to our model, a 10% increase in human capital productivity metrics (see metrics list in Section II) are associated with stock price gains of -.7% to 29% by sector (see Chart 2). For example, a 10% gain in key human capital metrics for a typical financial services company results in a 9.6% stock price gain.

Chart 2 - Note:

Based on two different predictive stock models (Model A and Model B) using different combinations of the listed human capital metrics, stock prices in 11 of 12 sectors showed improvement with a 10% increase (i.e., gain) in HC metrics. From high to low human capital-intensive sectors, gains in human capital metrics showed a positive stock price impact.

Recommendation:

Based on our study and findings, we recommend that investors raise the bar and improve their ability to spot high-performing companies through use of selected human capital metrics.

Get Benchmarked!

Want a better look at your Workforce data?
Take part in our Human Capital Survey!

In conjunction with this white paper, we are launching a free, web-based workforce productivity survey. This one-of-a-kind survey will allow you to obtain productivity metrics for your organization and will also benchmark it against industry competitors.

The survey is free & easy-to-use.
Don't miss your chance to benchmark your company and obtain essential workforce productivity metrics!

Visit hcmInst.com for more info.

- **New Financial Metric Total Cost of Workforce (TCOW) proves superior to traditional Revenue per FTE or Profit per FTE** in explaining stock price changes. Traditional Revenue and Profit per FTE matter, but TCOW strongly explains stock price change (white paper Total Cost of Workforce, 2010).

- **Return on Human Capital Investment (Return on HCI)¹ is the most significant human capital metric in predicting stock price changes across sectors.**

- **Human capital metrics are significant in all sectors explaining 35% to 64% of rate of change in stock prices**, far more than the average 1% explained by net income.

- **Human capital metrics reveal surprising and alarming pictures of industry performance.** The study showed surprising productivity winners (Administrative Support & Waste Management Services) and losers (Financial Services & Insurance) over a study period with multiple market cycles including:

- False winner sectors with large gains in Revenue per FTE or Profit per FTE (headcount increased less or even declined) versus growing revenue and profits. However, these same sectors failed to control TCOW, meaning TCOW rose faster than revenue or profit. Thus, while headcount was controlled, workforce cost was not.

- **Financial Services workforce productivity declined more than other industries.** Often cited as being a highly productive industry, this sector showed negative productivity in Human Capital ROI Ratio² (HC ROI Ratio) of -10.4% and Return on HCI of -15.0%.

- *The Investment Banking industry performed poorly on productivity in the study. As median Revenue per FTE increased 21.8% (good news), median HC ROI Ratio dropped (-29.0%) while TCOW ballooned 47.5% (bad news), negatively impacting performance. This suggests that fewer workers receive an ever larger share of industry revenue calling into question whether investors are properly rewarded by publicly traded companies in the study.*

¹ Return on Human Capital Investment (Return on HCI)* compares TCOW versus a selected Net Operating Profit metric (i.e., NOPAT). This metric shows the expected percent return of \$1 invested in workforce if all other factors remain constant. In some cases, HC ROI Ratio and Return on HCI may return similar results.

² Human Capital ROI Ratio (HC ROI Ratio)* measures the ratio of return on revenue (net of non-workforce expenses) versus Total Cost of the Workforce (“TCOW”). HC ROI Ratio acts as a measure of expected return on \$1 invested in the workforce if all other factors remain constant. For example, an organization with a Human Capital ROI Ratio of 1.20 indicates that for every \$1.00 invested in cost of the workforce, \$1.20 is returned as profit or a 20% return on people.

*See Appendix A for formula calculations.

I. The Value of the Emerging View

We’ve all heard the phrase: “workers are our most valuable ‘asset’... and our biggest ‘cost.’” Translated, this means when markets are growing, businesses treat their workers as assets; in a downturn, they become costs to be cut and minimized. Implicit in this way of thinking is that a workforce and its skills are plentiful, quickly hired/replaced and, with necessary costs, easily cut.

But where should a line be drawn on which workers are treated as human capital assets and when they are to be treated as such? These are difficult but important questions because if a group of workers is assumed expendable and in reality is not, then market opportunities are lost, costs rise, economic performance drops and firm value (i.e., shareholder value) does not meet its potential.

For many years, theories have existed about the contribution of people to company performance. Some theories focus on productivity measures and how productivity increases and reduced costs are the consequence of adding more physical capital (e.g., computing technologies and smarter systems) to a company’s balance sheet. Physical capital got all the credit and return-on-investment calculations for physical capital were widely used to show strengths and weaknesses of business performance. Human capital

was relegated to a secondary position and as a result, even basic headcount reporting practices can be widely inaccurate (Atwater, Jorgensen 2008). Today, robust analytical information on workers, their costs, and contributions exists but is minimal and mostly available at a high level for large public organizations.

In our analysis, movements in human capital measures are analyzed in terms of contribution to changes in established business performance measures. The primary business performance measure is year-over-year movement in common stock share price.

We hope this work stimulates discussion, creates a rationale for greater interest in human capital metrics, and increases availability of human capital data.

Study Parameters:

HCMI's study leveraged dozens of financial, economic and human capital data elements, a subset of which were included in a multivariate linear regression analysis.

- 16 year analysis period, 1996-2011
- 22,100 companies included in study
- 17 variables analyzed (7 excluded in final model)
- 12 of 13 industry sectors analyzed
- 50,000 companies in Compustat database
- 6 human capital variables included

II. Analysis Scope and Data

While investigating the relationship between human capital management practices and the financial impact that those practices have on organization performance, it became evident that the key question to answer is not “does it matter if organizations manage their human capital well?” rather, it is, “how much and in what ways should companies invest in talent management practices to maximize shareholder return?” In a nutshell, what level of resources should be devoted to managing or optimizing human capital?

Human Capital Financial Statements (HCF\$™):

The study uses metrics from the Human Capital Financial Statements (HCF\$™) originally introduced in 2010 by HCMI.

The statements include a comprehensive set of advanced metrics enabling organizations to quantify the impact of human capital investments in much the same way as traditional financial statements do for business.

Visit hcminst.com for more info.

Correlation vs. Causation

If companies place an emphasis on managing their human capital effectively, what impact does it have? If there is a relationship between doing so and financial results, is the relationship causal or just correlative? In other words, are companies with strong financial results in a better position to be able to afford to invest in the area of human capital or are companies that invest in human capital reaping financial rewards from those investments over time? Which drives which? It is also theoretically possible that there is no causation – that they are not directly linked - but merely correlated to some other variable that impacts both independently (i.e., an improving economy or falling taxes). This question of causation is important. If there is an actual statistical or causal link and human capital investments do indeed positively impact financial outcomes, then it forms the foundation for ROI-based business cases for investments in human capital.

As part of our study we investigated multiple industry sectors using a set of human capital metrics as well as traditional financial metrics and macro-economic variables. The goal was to try and demonstrate the link between human capital and a company's financial success while controlling for economic conditions, inflation, tax rates, and more. In addition, we leveraged detailed research data gathered from organizations utilizing [Human Capital Financial Statements \(HCF\\$™\)](#) to add more detailed human capital data at both industry- and company-specific levels. The additional data allow for greater testing and insight into the relationship between workforce optimization strategies, bottom-line financial results, and stock price changes. This analysis addresses the chicken-and-the-egg problem with regard to whether human capital management performance drives financial performance, vice versa, or neither.

The idea of a human capital link to stock price relationship is not new. Research by Dr. Lauri Bassi, CEO of McBassi and Company, and other human capital research thought leaders (Bontis & Fitz-enz, 2002) showed what appeared to be a clear linkage between investments in human capital and public U.S. companies' stock prices (Bassi, Harrison, Ludwig, & McMurrer, 2004). Others have also done parallel work such as AON Hewitt's Mark Ubelhart, practice leader of Value Based Management and architect of Human Capital Foresight who conducted research connecting human capital metrics to financial

Table 1:
Human Capital Metrics tested in the predictive model

Metrics:
Profit per FTE
Revenue per FTE
Human Capital ROI Ratio (HC ROI Ratio)
Return on Human Capital Investment (Return on HCI)
Total Cost of Workforce Percent of Operating Expenses (TCOW % of Operating Expenses)
Total Cost of Workforce Percent of Revenue (TCOW % of Revenue)

Table 2:
Other variables tested in the predictive model

Variables:
Net Income
Real Gross Domestic Product
Bank Prime Loan Rate
Actual vs. Natural Unemployment Rate
Producer Price Index
Consumer Price Index
Industrial Production Index
S&P 500 Index

Notes on Table 1 & 2

- Organizations with less than 1000 employees or missing workforce cost-headcount data, were excluded from the analysis.
- The Retail Trade Sector was excluded due to inadequate and inaccurate workforce cost information.
- Data on each sector's description, size, and major sub-sectors are included in Appendix C: NAICS Business Sector Information.

results. The research made use of cross-company, longitudinal data from over 1000 companies and 20 million employees. The findings quantified relative impact of Pivotal Employee flow (top-quartile pay progressors adjusted for age, pay and tenure) on subsequent company Cash Flow Return on Investment (CFROI).

While there is still much to learn about how companies can best leverage human capital metrics to increase the impact of their workforce strategies on the bottom line and stock price, this white paper is a first step in shining a light on what, until now has often been seen as a “black box” for business leaders, HR, and the investment community. The insights noted here are, we believe, of significant value, which is only increasing as more organizations track and report human capital metrics, thus increasing the pool of available data for analysis and testing to financials and stock price.

Data Background:

Human capital and financial data from over 50,000 companies and 13 original business sectors (per North American Industry Classification System or “NAICS”) were gathered from the Compustat database over a 16-year period from 1996 – 2011 (see Appendix C: NAICS Business Sector Information).

The industry sectors included in the analysis were:

- Accommodation & Food Services
- Admin Support & Waste Mgmt/Remediation Services
- Arts & Entertainment
- Finance & Insurance
- Health Care
- Manufacturing
- Mining
- Professional, Scientific, & Technical Services
- Real Estate, Rental, & Leasing
- Transportation & Warehousing
- Utilities
- Wholesale Trade

For additional information on the human capital metrics used in the model, including metric definitions and formulas, see Appendix A: Definitions of Human Capital Metrics or visit www.hcminst.com.

Additional information including definitions and formulas for other variables tested and included in the model are shown in Appendix B: Descriptions of Other Metrics used in the Analysis.

The Model:

What is the value of human capital initiatives in terms of increasing shareholder value? While clearly valuable, those wishing to replicate these findings may discover that due to untracked, unreported and missing human capital data, this analysis can be difficult to replicate. In essence, the biggest limitation for having confidence in specific human capital programs by industry and individual company is solid workforce data. However, based on our research, an emerging view seems clear: with improved depth and breadth of human capital data, and good analytical methods, precise contributions of human capital to financial performance can be determined (see FC Corporation example below).

The complete set of human capital metrics shown in Table 1 and Table 2 were tested in a multivariate statistical model to analyze the various sectors. Table 3 below shows many of the variables included in the predictive model for three selected industry sectors. Table 3 also shows which variables were statistically significant in predicting stock price changes for the three selected sectors. While certain variables are consistently significant in predicting stock price changes, it is important to note that variables such as Bank Prime Loan Rates and Consumer Price Index have previously been shown in studies to be significant in predicting stock price changes.

Example: Predicting FC Corporation Share Price

As an example FC Corporation (pseudonym), can use three predictive human capital metrics* to analyze and predict stock price changes in the market for FC Corporation stock. FC Corp. has a \$60 common stock price and 35 million shares outstanding for a total market value of \$2.1 billion. The company identified target productivity programs to improve results by 5% in key human capital metrics*. The predicted change from a 5% gain in human capital metrics is:

= A \$2.00 per share gain, an increase in valuation of \$69 million or 3.3% to FC Corp. market value

Details on the prediction model used in this example are shown in section V Individual Company Case Studies.

* 3 Key human capital metrics include Human Capital ROI Ratio, Return on Human Capital Investment and Total Cost of Workforce % of Revenue are described in detail in the remainder of this white paper.

Note: The predictions are not the “total value” of human capital initiatives, but the INCREASE in shareholder value from one year’s human capital impact.

However, the big surprise finding was that several human capital metric variables were consistently significant, even more so than established predictive variables.

As discussed, year-over-year stock price gains and losses were explained by changes in net income, four human capital metrics, four economic condition variables, a constant term, and a high profit (greater than 100% change per year) binary tag variable (see Table 1 and Table 2). The contribution of a variable is the proportion of stock price movement that the coefficient times a given value represents. For example, if the coefficient of HC ROI Ratio is 0.3, the stock price gain is 4.0%, the value of HC ROI Ratio is 1.0%, and the contribution of HC ROI Ratio is 7.5% (0.3 times .01 divided by .04). The sum of contributions by all variables equals 100% of the explained movement (i.e., the R-squared value).

The contributions of human capital initiatives were analyzed and the results are shown for the Finance and Insurance industry sector and Transportation and Warehousing industry sector. The analysis focused on the following three human capital metrics: HC ROI Ratio, Return on HCI, and TCOW % of Revenue.

Interestingly, both high- and low-human-capital-intensity sectors showed significant stock price gains when modeled using a 10% improvement in human capital metrics (see highlights in Chart 2).



Table 3: Key
 Statistically Significant 
 Not Statistically Significant 

Table 3: Selected Metrics & Variables in Stock Price Model Equations

	<i>Accom. & Food Service</i>	<i>Finance & Insurance</i>	<i>Transport. & Warehouse</i>
Net Income	✓	✓	✗
Human Capital ROI Ratio	✓	✓	✓
Return on HCI	✓	✓	✓
TCOW % of Revenue or % of Operating Expense	✗	✓	✗
Consumer Price Index	✓	✓	✓
Real GDP	✗	✓	✗
Bank Prime Loan Rate	✓	✓	✓
Difference between Actual & Natural Unemp. Rate	✓	✓	✓

III. The Analysis

It is important to note that due to the size of the dataset (16 years of results for 50,000 publicly traded companies in 12 industry sectors across the globe), the analysis included and controlled for both good and bad economic conditions plus GDP growth/inflation rates/interest rates, high growth, slow growth, and no-growth industries and geographies. For these reasons we believe the findings are not only statistically significant, but represent a new paradigm in leading indicators of organizational success.

Hypothesis: “Stock Price changes can be explained (i.e., predicted) by Human Capital Metrics”

The analysis focused on year-over-year change in human capital metrics and business performance. A key hypothesis was that financially successful businesses (i.e., those that have rising share prices which are higher than competitors) have flexible and adaptable human capital programs. Such programs can control or even decrease workforce TCOW as a share of revenue or expenses, increase HC ROI Ratio and Return on HCI faster than others, resulting in better financial results.

The following pages include a more detailed explanation of the analyses in this study. Chart 3 shows the R-squared value or predictive power of the multivariate regression model by industry sector and its ability to explain movements in year-over-year stock prices. The closer the R-squared value is to 1, the stronger the predictive power of the model for each industry sector.

No bias for good economic times, geography, industry, or high-performing versus low-performing companies.

Since the data include high- and low-performing companies, bias toward high-performing company rapid stock price gains is neutralized. Further, the analysis period from 1996 to 2011 includes both high growth and weak economic environments so it is also not biased toward favorable economic conditions.

Beyond showing relationships, the metrics were factored into a statistical model to explain and predict company stock price changes as shown in Chart 2. In terms of their predictive power, the stock prediction models were able to explain from 35% to 64% of the

Chart 3:
R-Squared Value by Industry Sector.
R-Squared explains stock price change
(possible values between 0-1)

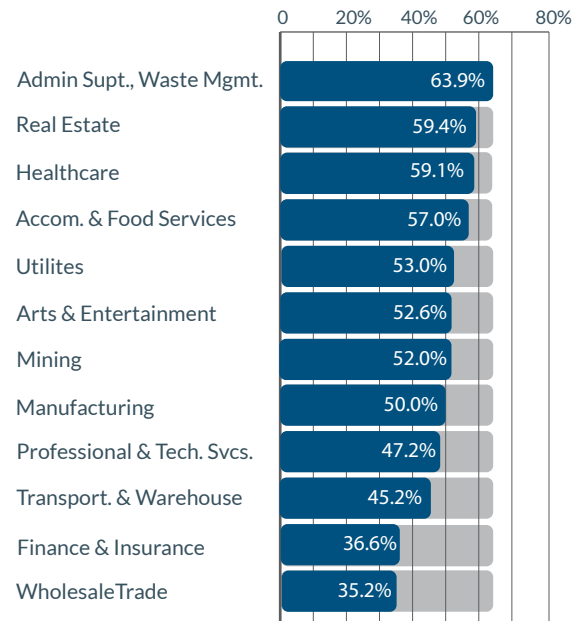


Chart 3 Note:
R-Squared as a percentage shows how much the model explains stock price changes. For example, 59.4% of variance in Real Estate stock price can be explained by the statistical model and variables.

variance (or change) in stock price shown in Chart 3 above. The obvious advantage of being able to predict stock price movement is that it can be used to predict individual company stock price performance in a given sector. Such a prediction, while not exactly accurate due to variations that occur between sectors and individual companies, should be directionally correct. It is worth noting that in every sector, human capital metrics were found to make significant predictive contributions to stock price performance.

An assumption was made that economic conditions affect financial performance so this meant that successful businesses had to simultaneously manage both human capital and economic conditions. This combination of talents (managing human capital in an uncertain economic world) has historically proven to be important. In many multinational companies - including IBM - bonuses are adjusted for economic conditions. Specifically, if a national market has strong positive economic conditions, then meeting targets has been found to be easier than in markets with poor economic growth and/or inflation. So the latter yields higher bonuses if targets are met.

Chart 4:
Traditional Financial Performance & Productivity by Industry
Correlation coefficient $r^2=89\%$ (Revenue per FTE to profit per FTE)

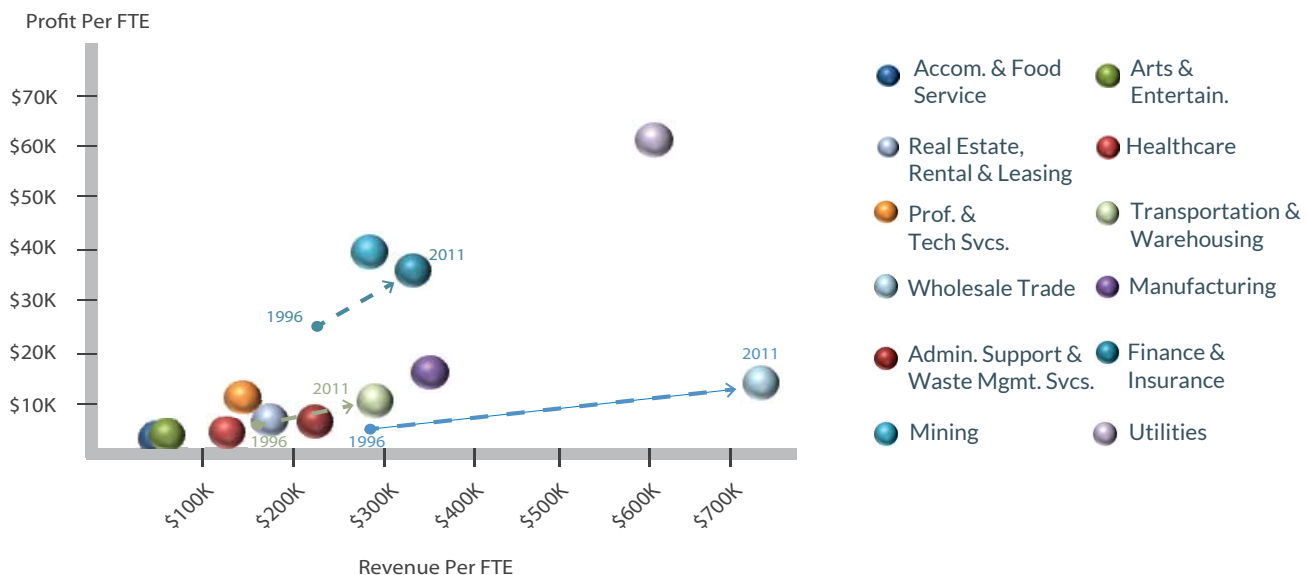


Chart 4 (above) shows two traditional financial performance metrics, Profit per FTE and Revenue per FTE, by industry sector. Chart 5, however, shows a new and different view of industry productivity over the same time span as the previous chart, revealing dramatically different results for many industry sectors. Chart 6 shows the sixteen-year total changes in two advanced productivity metrics broken down by industry sector.

Traditional Financial Performance/Productivity Trending by Industry :

When graphed, relationships between various human capital metrics emerge showing how different sectors' human capital performance compare against one another. Chart 4 below shows the industry performance for two well-established metrics: Revenue per FTE and Profit per FTE.

Gains in Headcount Productivity:

All sectors studied showed gains in the two headcount productivity metrics with median gains of 68% in Revenue per FTE and 149% in Profit per FTE from 1996-2011. The spread between sectors shows the top performing sector, Utilities, with 12 times greater Revenue per FTE and 35 times greater Profit per FTE than Accommodation & Food Services, the bottom performing sector (see Chart 4). Three sectors (Finance & Insurance, Transportation & Warehousing, and Wholesale Trade) have mapped lines showing their 1996 performance and movement up to 2011 (Chart 4). The largest gain overall was Wholesale Trade in which median Revenue per FTE increased by \$450,000 and Profit per FTE increased \$12,000 over the analysis period. The largest percentage improvement was Administrative Support & Waste Management Services, which had 471% and 3748% gains in Revenue per FTE and Profit per FTE respectively. This sector was a bottom performer in 1996, but surpassed five other sectors by 2011.

Is the Productivity Real?

While Revenue per FTE and Profit per FTE are commonly used metrics, our research shows that they are by no means the best predictors of financial success. This is because they only show changes in revenue and profit based on headcount rather than including cost changes in the workforce. The pretense of these metrics is that measuring headcount is a good proxy for measuring cost of workforce, but as our analysis and the forthcoming example "Business Case for Total Cost of Workforce" illustrates, this is a fallacy.

Since HC ROI Ratio, Return on HCI, TCOW % of Revenue and TCOW % of Operating Expense use workforce cost in some way, the hypothesis is that these are superior metrics to explain true performance and act as leading indicators of stock price change. This position is supported by the modeled statistical analysis, which shows that TCOW, HC ROI Ratio and Return on HCI are indeed strong predictive measures, linking closely to costs and profits and are more

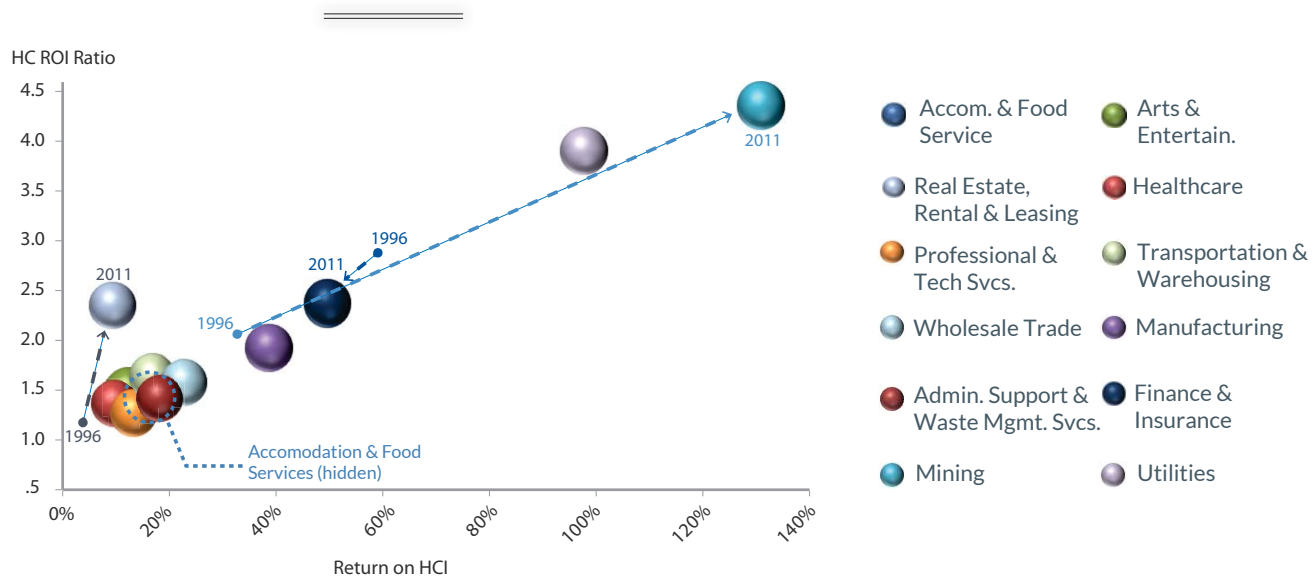
difficult for companies to manipulate. This new relationship can be seen in Chart 5.

Using select human capital metrics along with financial results enables quantification of real financial productivity by sector, industry, company and ultimately by job group within a company. Such insights could otherwise be hidden from management and investors, leading to incorrect interpretations and workforce decisions as shown by Revenue- and Profit-per-FTE metrics versus the new metrics.

New Productivity Insights

Using new metrics, this study identified new insights in Chart 5 below to reveal new story. Using HC ROI Ratio (a revenue-cost linked productivity metric) and Return on HCI (a profit-cost linked productivity metric) we see sector performance clustering in the lower left between 1.2 to 1.6 in HC ROI Ratio and 10% to 25% in Return on HCI. However, contrary to the prior Revenue per FTE and Profit per FTE (Chart 4), not all sectors improved during the analysis period. Finance and Insurance and Arts & Entertainment both declined from 1996 to 2011 (see Chart 6). The top percentage improvement sectors here were Mining with gains of 119% in HC ROI Ratio and 301.8% in Return on HCI, and Administrative Support & Waste Management Services gaining 23.1% in HC ROI Ratio and 273.7% in Return on HCI.

Chart 5:
Advanced Productivity Metrics by Industry
Correlation coefficient = 96% (HC ROI Ratio to Return on HCI)



Example: Business Case for Total Cost of Workforce (TCOW)

An organization with 100,000 employees at the end of 2010 and 100,000 employees at the end of 2011 would appear to have effectively controlled workforce cost by managing total workforce headcount. However, due to increases in benefits, wages, and changes in the workforce such as bonuses, promotions, and mix of jobs hired, organizations with flat headcount growth can easily (and often do) experience 10% or greater increases in Total Cost of Workforce (TCOW).

When calculated correctly, these metrics are superior workforce productivity measures and appear to be the truest indicators of both current and likely future productivity changes. When combined with a factor for the human capital intensity of each sector, these metrics show substantial statistical predictive power and link directly to financial results.

Mining, a relatively low-human-capital-intensity sector, improved by 302% in HC ROI Ratio, a compound annual growth rate (CAGR) of 9.7%, while Return on HCI improved 119%, a 5.4% CAGR (see chart 6). Perhaps more surprising are the productivity gains in Accommodation & Food Services (301.0% and 1.0% respectively), and Administrative Support & Waste Management Services (274% and 23% respectively). Both sectors are service driven and have high human-capital intensity which, by definition, makes it more challenging and also more rewarding to drive improved productivity returns. For example, the Mining sector benefited from increases in commodity prices and improvements in machinery technology, both of which contributed to the productivity gains; however, prices for Accommodation & Food Services plus Administrative Support & Waste Management Services have risen far more slowly, often less than inflation rate (2.47% US), which makes the strong productivity gains all the more impressive.

On the other end, Finance & Insurance lost productivity in Return on HCI and HC ROI Ratio (-15%, -10% respectively) contradicting conventional wisdom. Even worse, Arts & Entertainment had more severe drops in human-capital productivity in Return on HCI and HC ROI Ratio (-53%, -22% respectively). The analysis and productivity results do not show a clear relationship or trend between relative human-capital intensity in a given sector and productivity gains from 1996 to 2011. Four of the top five performing sectors and all four of the worst performing sectors in Return on HCI are high-human-capital-intensity sectors, which suggests that each sector is moving independently of other sectors.

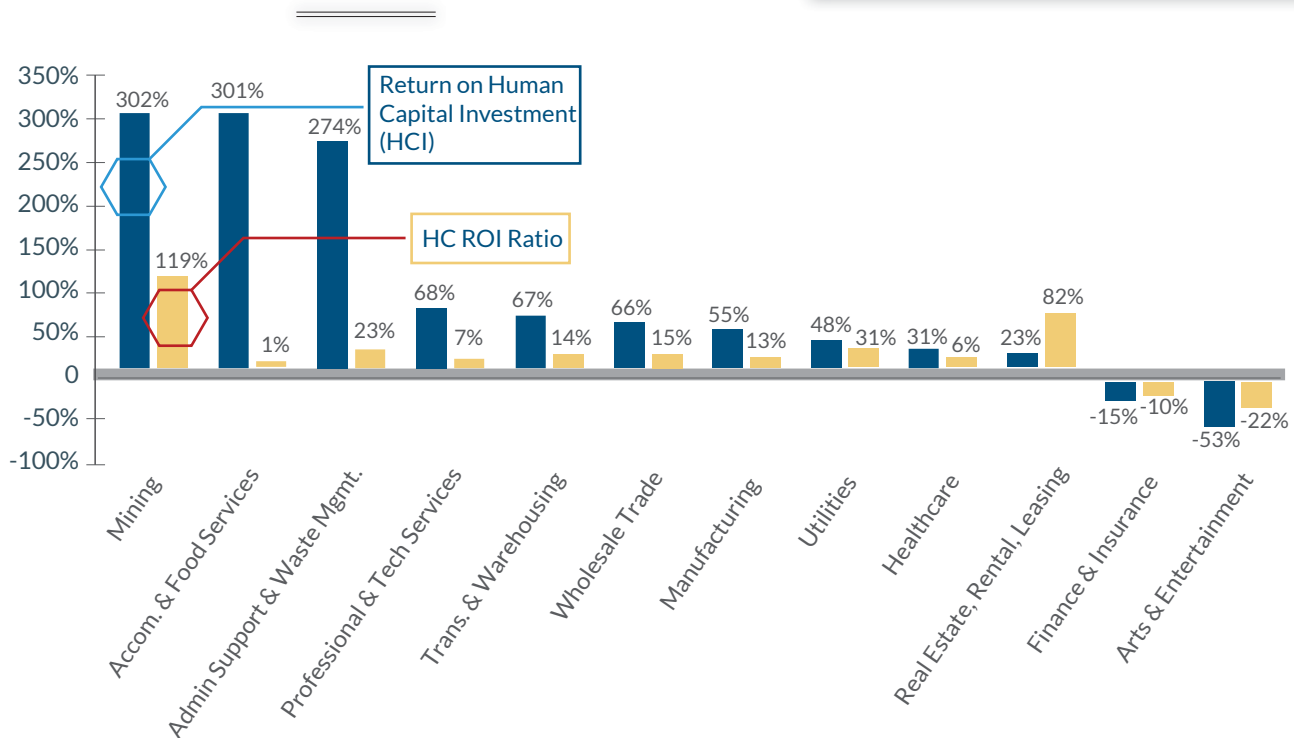
Chart 6 (below) is sorted in descending order on total 16-year percent change in Return on HCI and also on HC ROI Ratio. The reason for this is that **Return on HCI was found across sectors to be the most significant human capital metric used in the study in predicting stock price changes.** Return on HCI is also less subject

to changes in commodity or general product/service pricing changes as it is calculated by dividing net operating profits by Total Cost of Workforce (TCOW).

The following observations and insights were seen in the cross-sector data analysis:

- In low-human-capital-intensity sectors, human capital costs are still significant but are not the largest operating expense (i.e., jet fuel for airlines in Transportation & Warehousing sector).
- In low-human-capital-intensity sectors (i.e., Utilities, Wholesale Trade), high returns are possible on small changes in human capital from automation or technology, but do require larger financial and physical capital investment (i.e., capital equipment, physical product inventory).
- High-intensity service-driven sectors have greater potential to increase productivity (i.e., revenue and profits) without equivalent increases in human capital cost (i.e., Real Estate, Rental & Leasing, Transportation & Warehousing, Wholesale Trade, Finance & Insurance).
- Increased commodity pricing due to global demand, industry deregulation, or other factors can drive large gains in HC ROI Ratio in low-human-capital-intensity sectors (i.e., Mining, Utilities).

Chart 6:
16-Year Change in Human Capital Metrics by Industry



Who are the Real Productivity Winners? Chart 7 shows the sector performance based on percentage change from 1996 to 2011 in conventional metrics Revenue per FTE and Profit per FTE on the vertical axis and the new productivity metrics HC ROI Ratio, Return on HCI, and TCOW on the horizontal axis.

To be classified a “winner”, a sector needed to show significant performance gains in both HC ROI Ratio and Return on HCI as well as in conventional productivity metrics gains Revenue per FTE and Profit per FTE (Chart 7). Significant performance gains are defined as gains in specific metrics that exceed the 16-year inflation adjusted growth rate (47.8% U.S. inflation from 1996 to 2011 for this study). In addition, each sector was also evaluated on its overall change in TCOW % of Revenue and TCOW % of Operating Expense as an evaluation of true effectiveness in workforce cost management, innovation, automation, and productivity gain that truly impacts company bottom line. Certain sectors significantly reduced TCOW % of Revenue and Operating Expenses such as Administrative Support & Waste Management Services, Transportation & Warehousing, Wholesale Trade, Mining, and Utilities.

“Surprise winner” sectors showed median change in performance in HC ROI Ratio and/or Return on HCI above the inflation adjusted growth rate and significantly improved in TCOW % of Revenue and TCOW % of Operating Expense even as performance gains in conventional productivity metrics Revenue per FTE and Profit per FTE may have been less strong.

“Loser” sectors showed performance gains in the conventional productivity metrics Revenue per FTE and Profit per FTE, but showed little improvement in HC ROI Ratio, Return on HCI, and TCOW.

“False winner” sectors showed large performance gains in the conventional productivity metrics Revenue per FTE and Profit per FTE, but showed little improvement in productivity using HC ROI Ratio, Return on HCI, and TCOW. In the case of Professional & Technical Services, Return on HCI did improve 68.0%; however, HC ROI Ratio gains were negligible and both TCOW % of Revenue and Operating Expense negatively impacted productivity from 1996 to 2011 (increasing 8.7% and 11.9% respectively).

Chart 7:
Productivity Changes by Sector



IV. Industry Focus

Data specific to 12 unique industry sectors were included in the analysis, however, two sectors; Finance & Insurance and Transportation & Warehousing, were chosen for a deeper analysis based on the depth of public company data available as well as the relative human capital intensity of these two sectors.

The remaining sections of the study will focus on Finance & Insurance and Transportation & Warehousing sectors in two ways. First, in this section, each sector is broken down into its respective major industry groups and is then evaluated using the same metrics and modeling methodologies that were applied to the large sector analysis. This analysis highlights the substantial differences and emerging trends that can exist between different industries, within industries and geographies, all the way down to individual company performance.

The contributions of HC metrics to stock prices changes for three different views of HC metrics are then presented. The three views show the differences between the contributions of HC metrics when average industry values are assessed. The positive view highlights the contributions of high positive HC metrics. The negative view examines the contributions of negative HC metrics on stock price changes. As shown average HC metrics contribute little to explaining stock price changes while high positive and negative HC metrics have significant effects on stock price changes. HC metrics do matter.

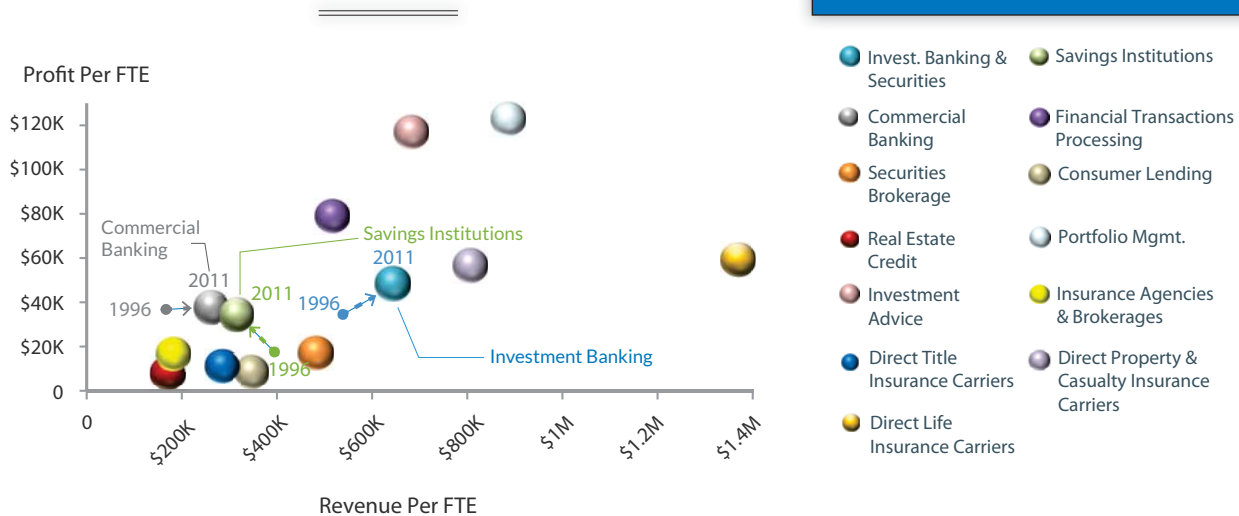
Section VII includes individual company case study examples representing both broader trends already highlighted in the sector and industry analysis but also in terms of unique company changes and issues.

Finance & Insurance Sector

This sector had median Revenue per FTE gains of 40% (\$225,234 to \$314,403), and Profit per FTE gains of 35% (\$120,300 to \$187,000 Chart 4). While this may seem like solid industry productivity gains delivering higher revenues and profits for each full-time equivalent (FTE) worker that is not the reality. The reason is that while headcount was controlled or reduced over the analysis period, workforce costs were not. Both productivity metrics HC ROI Ratio and Return on HCI declined (-10%, -15% respectively) over the study period (Chart 5).

Breaking the Finance & Insurance sector into separate industry groups by conventional productivity metrics Revenue per FTE and Profit per FTE (Chart 8A), we can see stars such as Direct Life Insurance Carriers, Sales Financing& Investment Banking and Securities Dealing.

Chart 8A:
2011 Revenue & Profit per FTE (Finance & Insurance)

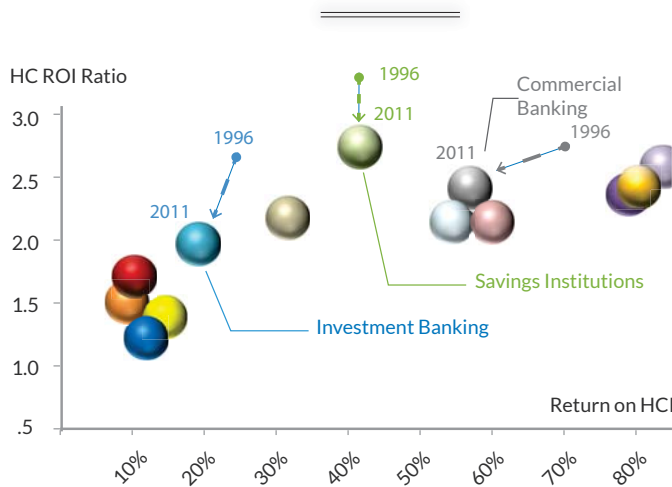


Direct Life Insurance Carriers shows top 2011 Revenue per FTE of \$1.37 million, but Portfolio Management, Investment Advice, & Financial Transactions Processing are higher in Profit per FTE. In Chart 8A, the top industry is Portfolio Management with Profit per FTE of \$123,000 and Revenue per FTE of \$886,000.

From 1996 to 2011, most of the industries in Finance & Insurance improved in Revenue per FTE (12 of 13 industries) and Profit per FTE (10 of 13 industries). Focusing on three industries, Commercial Banking, Savings Institutions, and Investment Banking, we see gains for all three in Profit per FTE, but mixed results in Revenue per FTE gains (see Chart 8A) as Savings Institutions lost -19% from \$389,000 to \$314,000.

In Chart 8B (below), the story is of falling productivity as eight of 13 industries declined in HC ROI Ratio and seven of 13 in Return on HCI. Commercial Banking, Savings Institutions and Investment Banking fell -11%, -14%, -29% respectively in HC ROI Ratio from 1996 to 2011. The same three industries also struggled or lost -10%, 1% and -19% in Return on HCI respectively. Overall, the top performer in HC ROI

Ratio and Return on HCI was Direct Property & Casualty Insurance Carriers, one of only three industries improving in all six human capital metrics over the study period. The other two were Financial Transactions Processing and Portfolio Management.



Did widely touted investments in technology and off shoring fail to deliver expected productivity gains? While there have been significant labor headcount reductions, particularly since the 2008 financial crises, equivalent cost reductions do not seem to have materialized. In fact, the HC ROI Ratio and Return on HCI metrics, which measure return on one dollar invested in the workforce, illustrate that workforce costs have increased relative to revenue, profit, and total expenses.

In analyzing Finance & Insurance sector trends from 1996 to 2011 (Charts 9A, 9B), Revenue per FTE showed the most significant gains from 2004 to 2007, peaking at \$401,644 per FTE in 2007, after years of strong global economic growth and low interest rates. But by 2007, Profit per FTE was already declining having peaked in 2006 at \$53,332 per FTE. Looking at the trend, the impact of the global financial crises can be clearly seen in both charts with Revenue per FTE and Profit per FTE having recovered to pre-crisis levels while the new cost/profit-linked metrics HC ROI Ratio and Return on HCI have not. Both of the metrics in Chart 9B actually peaked in 2005 on a sector-wide level supporting the conclusion that HC ROI Ratio and Return on HCI are both sensitive leading indicators of true workforce productivity. Finance & Insurance had a median \$2.64 in HC ROI Ratio in 1996, falling to \$2.37 in 2011.

Chart 8B:
HC Ratio & Return on HCI (Finance & Insurance)

- Invest. Banking & Securities
- Commercial Banking
- Securities Brokerage
- Real Estate Credit
- Investment Advice
- Direct Title Insurance Carriers
- Direct Life Insurance Carriers
- Savings Institutions
- Financial Transactions Processing
- Consumer Lending
- Portfolio Mgmt.
- Insurance Agencies & Brokerages
- Direct Property & Casualty Insurance Carriers

Chart 9A:
Finance & Insurance (Headcount Productivity)

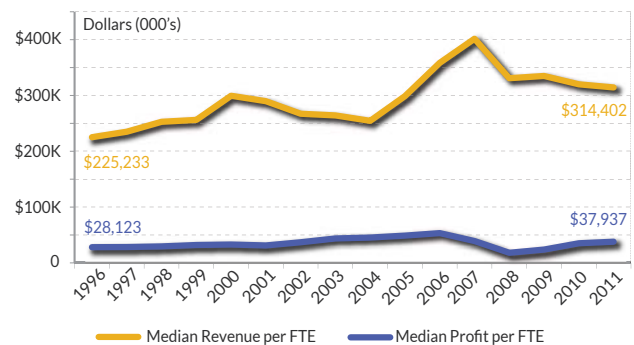


Chart 9B:
Finance & Insurance (Cost/Profit
Productivity)

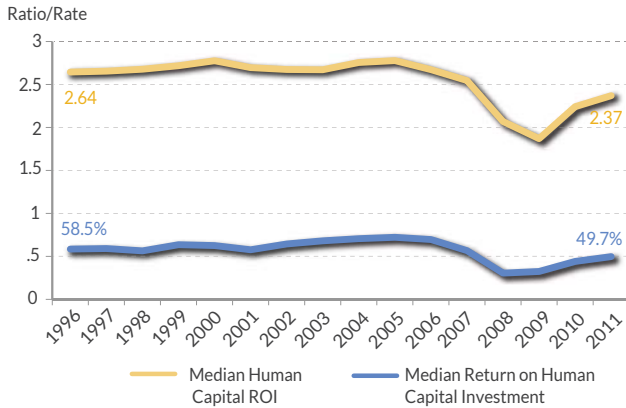


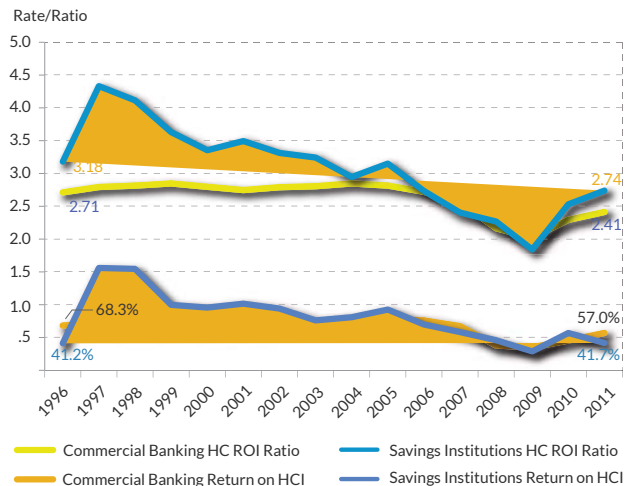
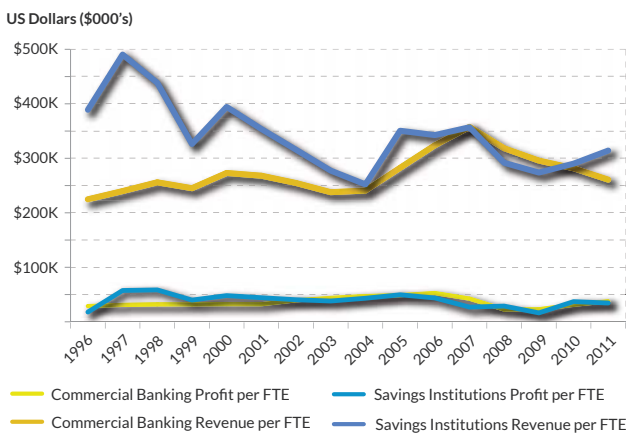
Chart 10A (below) shows Commercial Banking trending up in Revenue per FTE and Profit per FTE while Savings Institutions Revenue per FTE has trended down since 1996. Chart 10B (below) shows generally negative trends for both industries in HC ROI Ratio and Return on HCI even with unusually low 1996 base year results.

If 1997 was used as a base year, Commercial Banking and Savings Institutions lost -13.6%, -36.8% in HC ROI Ratio and -20.2%, -73.3% in Return on HCI respectively in the new productivity metrics since 1996.

Human Capital Metrics and Contributions to Stock Price Changes

Three different snap shots of the contributions of HC metrics to stock price movements are highlighted in this section. An “Average Human Capital (HC) Metrics” case uses mean values for the HC metrics and the other seven variables. The “Positive HC Metrics” case uses the maximum values of the three HC metrics in the period from 1996 to 2011 and the means of the other seven variables. The “Negative HC Metrics” case uses the minimum values for HC metrics in the period from 1996 to 2011 and the mean values for the other seven variables.

**Chart 10A (below left) &
10B (right):**
Commercial Banking & Savings Inst.



Interpretations of the results are provided. The outcomes show that HC initiatives that drive movements in HC metrics can have a wide range of effects on stock price gains/losses. The contributions are diverse and differ by industry. While two industries are analyzed as cases in this white paper, all twelve industries studied will be examined in a follow-up industry profile series.

Finance & Insurance – Modeling Industry Stock Price Changes (3 Scenarios)

The Finance and Insurance sector was also modeled to project/predict stock price impacts due to human capital (HC) metrics changes in three different economic scenarios (Chart 11). When comparing the diversity of movements in the selected HC metrics and stock prices in this industry to those found in the Transportation and Warehousing industry, it quickly becomes clear that the swings can be up to 10 times larger. The highs and lows are not only numerically larger, but the average case even shows some movement.

As shown in Chart 11, scenario #1 “Average HC Metrics”, shows the combined HC metrics contribution is 11.83% on a base stock price gain of 1.56%. This means that the HC metrics contribute 0.18% of the stock price changes. The “Positive HC Metrics case finds that when HC metrics are the highest seen in the industry, the three HC metrics explain 94.16% of the 246.5% estimated stock price change. Comparing this to the “Negative HC Metrics” view where the three HC metrics explain 92.87% of a -199.43% decrease in stock prices it is clear that HC metrics do matter at the extremes observed in this industry. At the individual HC metric level, HC ROI is the leading contributor to stock price changes in the Average and Positive views. Return on HC Investment was the largest contributor in the Negative View.

Chart 11 shows three views of human capital metric contributions in the Finance & Insurance sector.

Moving to the “Positive HC Metrics” case the individual HC metrics contribute from 18.38% (TCOW) to 40.62% in HC ROI Ratio (HC ROI). This means in average economic times actions which lead to maximum HC values are associated with a stock price increase of over 200% (232.10%). Upside movements in this industry are not surprising and can be associated with “come backs” from “bubbles bursting”. The best known crisis was the Global Financial Crisis (GFC) which will receive greater focus in a special section in the forthcoming Finance & Insurance company cases section.

Chart 11:
Finance & Insurance - Three Industry Views

	#1 Average	#2 Positive	#3 Negative
HC ROI	7.93%	40.62%	6.42%
Return on HCI	.95%	35.16%	66.43%
TCOW	2.95%	18.38%	20.02%
SUM	11.83%	94.16%	92.87%
PRCC	1.56%	246.5%	-199.43%
Expl PRCC	.18%	232.1%	-185.21%

Chart 11 Notes:

Shows percentage stock price changes by human capital (HC) metric in 3 scenarios:

- 1 - Average economic conditions
- 2 - Positive economic conditions
- 3 - Negative economic conditions

HC ROI - Human Capital ROI Ratio
Return on HCI - Return on Human Capital Investment
TCOW - Total Cost of Workforce
SUM - HC Metric contribution to predicted stock price change
PRCC - Total predicted stock price change from all variables
Expl PRCC - % of stock price change explained by HC metrics

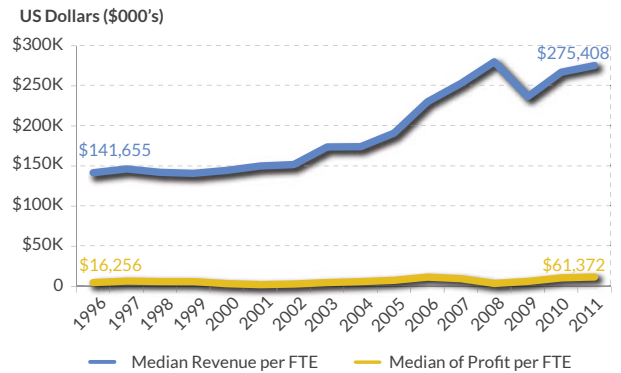
Where big positive movements are present from HC metrics in the positive scenario, HC metrics also contribute strongly to substantial stock price downside in the negative HC metrics scenario. For the Finance & Insurance industry, the combined HC metrics contributed 92.87% to the negative scenario period stock price loss. The industry model's worst case view of stock price loss was -199.43% and the HC metrics contributed -185.21% of the change. This result is an extreme case of a company in average economic conditions taking the most drastic measures found among companies in this industry and period. Interestingly, Return on HCI is the largest contributor to stock price losses followed by TCOW and HC ROI Ratio in the negative scenario.

The results of these scenarios support further assessment and examination. By themselves, they show that HC metrics can be significant contributors to business performance in extreme conditions. The "Why" and "What" detailed actions contributing to extreme changes in HC metrics requires more detailed data and will be analyzed by HCMI in an upcoming survey and industry profile series.

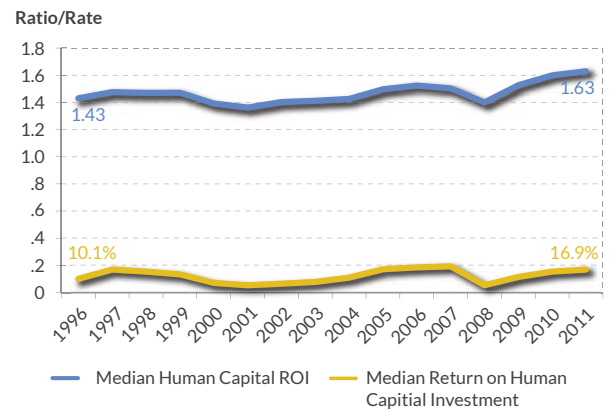
Transportation & Warehousing Sector

- Transportation and Warehousing was a surprising winner improving significantly in all human capital metrics studied. A median firm in this sector successfully achieved 94.4% and 153.6% increases in Revenue per FTE and Profit per FTE respectively and productivity gains of 13.9% in HC ROI Ratio and 67.5% in Return on HCI (charts 12A, 12B).
- The sector does not appear to have seen significantly increased pricing like other industries. Note, Train Transportation did see large price increases, but overall seems to have successfully improved productivity through effective workforce cost control (TCOW).
- In 1996, \$1.00 invested in labor costs returned a median \$1.43 in HC ROI Ratio and 10.1% in Return on HCI. By 2011, that return grew to 1.60 in HC ROI Ratio and 93% in Return on HCI (charts 12A, 12B).

**Chart 12A;
Headcount Productivity**



**Chart 12B:
Workforce/Cost Productivity**



The Transportation & Warehousing sector consists of approximately eighteen separate industries, many of which lacked sufficient data for more in-depth analysis. Many industries within this sector are made up of privately held small-to-medium-sized businesses while others had inconsistent, incorrect, or missing workforce data for analysis. However, four industries with a critical mass of large (greater than 1000 employees) companies had consistent publicly reported workforce data to match financial results and stock price changes. The four industries include Airlines, Railroads, General Trucking, and Couriers & Express Delivery Services. These industries are highlighted in Charts 13A, 13B, 14A, 14B.

Railroads was the top-performing industry in 2011 in Revenue per FTE (\$374,000) and Profit per FTE (\$61,000) improving 106% and 159% respectively in each metric from 1996 to 2011 (Chart 13A, 13B). In terms of total percentage improvement, Couriers & Express Delivery Services improved the most, gaining 130% in Revenue per FTE and 236% in Profit per FTE over the study period.

Railroads was by far the most productive industry in HC ROI Ratio (2.50 in 2011) and Return on HCI (\$66.7% in 2011) for all years studied, improving 28% and 69% respectively in each metric (Chart 14A, 14B).

Chart 13A
Revenue per FTE (top right)
&
Chart 13B
Profit per FTE (center right)

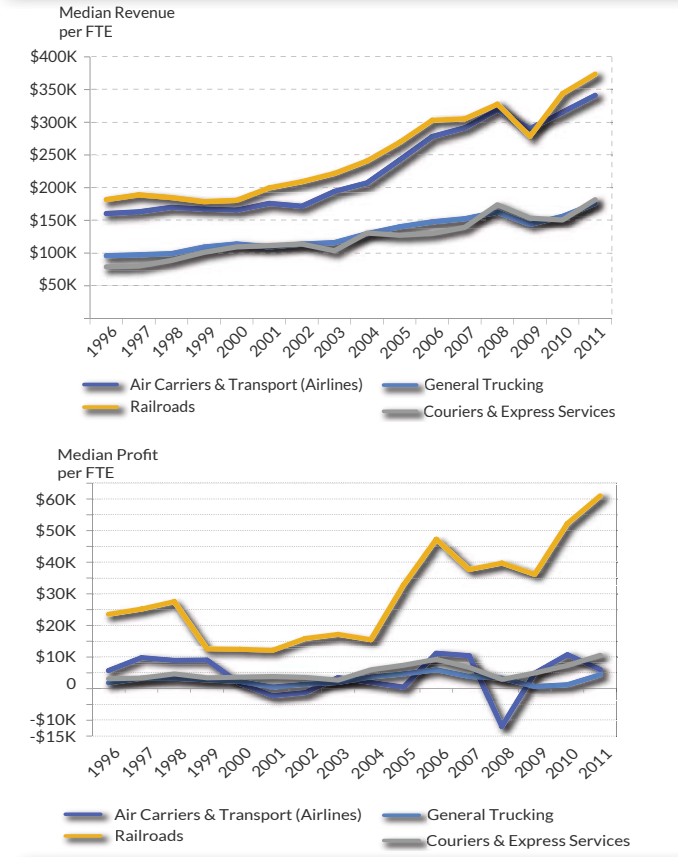
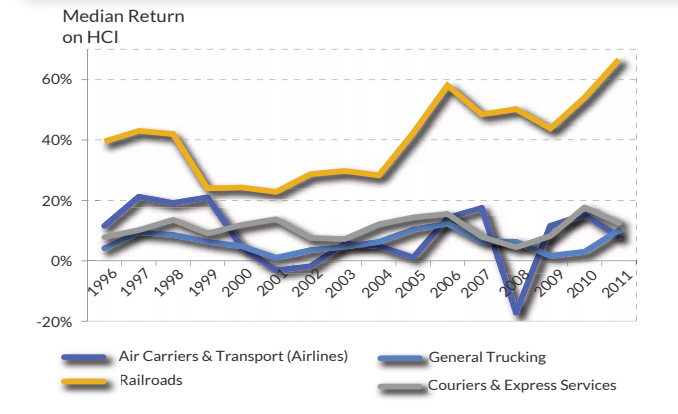
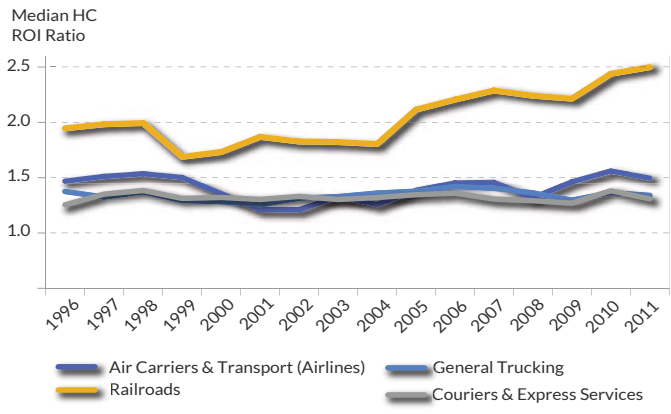


Chart 14A:
Revenue per FTE (bottom left)
&
Chart 14B:
Profit per FTE (bottom right)



**Chart 15:
Transportation & Warehouse: Three
Industry Views**

	#1 Average	#2 Positive	#3 Negative
HC ROI	.59%	53.87%	12.25%
Return on HCI	1.31%	21.09%	52.58%
TCOW	.51%	11.54%	16.84%
SUM	2.41%	86.5%	81.67%
PRCC	-1.63%	169.19%	-119.92
Expl PRCC	-.04	146.35%	-97.94%

Chart 15 Notes:

Shows percentage stock price changes by human capital (HC) metric in 3 scenarios:

- 1 - Average economic conditions
- 2 - Positive economic conditions
- 3 - Negative economic conditions

HC ROI - Human Capital ROI Ratio

Return on HCI - Return on Human Capital Investment

TCOW - Total Cost of Workforce

SUM - HC Metric contribution to predicted stock price change

PRCC - Total predicted stock price change from all variables

Expl PRCC - % of stock price change explained by HC metrics

Transportation and Warehousing – Modeling Industry Stock Price Changes (3 Scenarios)

As shown in Chart 15, the movement of HC metrics has a diverse effect on stock price gains/losses. In average conditions (scenario #1), the sum of the mean values of all three HC metric contributions for a one-year scenario period is approximately 2.41% of an average change in stock price of -1.63%. This means that in a year with average economic conditions, small movements in HC metrics does not have a substantial effect on stock prices. In previous studies, such results could be interpreted as meaning that HC initiatives had no effect on business performance, but those interpretations are incorrect.

Looking inside this case, the movements of HC metrics are: HC ROI Ratio 0.95%, Return on HCI -3.21%, and TCOW -0.57% and the movement in stock price is -1.63%. So the “Average HC Metrics” case is based on little or no HC movements in a period where overall stock price movement is also small. This case might be described as a stable or stagnant business period.

Contrast this outcome with the Positive HC or Negative HC views (scenarios 2 and 3). In these cases there is substantial HC metric movement and stock price movement. The “Positive HC Metrics” (scenario 2) case for Transportation and Warehousing shows that the three HC metrics contribute almost 8.65% to a stock price movement of 169.19%. Of the three HC metrics, the HC ROI Ratio measure contributes over half the stock price gains. The other HC metrics - Return on HCI and TCOW - contribute 21.09% and 11.54% to stock price changes respectively. Comparing this to the first view shows that putting substantial HC initiatives in place that change key HC metrics yields large stock price gains. Given the limitations of current data sources, deeper analysis of “what” these initiatives may be is not possible. It should also be noted that these results are adjusted based on the overall explanatory power (i.e., R-squared) of the industry model regression.

In the third view (scenario 3), the movements of HC metrics are negative (i.e. lowest recorded in the industry). The results showcase the consequences of initiatives that negatively affect HC metrics and their impact on stock prices. One explanation economists may give for such connections is the concept of signaling and investor response. Specifically, if decreasing HC is a sign to investors that the pattern

of future changes in shareholder value will be less, investors would sell shares and prices would fall. While this is one explanation, many others exist that deserve further attention.

In the “Negative HC Metrics” view (3) the combined effects of substantial drops in HC metrics are found to contribute 81.67% of stock price losses. The estimated stock price losses in such an environment are -119.9%. Please note that this result is an extreme case of a company in average economic conditions taking the most drastic measures found among companies in this industry and period. The resulting amount of the combined stock price losses associated with the three HC metrics is -98%. Among the three HC metrics, 52.6% of the 81.7% combined HC metric contributions come from Return on HCI. Also in this case, HC ROI Ratio contributes 12.6% and TCOW contributes approximately 16.8% to the stock price losses.

A critical industry question examined for both Finance & Insurance and Transportation & Warehousing is – do movements in HC metrics predict or contribute to stock price gains/losses? The results showed that it varies considerably on the level of HC initiatives and economic conditions. In relatively stable years when HC metric changes are small, the contributions are minimal. In periods when positive changes in HC metrics occur, contributions to stock price gains are substantial with the size of the effect varying by industry. Finally, when negative movements in HC metrics occur, stock prices are shown to fall. The contributions of HC metrics to the stock price losses are important in both the upside and downside views. In the period from 1996-2011 dramatic changes in HC metrics and stock prices provide a robust set of experiences, strong industry models, and an appreciation that average changes are of limited value in understanding the true contributions of HC initiatives to measures of business performance such as stock prices.

These two industry cases demonstrate key differences in the contributions that HC initiatives and changing HC metrics can have on stock price movements. There is no general rule that can be called up to predict the size and importance of the connection. Most importantly, there is no basis to conclude that there isn’t a connection between HC metrics and stock price changes. If such an outcome were discovered, it is most likely because the HC metrics are not moving. More complete and detailed industry analyses are planned for all industry sectors in an upcoming HCMI industry profile series.

V. Individual Company Case Studies

Leading companies in the two industry sectors previously highlighted were selected for specific case studies. The industry models calculated for the period from 1996-2011 were then used to examine the relationships between individual company stock price gains/losses and movements in HC metrics. The specific company cases analyzed show movement of HC metrics and stock price changes differ on a year-to-year basis by sector, industry, and company.

In the Finance & Insurance sector, the HC ROI Ratio and Return on HCI HC metrics were the strongest contributors when they moved positively. When HC metrics declined, the Return on HCI measure was the strongest contributor followed by TCOW and HC ROI. However, in the Transportation and Warehousing sector when HC metrics were moving positively HC ROI Ratio had the strongest relationship with stock price gains. When HC metrics were modeled in a negative direction Return on HCI was the main contributor to stock price losses (Chart 15).

A key question going into the company case studies is: will similar relationships be found for HC metrics and stock price gains and losses for a given company in each industry?

In the company cases, two different approaches were taken. For the Finance & Insurance, a comparison was made among Bank of America (stock ticker symbol BAC), HSBC (stock ticker symbol HBC) and Wells Fargo (stock ticker symbol WFC). The volatility and responsiveness of the different banks presented a unique opportunity to study HC metrics and their contributions to movements in stock prices. That unique opportunity was the Global Financial Crisis (GFC), specifically 2008-2010.

For the Transportation and Warehousing sector, two leading airlines, Southwest Airlines and JetBlue Airways were analyzed and compared. Economic conditions were allowed to vary and each company's HC metrics and contributions to stock prices gains/losses were studied. Economic conditions appeared to revolve around inflation, which is a dominant factor in the sector and industry models. Thus, the analyses were done when inflation was the highest and the lowest in the period from 1996 - 2011. This occurred in 2008 (bad) and 2009 (good). In

these years rising prices meant travelers had less to buy airline tickets. As shown, the results add to our understanding of HC metrics and the varying roles that they play for different companies over an economic cycle. The results show that even leading companies react differently based on HC metrics as well as other conditions and events, which mask the true roles of HC metrics and their relationship to stock price movement.

Finance & Insurance Case Study: HSBC vs. Bank of America vs. Wells Fargo

The company case studies presented here focus on the period known as the Global Finance Crisis (GFC). The analysis started in 2008 and extended through 2011. The latter three years are referred to as the “re-balancing period”. As shown, each of the banks had stock price losses in 2008, but by differing degrees, and each had its own recovery path. The HC metrics moved in some years, but not in others. The contributions from HC metrics to stock price movements also varied. In several instances the industry models failed to predict the recorded stock price results. In these cases, research was done to see what factor(s) occurred in those years to the specific companies which were outside the scope of the historical data or industry patterns. In such cases, likely explanations were found and are reported.

Key questions include:

- “Which company had the most workforce productivity from 2008 to 2011?”
- “Was the most productive company rewarded by the marketplace?”

Chart 16A compares BofA (BAC), Wells (WFC) and HSBC (HBC) on Revenue per FTE, Profit per FTE, and TCOW - all on a per FTE basis - showing BAC and WFC as apparent top Revenue per FTE and Profit per FTE performers. HBC seems to lag in Chart 16A, but sustained the largest productivity gains from 2009 to 2011 (Chart 16B). A more compelling picture emerges in Chart 16C, that clearly shows HBC outperforming BAC and WFC in HC ROI Ratio and Return on HCI.

Chart 16A:
2011 Key Performance Indicators (KPIs)

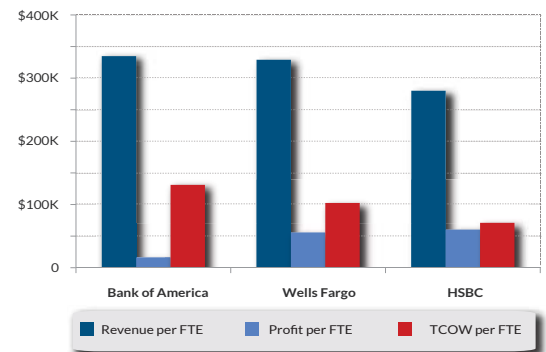


Chart 16B:
2009-2008* Average Annual Change Rate (%)

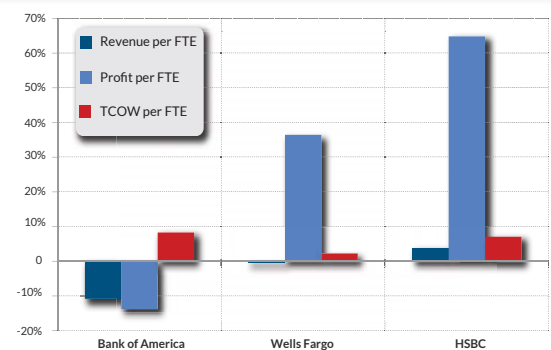


Chart 16C:
2009-2011 Productivity Metric Change Rates

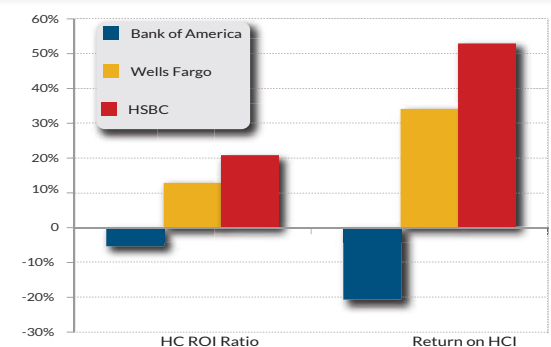


Chart 17:
Individual Company Cases - The Path to
Recovery from the Global Financial Crisis

	GFC Begins 2008	Post GFC 2009	Post GFC 2010
HSBC Holdings (HBC)			
HC ROI	.57%	1.41%	2.5%
Return on HC	4.99%	.38%	3.56%
TCOW	2.66%	17.72%	31.31%
SUM	8.23%	19.51%	37.36%
Model PRCC	-22.16%	-1.22%	16.41%
PRCC	-41.85%	17.3%	-10.59%
Expl PRCC	-3.44%	3.38%	-3.96%

Bank of America (BAC)			
HC ROI	1.39%	.64%	.4%
Return on HC	4.5%	.18%	2.58%
TCOW	5.51%	21.22%	36.92%
SUM	11.4%	22.04%	39.9%
Model PRCC	23.3%	.08%	15.56%
PRCC	-65.87%	6.96%	-11.42%
Expl PRCC	-7.51%	1.53%	-4.56%

Wells Fargo Bank (WFC)			
HC ROI	1.39%	2.01%	.1%
Return on HC	2.77%	1.96%	.11%
TCOW	16.18%	29.39%	27.93%
SUM	20.35%	33.37%	28.14%
Model PRCC	-2.35%	-8.44%	14.82%
PRCC	-25.6%	6.19%	12.85%
Expl PRCC	-5.21%	2.07%	3.62%

The Path to Recovery from the Global Financial Crisis

The GFC hit in 2008 and the recovery has been on-going ever since. The analysis focuses on the three recognized commercial banks previously profiled and how initiatives that moved HC metrics affected stock price gains/losses each year from 2008-2010. As shown, there was no common path to recovery. The most important findings are that movements in HC metrics and their contribution to stock prices were often hidden by bigger corporate issues such as mergers and acquisitions, leadership changes, and repayment of government bailout monies. Key movements of HC metrics that had notable contributions to stock price gains and losses differed by company and year in this period. The application of the Finance & Insurance sector/industry models provided new and previously unseen insights into the role and importance of HC metrics upon company performance. The results are summarized in Chart 17 and analyzed by company below.

HSBC Holdings: (HBC)

In 2008, HBC recorded a stock price loss of 41.85%. The industry model predicted a downturn but at a 22.2% rate. The difference in these values is important. One possible explanation is that other factors not encountered in the period from 1997 to 2007 occurred in this year and HBC was unable to address them quickly enough to avoid additional stock price losses. A second explanation is that HBC took initiatives including HC initiatives that had adverse effects on stock price in 2008 but were intended to improve recovery in 2009 and 2010. Both of these propositions deserve further attention but are not addressed here because they require additional data and discussions with HBC.

The primary HC metric that changed in 2008 was Return on HCI, which decreased by 62% for HBC contributing to a 5.00% decline in stock price. As shown below, reductions in Return on HCI was the norm for banks in 2008. This was an industry pattern. Specifically, when total operating profit decreases more than total workforce cost Return on HCI decreases and stock price also falls.

In 2009, HBC recorded a 17.3% stock price gain. In retrospect it seems possible that the 2008 actions were put in place to accelerate stock price gains in 2009. Indeed the industry estimate for stock price movement was lower (-1.2%) than what was actually achieved in that year (17.3%). In 2009, the primary HC metric contributing to

stock price movements was the change in TCOW. It measured 17.7% to stock price movement. Why HBC chose to go against industry patterns and act such that Return on HCI decreased instead of increased is unclear.

In 2010, HBC's recovery stalled. Its stock price loss was -10.59%. The industry model predicted that the actions of the bank should have been associated with a 16.4% stock price gain. The combined contribution to stock price gains from all three HC metrics was estimated to be 37.36%. The difference between the industry model prediction and the actual HBC results may be due to an initiative not encountered in the period from 1997-2007. A review of events did show that HBC unveiled a new leadership team and structure for commercial banking in 2010. The stated purpose of the reorganization and leadership change was to take forward HBC's position as the world's leading international bank. The two leaders were Stephen Green and Michael Geoghegan. Whether the new leadership can achieve the desired result and return HBC to positive company performance in terms of stock price gains remains to be investigated.

Uncertainty is expected to play an increasing role in HBC's performance. The sources of the systemic uncertainty came from a mix of economic and world uncertainty. Some of these include the euro crisis, the Federal Reserve's struggle to revitalize the housing market, the slow U.S. economic recovery and the potential for a second round of housing foreclosures. At this time is it unknown if this uncertainty is temporary or will be permanent for HBC. But with its focus on global banking the effects of uncertainty could be difficult for HBC to overcome.

Bank of America: BAC

Similar to HBC, BAC's stock price plunged in 2008. The -65.78 % stock price loss was the highest of the three banks studied. Once again the industry model predicted a decline in stock price based on movements in HC metrics and economic conditions (-23.30%), but not at the level shown. Two potential factors which could explain the discrepancy predicted the industry prediction and the key factor for the discrepancy were the mounting losses at Merrill Lynch in 2008 and was fighting a securities fraud case across the year. The importance of each factor and others require additional data which HCMI is seeking to collect.

In 2009, BAC's stock price gained 6.96% which was similar in pattern to HBC. The pattern of improvement was predicted, but slightly underestimated by the industry model (0.08%). Changes in TCOW combined to explain 21.22% of the stock price change predicted by the industry model. This period of relative stability in HC initiatives was followed by a 2010 period with more activity.

Specifically in 2010, BAC stock price fell 11.4%. The industry model predicted a continued rise in stock price from 2009 (15.56%), which was not accurate. Upon further examination we learned that the elephant in the room for BAC was the pending write down of losses from its 2008 Countrywide Financial acquisition. This loss was partly realized in 2010 and countered strengthening banking results.

The 2008-2010 pattern that emerges for both HBC and BAC seems to be one of recovery offset by major shocks to their performance. In such periods the effects of HC initiatives on HC metrics and their contributions to stock price changes can run counter to overall industry experience. In other words, they were swamped by other GFC incidents that changed the banking industry.

Wells Fargo Bank: WFC

The third banking institution studied was Wells Fargo Bank (WFC). In 2008, WFC stock prices fell -2.35%. The industry model predicted a larger stock price loss of -25.60% which is very likely explained by WFC's acquisition of Wachovia in that year. TCOW contributed 16.18% of the industry prediction with the integration of revenue, cost and HC outcomes from WFC and Wachovia. Compared to HBC's stock price loss (42.0%) and BAC's stock price loss (65.87%), WFC with a -2.4% decrease weathered the GFC better than other companies analyzed.

Unlike the other banks studied, WFC did not show a rebound in stock prices in 2009. In fact, its 2009 stock price loss (-8.4%) was larger than its 2008 stock price loss (-2.4%). TCOW contributed 29.4% to the industry prediction of 6.2%. But the predicted gain did not account for two events. Specifically, WFC raised \$12.2 billion dollars in equity to repay its federal bailout debt and managed a complex banking merger in 2009. These actions seem to have had a negative effect on WFC stock prices.

Chart 18A:
2011 Key Performance Indicators (KPIs)

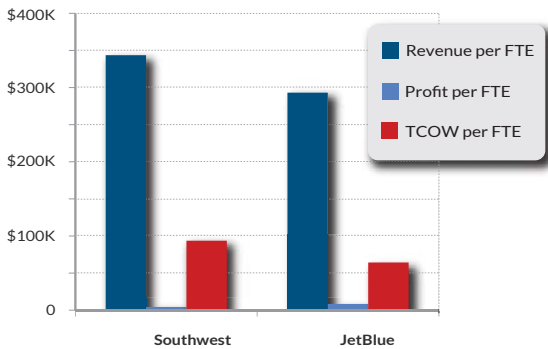


Chart 18B:
2009-2011 Average Annual Rate of Change

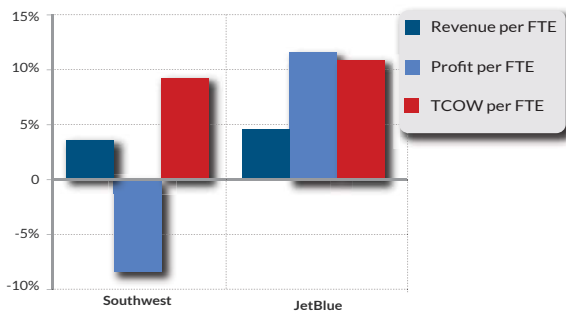


Chart 18C:
2009-2011 Productivity Metric Change Rates



On still another level, the actions taken in 2009 that moved HC metrics in that year (the positive movements of Return on HCI and HC ROI Ratio) may have helped set the stage for a 14.8% WFC stock price gain in 2010. On the HC side, TCOW continued to lead the way contributing 27.9% to a highly accurate prediction of 12.9% stock price gain from the model. Warren Buffet invested heavily in WFC and encouraged others to do so as well. Unlike some years, in 2010 WFC HC metrics and economic conditions predicted the stock price outcomes that it achieved.

With continuing uncertainty in international money markets associated with the euro crisis, the U.S. debt crisis, the inability of the U.S. Congress to act on meaningful tax or spending proposals, and the Federal Reserve's large scale asset purchases, the connections between HC metrics and stock price changes remain unstable. When recovery does fully happen in the housing market (barring some other crisis), WFC could be an early mover to positive stock price gains compared to other banks like HSBC and BAC.

Transportation & Warehousing Case Study: JetBlue Airways vs. Southwest Airlines

Charts 18A, 18B compare JetBlue Airways (NASDAQ stock ticker symbol JBLU) and Southwest Airlines (NYSE stock ticker symbol LUV) in 2011 on productivity relative to revenue, profit, and workforce cost per FTE. In Chart 18A, LUV is higher in both Revenue per FTE (a positive) and TCOW per FTE (a negative) yielding a mixed performance. In Chart 18B, JBLU is improving both Revenue per FTE and Profit per FTE at a higher average rate than LUV but also has TCOW per FTE increasing at a higher rate than LUV, perhaps due to growth but generally not a good thing for a low-cost airline.

Chart 18C shows the rate of productivity change from 2009 through 2011 using 2008, a bad year for both companies, as a base year for comparison. JBLU, according to Chart 18C, outgained LUV in cost-based workforce productivity, averaging 9.8% in HC ROI Ratio and 7.5% in Return on HCI improvement annually over three years.

Company Case: Southwest vs. JetBlue, Economy Effects on HC Metrics and Stock Price

The Transportation and Warehousing sector includes major airlines. Two airlines, Southwest Airlines (LUV) and JetBlue Airways (JBLU) are studied as company cases. A distinguishing feature of this sector is its susceptibility to macroeconomic cycles. As the Transportation

and Warehousing model shows, inflation has a major effect on stock price results. As shown, macroeconomic cyclical effects can have dramatically different effects on stock price movements. Overall, Return on HCI, HC ROI Ratio, and TCOW are positively related to stock price movements.

Looking deeper into the connection between inflation and stock price changes the average inflation level was 3.54% in the period and its contribution to average stock price change was 44.27%. Thus, it was chosen as the preferred macroeconomic measure (over GDP and unemployment measures) to use in this study model. The lowest level of inflation (which would be associated with the least effect on stock prices) was -0.32% in 2009. The highest inflation (bad economic conditions) was 3.8% in 2008. The HC metrics and stock price gains/losses for LUV and JBLU for 2008 and 2009 are presented below. The results were truly surprising because they revealed how different the two recognized companies are. While LUV meets or exceeds industry stock price standards and has generally been reducing HC metrics, JBLU had declining HC metrics in 2008 when inflation was low and rising HC metrics in 2009 when inflation was at its highest in the period studied. The reasons found for these differences remind us that the contributions of HC to stock price movements are part of a bigger set of company strategies. And the effects of changing HC metrics on stock price gains/losses can run counter to the industry/market results. Key predictive model information is shown in Chart 19 and discussed below.

Southwest Airlines: LUV

In 2008, inflation was high and for the transportation industry in general this meant stock price losses. Coupled with the Global Financial Crises (GFC), the downward pressure on stock prices was significant. LUV was representative of the industry. The recorded stock price loss was -29.3%. That was slightly worse than the industry model prediction of -24.9%. The increase in inflation (3.8%) reduced the purchasing power of potential leisure travelers. With less real income, fewer airline tickets may have been purchased by leisure travelers. The GFC also slowed down business travel. At LUV all three HC metrics declined. For LUV, Return on HCI dropped -14.7% and contributed 3.3% to the stock price decline. HC ROI Ratio fell -7.7% and contributed 2.6% to the stock price loss. Finally, TCOW also declined, -4.32% and contributed 3.97% to a stock price loss.

Chart 19:
Individual Company Cases - The Path to Recovery from the Global Financial Crisis

	View #1 Low Inflation	View #2 High Inflation
Southwest Airlines		
HC ROI	1.64%	2.57%
Return on HCI	.79%	3.25%
TCOW	4.46%	3.97%
SUM	6.89%	9.79%
Model PRCC	14.85%	-24.92%
PRCC	32.5%	-29.3%
Expl PRCC	2.24%	-2.87%
Jet Blue		
HC ROI	5.58%	1.99%
Return on HCI	5.33%	3.02%
TCOW	6.0%	3.11%
SUM	16.91%	8.12%
Model PRCC	21.15%	-25%
PRCC	-23%	20.90%
Expl PRCC	-3.89%	1.7%

In the following year (2009), the level of inflation fell to -0.32%. A slightly deflationary period emerged in the post-GFC period. LUV recorded a stock price gain of 32.6% versus the industry model prediction of a 14.9% rise. The difference may be attributed to several LUV programs. First, LUV distinguished itself from other airlines in 2009 by keeping prices affordable when oil prices soared. They could do this because of their oil futures contracts that locked in prices. LUV also decided not to attach fees for such things as soft drinks, snacks and checked luggage. As a result, the airline was rewarded by travelers as being the number one airline in 2009. In that year, two of the three HC metrics changes had negative effects on stock prices. TCOW increased by 3.35% which contributed 4.46% to the predicted stock price gains. HC ROI Ratio and Return on HCI both decreased and contributed to a -2.43% stock price loss. From a strategic perspective LUV could be implementing HC initiatives from a tactical perspective just as it does fuel management. But such hypotheses require more data and information than are currently available.

Jet Blue: JBLU

JBLU presents a different story than LUV. JBLU recorded a +20.3% stock price gain in 2008 (bad economy) and a -23.0% stock price loss in 2009 (good economy). In 2008 the HC metrics for JBLU were very similar to LUV and the combined contributions were a positive 8.1% to stock prices. Decreased TCOW contributed 3.11% to stock price gains while declines in Return on HCI and HC ROI Ratio contributed 5.0% to stock price losses. Additional research revealed that the difference from industry practices occurred at a time when JBLU expanded in the Orlando area and opened its New York Terminal T5 hub. The route expansions that followed in 2009 may have led to distinctly different stock price movements relative to the industry.

JBLU's stock price fell -23.0% in a year with good economic conditions for the industry. The industry model predicted a 21.1% stock price gain in that year. Again, the addition of the international routes from Orlando and the ramp-up in hub activity in New York ran counter to cutbacks from most other airlines. With the expansion of routes in this period, all three HC metrics increased. HC ROI Ratio increased 13.0% and contributed 5.6% to stock price while Return on HCI increased 18.8% and contributed 5.3% to stock prices. Even with the 5.0% increase in TCOW with its associated positive stock price effect, the combined effects of HC metric changes were overwhelmed by

other negative stock price factors. Further research indicated that one possible factor was an increase in fuel prices that increased costs over \$42 million in the fourth quarter alone. With expansion and rising fuel prices, stock prices fell. In an effort to right itself in 2010, JBLU took the bold step of raising prices \$10 each way on each of its routes. It had not raised prices since its inception in 2002.

As we have demonstrated, those organizations that have the best performance on their human capital metrics also demonstrate strong financial performance based on typical measures like Return on Equity, Share Price Appreciation, etc. Investors and analysts looking for additional data points to evaluate a company and its prospects may want to consider human capital metrics as well.

A Call to Action, the Need For Deeper Human Capital Data

What is less clear and merits further investigation is whether a causal relationship exists and, if so, which direction the causality runs. In other words, do organizations that manage their human capital enjoy better financial results or do financially successful organizations have the resources and management acumen to also successfully manage their workforces?

More broadly, and perhaps more importantly, there exists the need to deconstruct the profit or loss that an organization shows on its income to capture the portion of that figure that is attributable to the human capital. If a firm brings to bear some combination of property, plant, and equipment; intellectual property; intangibles; capital; and human capital to earn money for its shareholders, what percentage of that can be attributed to human capital? And how elastic is that contribution? If a firm earns \$1.50 for every dollar invested into the workforce, will additional dollars invested produce the same rate of return? Furthermore, at what point will these returns begin to diminish? On the other hand, is it possible to get a greater rate of return on the next dollar invested into the workforce instead? Obviously there is an optimal level the challenge is to empirically quantify what that level is. This will be the subject of future research.

Don't Miss Out!

Want a better look at your Workforce data? Take part in our Human Capital Survey!

Our one-of-a-kind survey will give you access to some of the most valuable metrics and benchmarks for **your** specific industry!

The survey is free & easy-to-use. Don't miss your chance to benchmark your company and obtain essential workforce productivity metrics!

Visit hcmInst.com for more info.

VI. Challenges & Next Steps

This white paper has presented snapshots of some key findings about human capital metrics and the contributions human capital makes to improved business performance. While much clearly remains to be done, the limitation of existing data remains the most relevant challenge to overcome to learn more and show the true value of human capital to businesses.

However, due to limitations in available data, human capital analytics is still early in the anticipated path of exploration, meaning we have only begun to scratch the surface of the linkages and implications human capital has on company past, present and future performance.

Next Step - Benchmarking Organizational Workforce Productivity

As a follow up to this white paper, HCMI is launching a web-based survey tool enabling organizations to obtain their own workforce productivity metrics and benchmark themselves against industry peers. You can get more information on the benchmark survey by visiting us [online at hcmInst.com](http://online.at/hcmInst.com).

Our goal is to increase awareness about the issues raised around the importance and predictive power of human capital data. In addition, we also strive to develop improved workforce data and reporting practices to better manage human capital in all economic conditions. We hope you will join HCMI and Professor Don Atwater of Pepperdine University in discussing and furthering the significant opportunities that the human capital metrics identified in this paper have clearly revealed.



Human Capital Management Institute
14003 Palawan Way, Suite 210
Marina Del Rey, CA 90292
www.hcminst.com



Please reply to
Joseph Morrissey
joseph.morrissey@hcminst.com

About Human Capital Management Institute

The Human Capital Management Institute (HCMI) was founded on the belief that organizations can, and must, find better ways of measuring their investments in human capital. Our goal is to help organizations transform workforce data into a source of value that drives fact-based decision making, workforce measurement, planning, and analytic modeling. HCMI leads and educates organizations on what to measure, what it means, how it fits and how to improve it. While many organizations state people are their most valuable asset, few have the tools to assess, manage and optimize their workforce.



**Jeff Higgins -
Human Capital Management
Institute, CEO**

Jeff is a driving force in Human Capital analytics advancements among Global 2000 & Fortune 500 companies. Using his unique experience as both a senior HR executive and a former CFO, Jeff has helped many companies advance in analytics & workforce planning.



**Dr. Donald Atwater, PhD -
Pepperdine University**

Dr. Atwater has been a faculty member at Pepperdine since 1995. Each year he teaches five or more managerial economics, macroeconomics, and international business courses in the BSM and MBA programs.



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Harish Reddy Sida, Jody Gilmyers, Magdalena Tucker, Grant Cooperstein, Maria Luisa Noguera, Matthew Lemert and Bill Gilmyers

APPENDIX A: Definitions of Human Capital Metrics

Human Capital ROI Ratio

- **Formula:** $(\text{Total Operating Revenue} - (\text{Total Expenses} - \text{Total Cost of Workforce})) / \text{Total Cost of Workforce}$
- **Description:** Net operating profit impact of each dollar invested in human capital or the total cost of workforce. NOTE: It is recommended that the metric Total Cost of Workforce, which includes the total costs of employees plus all contingent headcount (contract and temporary workers), be used in calculating Human Capital ROI Ratio. If Total Cost of Workforce detailed information is not available, this metric may also be calculated using the total costs of employees as an alternate.

Profit per FTE

- **Formula:** $\text{Total Net Operating Profit} / \text{Average Employee FTE or Average Workforce FTE}$
- **Description:** Net operating profit generated for each full-time equivalent employee (FTE) as well as workforce FTE which includes employees, temporary workers and contractors.

Return on Human Capital Investment

- **Formula:** $\text{Total Operating Profit} / \text{Total Cost of Workforce}$
- **Description:** Return on investment in terms of net operating profit, expressed as a percentage of the total dollar amount invested in human capital workforce costs.

Revenue per FTE

- **Formula:** $\text{Total Net Revenue} / \text{Average Employee FTE or Average Workforce FTE}$
- **Description:** Average amount of net revenue generated for each full-time equivalent employee (FTE) as measured either for all employee FTE or total workforce FTE which includes employees, temporary workers and contractors.

Total Cost of Workforce (TCOW) Percent of Revenue

- **Formula:** $(\text{Total Compensation Costs} + \text{Benefits Costs} + \text{HR Costs} + \text{Other Workforce Costs}) / \text{Total Revenue}$
- **Description:** Total cost of the workforce (TCOW) expressed as a percentage of total operating revenue. The workforce is defined as employees plus contingent (contract and temporary) workers. Total cost of workforce is defined as the total costs of all salaries, wages direct and indirect cash or equity compensation for all employees. TCOW includes all costs for contingent temporary or contract workers whenever the organization primarily directs the work of such labor. For example, offshore employees who work in a separate legal entity that is 50% or greater controlled by the organization should be included in the total cost of workforce. TCOW includes all company provided or paid employee benefits, perks and rewards. Such costs also include all company retirement-related costs for both current and former employees. TCOW includes all enterprise HR costs such as training costs provided to employees and contingent labor, all recruiting costs not already included incurred as workforce acquisition costs, all employee relations, severance and legal settlements paid to current and former employees or contingent labor.

(Continued on next page...)

APPENDIX A: Definitions of Human Capital Metrics (Continued...)

Total Cost of Workforce (TCOW) Percent of Operating Expenses

- **Formula:** $(\text{Total Compensation Costs} + \text{Benefits Costs} + \text{Other Workforce Costs}) / \text{Total Operating Expenses}$
 - **Description:** Total cost of the workforce expressed as a percentage of total operating expenses. The workforce is defined as employees plus contingent (contract and temporary) workers. Total cost of workforce is defined as the total costs of all salaries, wages direct and indirect cash or equity compensation for all employees. TCOW includes all costs for contingent temporary or contract workers whenever the organization primarily directs the work of such labor. For example, offshore employees who work in a separate legal entity that is 50% or greater controlled by the organization should be included in the total cost of workforce. TCOW includes all company-provided or paid employee benefits, perks and rewards. Such costs also include all company retirement-related costs for both current and former employees. TCOW includes all enterprise HR costs such as training costs provided to employees and or contingent labor. All recruiting costs not already included incurred as workforce acquisition costs. All employee relations, severance and legal settlements paid to current and former employees or contingent labor.
-

APPENDIX B: Descriptions of other metrics used in the Analysis

Actual Rate of Unemployment: The unemployment rate represents the number of unemployed as a percentage of the labor force. Labor force data are restricted to people 16 years of age and older, who currently reside in 1 of the 50 states or the District of Columbia, who do not reside in institutions (e.g., penal and mental facilities, homes for the aged), and who are not on active duty in the Armed Forces.

Source: Economic Research, Federal Reserve Bank of St. Louis

Bank Prime Loan Rate: Rate posted by a majority of top 25 (by assets in domestic offices) insured U.S.-chartered commercial banks. Prime is one of several base rates used by banks to price short-term business loans

Source: Economic Research, Federal Reserve Bank of St. Louis

Consumer Price Index: Is the changes in the prices paid by urban consumers for a representative basket of goods and services

Source: Economic Research, Federal Reserve Bank of St. Louis

Industrial Production Index: An economic indicator that is released monthly by the Federal Reserve Board. The indicator measures the amount of output from the manufacturing, mining, electric and gas industries

Source: Economic Research, Federal Reserve Bank of St. Louis

Natural Rate of Unemployment: The natural rate of unemployment (NAIRU) is the rate of unemployment arising from all sources except fluctuations in aggregate demand. Estimates of potential GDP are based on the long-term natural rate. The U.S. Congressional Budget Office (CBO) did not make explicit adjustments to the short-term natural rate for structural factors before the recent downturn.) The short-term natural rate incorporates structural factors that are temporarily boosting the natural rate beginning in 2008. The short-term natural rate is used to gauge the amount of current and projected slack in labor markets, which is a key input into CBO's projections of inflation

Source: Economic Research, Federal Reserve Bank of St. Louis

Net Income: This item represents the income or loss reported by a company after expenses and losses have been subtracted from all revenues and gains for the fiscal period including extraordinary items and discontinued operations. This item, for banks, includes securities gains and losses.

Source: WRDS Database

Producer Price Index: the average change over time in the selling prices received by domestic producers for their output. The prices included in the PPI are from the first commercial transaction for many products and some services
Source: Economic Research, Federal Reserve Bank of St. Louis

(Continued on next page...)

APPENDIX B: Descriptions of other metrics used in the Analysis (Continued...)

Real Gross Domestic Product: Real gross domestic product is the inflation adjusted value of the goods and services produced by labor and property located in the United States.

Source: Economic Research, Federal Reserve Bank of St. Louis

S&P 500 Stock Price Index: The index includes 500 leading companies in leading industries of the U.S. economy, which are publicly held on either the NYSE or NASDAQ, and covers 75% of U.S. equities.

Source: Economic Research, Federal Reserve Bank of St. Louis



Appendix C: NAICS Business Sector Information

Sector	Size (Total # of U.S. companies)	Partial NAICS Description	Top 5 Sub-Sectors (in descending order by size)
Accommodation & Food Services	654,017	"The Accommodation and Food Services sector comprises establishments providing customers with lodging and/or preparing meals, snacks, and beverages for immediate consumption. The sector includes both accommodation and food services establishments because the two activities are often combined at the same establishment. Excluded from this sector are civic and social organizations; amusement and recreation parks; theaters; and other recreation or entertainment facilities providing food and beverage services."	<ol style="list-style-type: none"> 1. Full-Service Restaurants 2. Limited-Service Restaurants 3. Hotels (except Casino Hotels) and Motels 4. Drinking Places (Alcoholic Beverages) 5. Caterers
Administrative Support & Waste Management / Remediation Services	1,142,973	"The Administrative and Support and Waste Management and Remediation Services sector comprises establishments performing routine support activities for the day-to-day operations of other organizations. These essential activities are often undertaken in-house by establishments in many sectors of the economy. The establishments in this sector specialize in one or more of these support activities and provide these services to clients in a variety of industries and, in some cases, to households. Activities performed include: office administration, hiring and placing of personnel, document preparation and similar clerical services, solicitation, collection, security and surveillance services, cleaning, and waste disposal services."	<ol style="list-style-type: none"> 1. All Other Business Support Services 2. Landscaping Services 3. Janitorial Services 4. Office Administrative Services 5. Other Services to Buildings and Dwellings.
Arts & Entertainment	290,976	"The Arts, Entertainment, and Recreation sector includes a wide range of establishments that operate facilities or provide services to meet varied cultural, entertainment, and recreational interests of their patrons. This sector comprises (1) establishments that are involved in producing, promoting, or participating in live performances, events, or exhibits intended for public viewing; (2) establishments that preserve and exhibit objects and sites of historical, cultural, or educational interest; and (3) establishments that operate facilities or provide services that enable patrons to participate in recreational activities or pursue amusement, hobby, and leisure-time interests. Some establishments that provide cultural, entertainment, or recreational facilities and services are classified in other sectors."	<ol style="list-style-type: none"> 1. Fitness and Recreational Sports Centers 2. Other Performing Arts Companies 3. Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures 4. Independent Artists, Writers, and Performers 5. Museums
Finance & Insurance	607,795	"The Finance and Insurance sector comprises establishments primarily engaged in financial transactions (transactions involving the creation, liquidation, or change in ownership of financial assets) and/or in facilitating financial transactions. Three principal types of activities are identified: 1. Raising funds by taking deposits and/or issuing securities and, in the process, incurring liabilities. Establishments engaged in this activity use raised funds to acquire financial assets by making loans and/or purchasing securities. Putting themselves at risk, they channel funds from lenders to borrowers and transform or repackage the funds with respect to maturity, scale, and risk. This activity is known as financial intermediation. 2. Pooling of risk by underwriting insurance and annuities. Establishments engaged in this activity collect fees, insurance premiums, or annuity considerations; build up reserves; invest those reserves; and make contractual payments. Fees are based on the expected incidence of the insured risk and the expected return on investment. 3. Providing specialized services facilitating or supporting financial intermediation, insurance, and employee benefit programs. In addition, monetary authorities charged with monetary control are included in this sector."	<ol style="list-style-type: none"> 1. Insurance Agencies and Brokerages 2. Miscellaneous Intermediation 3. Commercial Banking 4. Investment Advice 5. Other Activities Related to Credit Intermediation

Appendix C: NAICS Business Sector Information (Continued...)

Sector	Size (Total # of U.S. companies)	Partial NAICS Description	Top 5 Sub-Sectors (in descending order by size)
Health Care & Social Assistance	1,172,862	"The Health Care and Social Assistance sector comprises establishments providing health care and social assistance for individuals. The sector includes both health care and social assistance because it is sometimes difficult to distinguish between the boundaries of these two activities. The industries in this sector are arranged on a continuum starting with those establishments providing medical care exclusively, continuing with those providing health care and social assistance, and finally finishing with those providing only social assistance. The services provided by establishments in this sector are delivered by trained professionals. All industries in the sector share this commonality of process, namely, labor inputs of health practitioners or social workers with the requisite expertise. Many of the industries in the sector are defined based on the educational degree held by the practitioners included in the industry."	<ol style="list-style-type: none"> 1. Offices of Physicians (except Mental Health Specialists) 2. Child Day Care Services, 3. Offices of Dentists 4. Other Individual and Family Services 5. All Other Miscellaneous Ambulatory Health Care Services
Manufacturing	639,802	"The Manufacturing sector comprises establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. The assembling of component parts of manufactured products is considered manufacturing, except in cases where the activity is appropriately classified in Sector 23, Construction. Establishments in the Manufacturing sector are often described as plants, factories, or mills and characteristically use power-driven machines and materials-handling equipment. However, establishments that transform materials or substances into new products by hand or in the worker's home and those engaged in selling to the general public products made on the same premises from which they are sold, such as bakeries, candy stores, and custom tailors, may also be included in this sector. Manufacturing establishments may process materials or may contract with other establishments to process their materials for them. Both types of establishments are included in manufacturing."	<ol style="list-style-type: none"> 1. Commercial Lithographic Printing 2. All Other Miscellaneous Manufacturing 3. Machine Shops 4. Sign Manufacturing 5. Retail Bakeries
Mining	30,000	"The Mining sector comprises establishments that extract naturally occurring mineral solids, such as coal and ores; liquid minerals, such as crude petroleum; and gases, such as natural gas. The term mining is used in the broad sense to include quarrying, well operations, beneficiating (e.g., crushing, screening, washing, and flotation), and other preparation customarily performed at the mine site, or as a part of mining activity. The Mining sector distinguishes two basic activities: mine operation and mining support activities."	<ol style="list-style-type: none"> 1. Support Activities for Oil and Gas Operations 2. Crude Petroleum and Natural Gas Extraction 3. Drilling Oil and Gas Wells 4. Construction, sand, Gravel Mining 5. Crushed & Broken Limestone Mining and Quarrying
Professional, Scientific, & Technical Services	3,682,218	"The Professional, Scientific, and Technical Services sector comprises establishments that specialize in performing professional, scientific, and technical activities for others. These activities require a high degree of expertise and training. The establishments in this sector specialize according to expertise and provide these services to clients in a variety of industries and, in some cases, to households. Activities performed include: legal advice and representation; accounting, bookkeeping, and payroll services; architectural, engineering, and specialized design services; computer services; consulting services; research services; advertising services; photographic services; translation and interpretation services; veterinary services; and other professional, scientific, and technical services."	<ol style="list-style-type: none"> 1. All Other Professional, Scientific, and Technical Services 2. Offices of Lawyers 3. Other Management Consulting Services 4. Administrative Management and General Management Consulting Services 5. Engineering Services

Appendix C: NAICS Business Sector Information (Continued...)

Sector	Size (Total # of U.S. companies)	Partial NAICS Description	Top 5 Sub-Sectors (in descending order by size)
Real Estate, Rental, & Leasing	692,527	"The Real Estate and Rental and Leasing sector comprises establishments primarily engaged in renting, leasing, or otherwise allowing the use of tangible or intangible assets, and establishments providing related services. The major portion of this sector comprises establishments that rent, lease, or otherwise allow the use of their own assets by others. The assets may be tangible, as is the case of real estate and equipment, or intangible, as is the case with patents and trademarks. This sector also includes establishments primarily engaged in managing real estate for others, selling, renting and/or buying real estate for others, and appraising real estate."	<ol style="list-style-type: none"> Offices of Real Estate Agents and Brokers Lessors of Nonresidential Buildings (except Mini-warehouses) Lessors of Residential Buildings and Dwellings Lessors of Other Real Estate Property Other Commercial and Industrial Machinery and Equipment Rental and Leasing
Retail Trade	1,759,455	"The Retail Trade sector comprises establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The retailing process is the final step in the distribution of merchandise; retailers are, therefore, organized to sell merchandise in small quantities to the general public. This sector comprises two main types of retailers: store and non-store retailers."	<ol style="list-style-type: none"> All Other Miscellaneous Store Retailers (except Tobacco Stores) Supermarkets and Other Grocery (except Convenience) Stores Gift, Novelty, and Souvenir Stores Women's Clothing Stores Other Gasoline Stations
Transportation & Warehousing	409,355	"The Transportation and Warehousing sector includes industries providing transportation of passengers and cargo, warehousing and storage for goods, scenic and sightseeing transportation, and support activities related to modes of transportation. Establishments in these industries use transportation equipment or transportation related facilities as a productive asset. The type of equipment depends on the mode of transportation. The modes of transportation are air, rail, water, road, and pipeline. The Transportation and Warehousing sector distinguishes three basic types of activities: subsectors for each mode of transportation, a subsector for warehousing and storage, and a subsector for establishments providing support activities for transportation."	<ol style="list-style-type: none"> General Freight Trucking, Local All Other Support Activities for Transportation General Freight Trucking, Long-Distance, Truckload Postal Service Freight Transportation Arrangement
Utilities	28,128	"The Utilities sector comprises establishments engaged in the provision of the following utility services: electric power, natural gas, steam supply, water supply, and sewage removal. Within this sector, the specific activities associated with the utility services provided vary by utility: electric power includes generation, transmission, and distribution; natural gas includes distribution; steam supply includes provision and/or distribution; water supply includes treatment and distribution; and sewage removal includes collection, treatment, and disposal of waste through sewer systems and sewage treatment facilities."	<ol style="list-style-type: none"> Water Supply and Irrigation Systems Other Electric Power Generation Natural Gas Distribution Sewage Treatment Facilities Electric Power Distribution

Appendix C: NAICS Business Sector Information (Continued...)

Sector	Size (Total # of U.S. companies)	Partial NAICS Description	Top 5 Sub-Sectors (in descending order by size)
Wholesale Trade	726,617	<p>"The Wholesale Trade sector comprises establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The merchandise described in this sector includes the outputs of agriculture, mining, manufacturing, and certain information industries, such as publishing.</p> <p>The wholesaling process is an intermediate step in the distribution of merchandise. Wholesalers are organized to sell or arrange the purchase or sale of (a) goods for resale (i.e., goods sold to other wholesalers or retailers), (b) capital or durable non-consumer goods, and (c) raw and intermediate materials and supplies used in production."</p>	<ol style="list-style-type: none"> 1. Other Miscellaneous Nondurable Goods Merchant Wholesalers 2. Industrial Machinery & Equipment Merchant Wholesalers 3. Other Miscellaneous Durable Goods Merchant Wholesalers 4. Motor Vehicle Supplies & New Parts Merchant Wholesalers 5. Other Grocery and Related Products Merchant Wholesalers