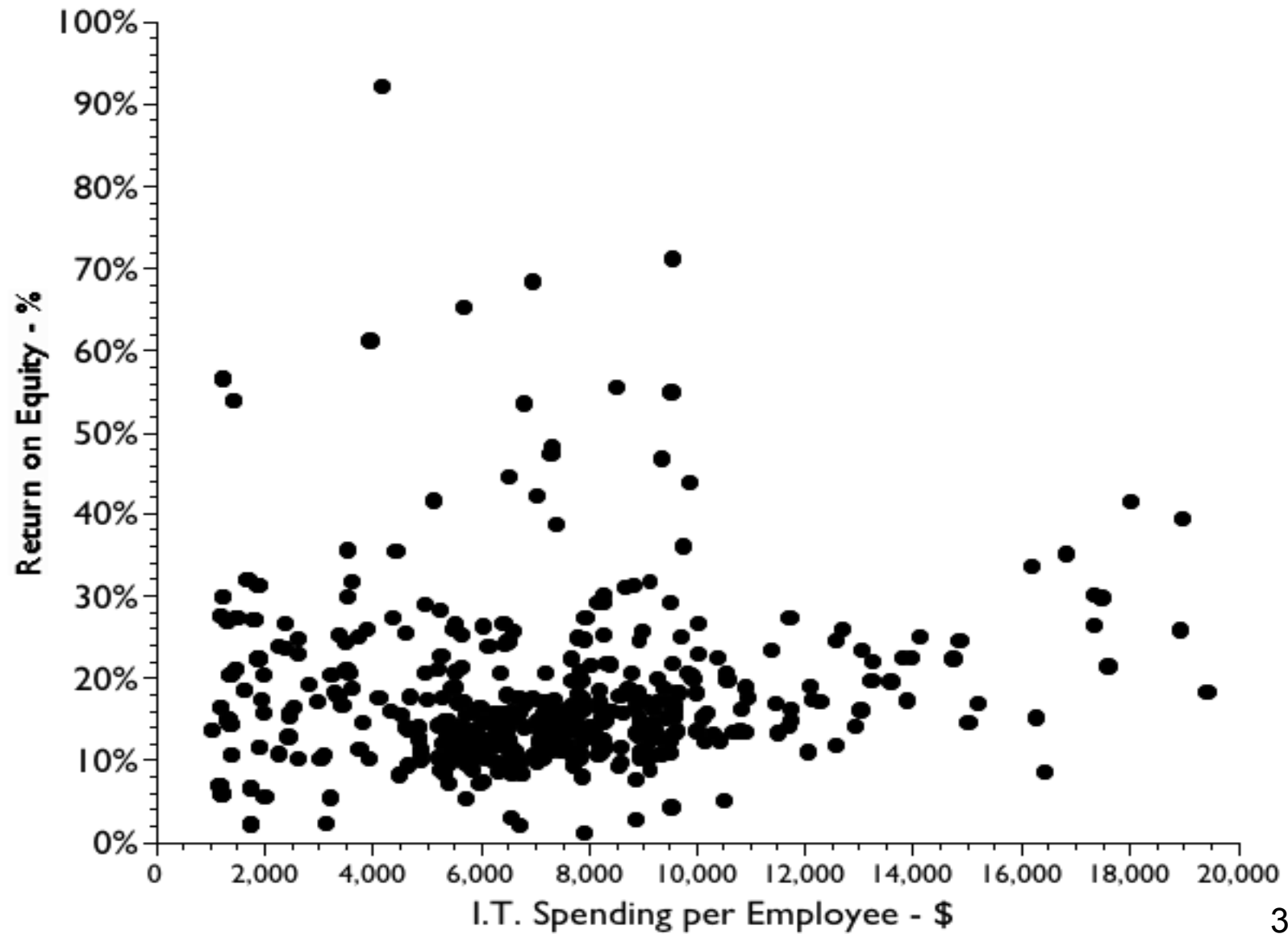


Measuring and Communicating I.T. Value

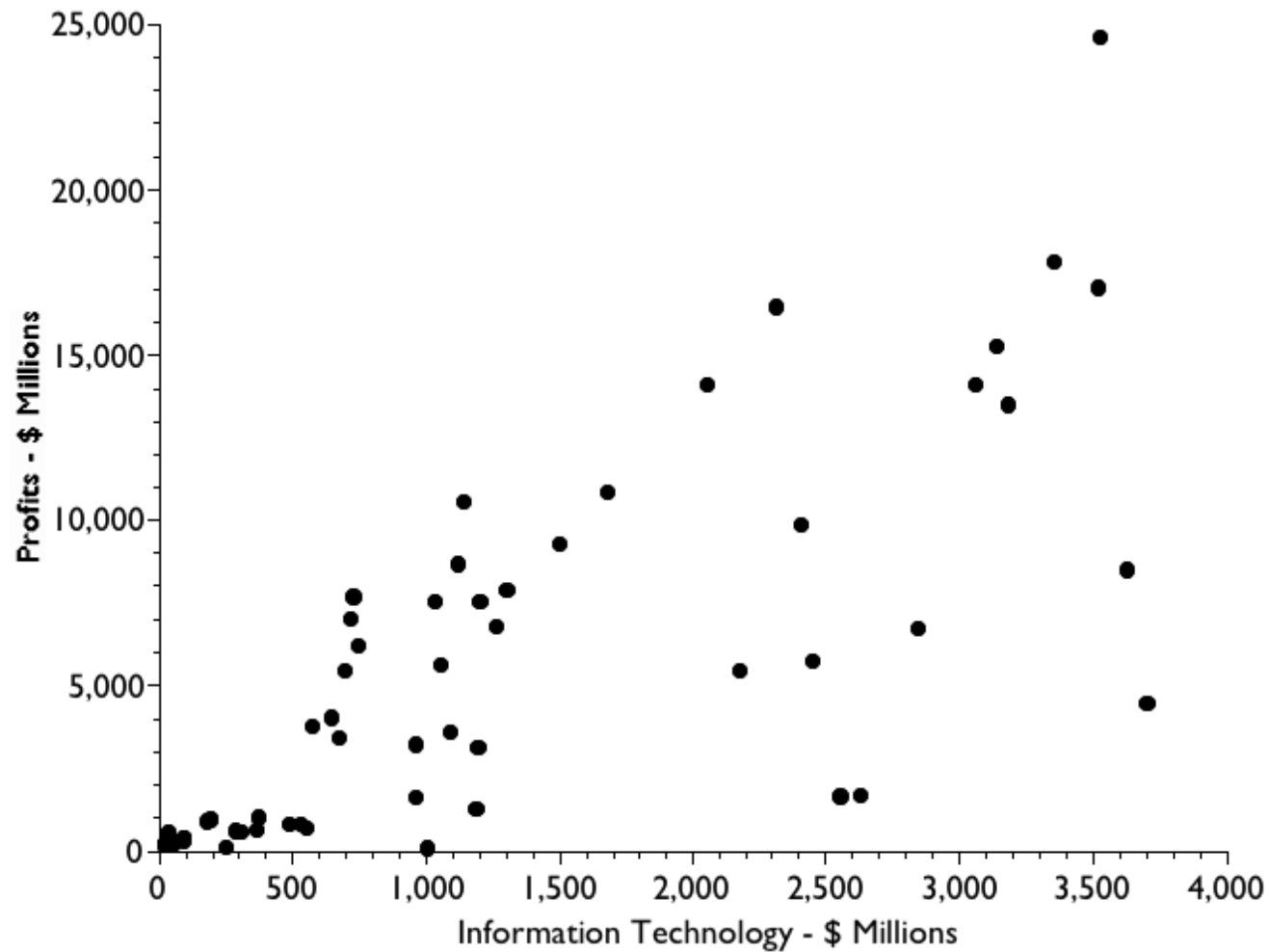
Prof. Paul A. Strassmann
George Mason University, June 21, 2007

Information Technology and Profits

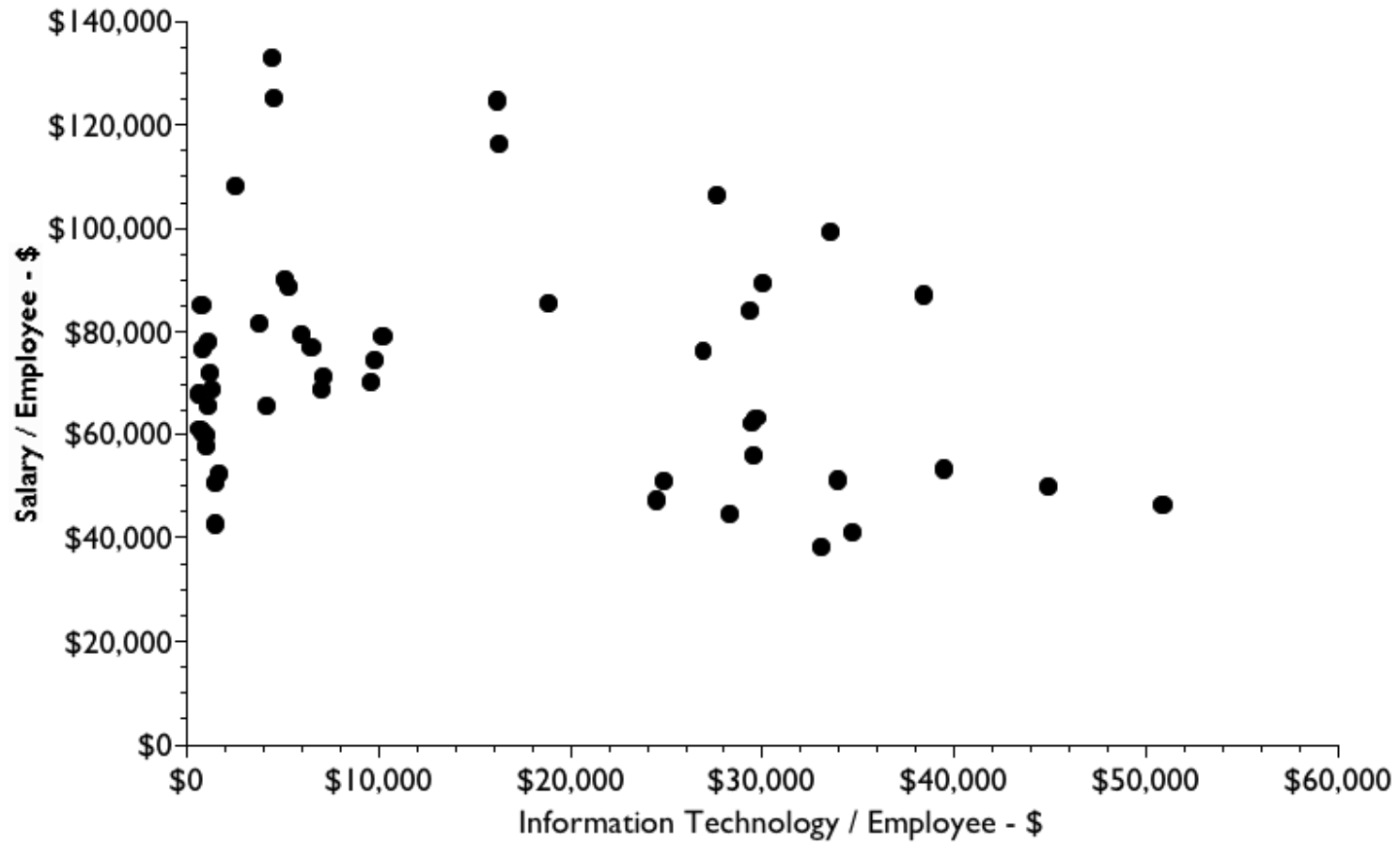
No Correlation Between I.T. and Profitability



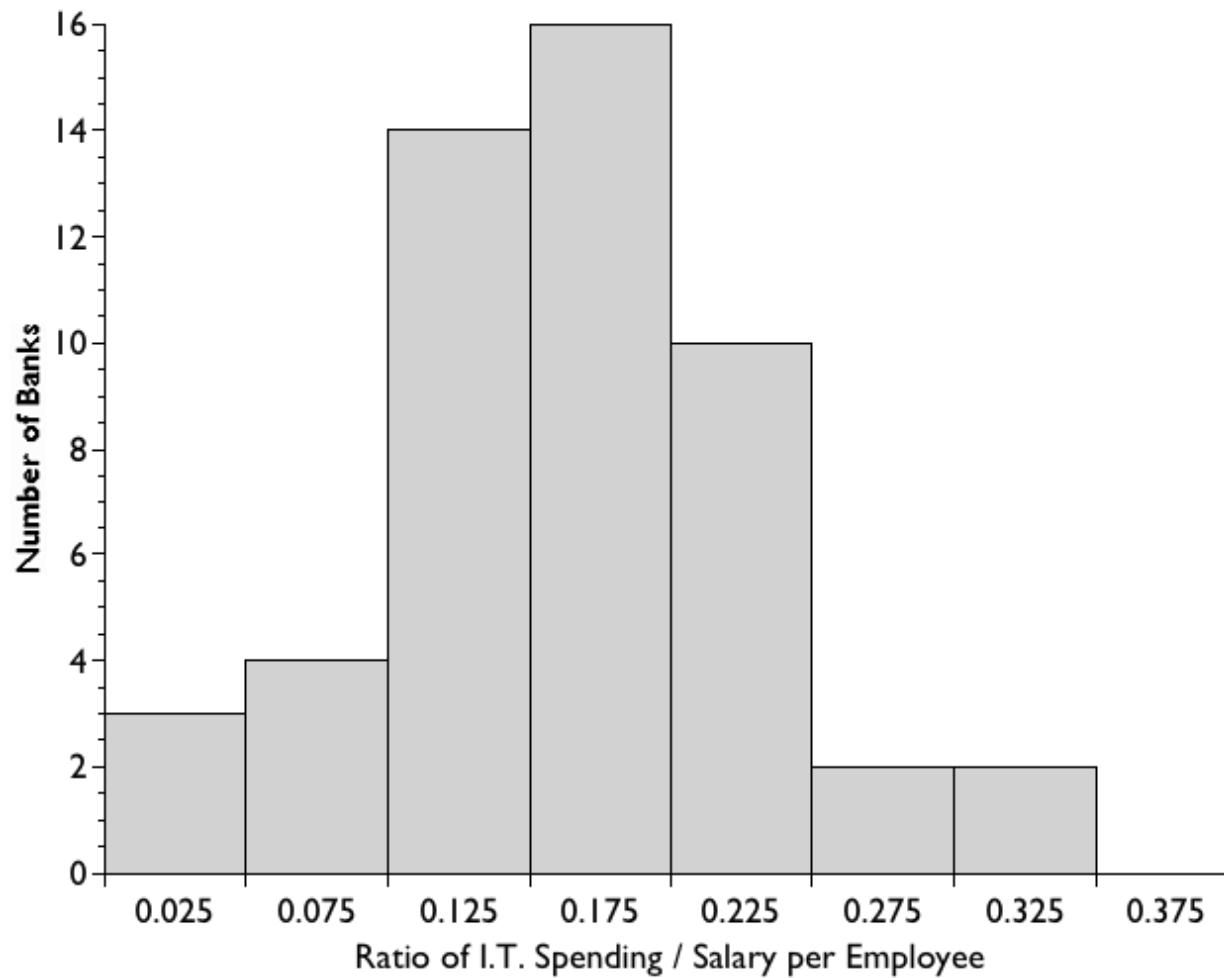
Information Technology and Profits in Banking



I.T. and Salaries are Unrelated in Banking



I.T. Accounts for a Large Share of Salaries in Banking



Benchmarking I.T. Spending

Median Values - 1999 to 2005	IT / Employee - \$	Compensation / Employee - \$	Return on Shareholder Equity - %
Bank of America, Citicorp, Wachovia, Wells Fargo	\$12,729	\$55,057	15.79
Major Bank	\$28,297	\$110,702	9.45

Benchmarking I.T. Costs

I.T. Costs	\$ Millions
Proposed I.T. Budget	\$60.5
Benchmark I.T. Spending	\$57.6
Proposed - Benchmark Spending Difference	\$2.9
Proposed / Benchmark Excess	5.04%

Benchmark I.T. Spending = Constant + VariableA * SG&A +
+VariableB * Number of Personal Computers +
+VariableC * Number of Professional Employees +
+VariableD * Number of Office Clerical Employees +
-VariableE * Number of Executive and Managerial Employees +
+VariableF * Profit after Taxes

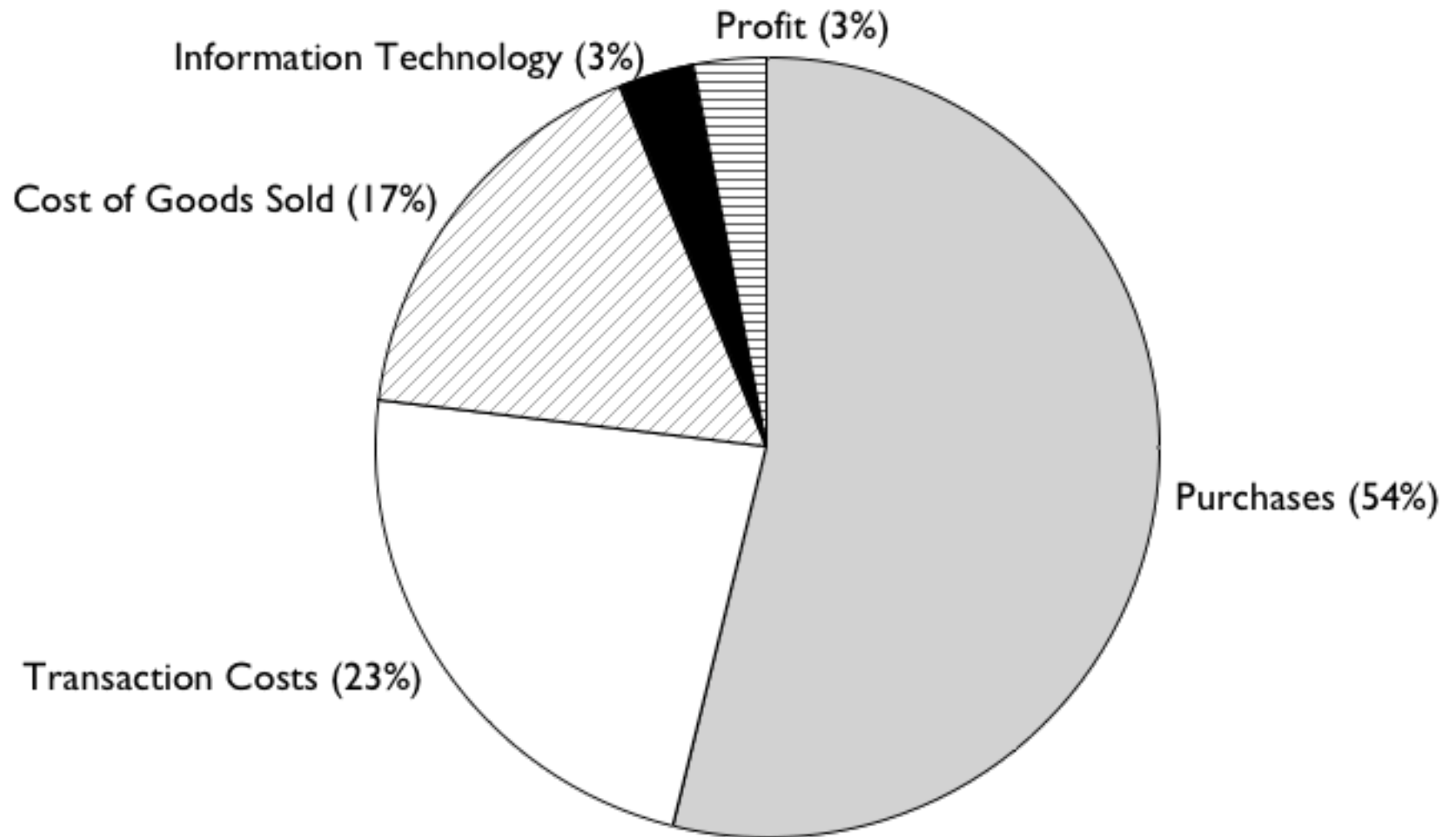
Wide Range of I.T. Spending

Economic Sector	Cost of Goods/ Sales	Transaction Costs/ Sales	Profit/ Sales	Median Sales/ Employee	Median I.T./ Employee	Range in Estimated I.T./ Employee
Materials	76.4%	15.1%	1.3%	\$263,291	\$4,085	\$800 to \$11,774
Consumer	70.7%	18.8%	2.0%	\$104,810	\$2,401	\$404 to \$13,831
Consumer Staples	53.7%	31.7%	4.3%	\$196,167	\$6,095	\$1,252 to \$18,014
Health Care	53.7%	44.6%	1.8%	\$153,206	\$10,637	\$1,045 to \$35,138
Energy	60.2%	12.5%	5.2%	\$789,720	\$8,762	\$1,012 to \$32,173
Financials	37.6%	27.4%	14.6%	\$220,265	\$6,958	\$2,002 to \$26,108
Industrials	69.3%	19.7%	0.5%	\$162,758	\$3,814	\$1,118 to \$16,760
Information	57.7%	46.3%	-17.8%	\$139,683	\$9,475	\$1,136 to \$25,853
Telecommunication	48.6%	22.0%	-11.8%	\$290,955	\$7,450	\$322 to \$29,528

Information Productivity®

® Information Productivity is a Registered Trademark of Strassmann, Inc.

Distribution of Corporate Costs



5,913 Firms

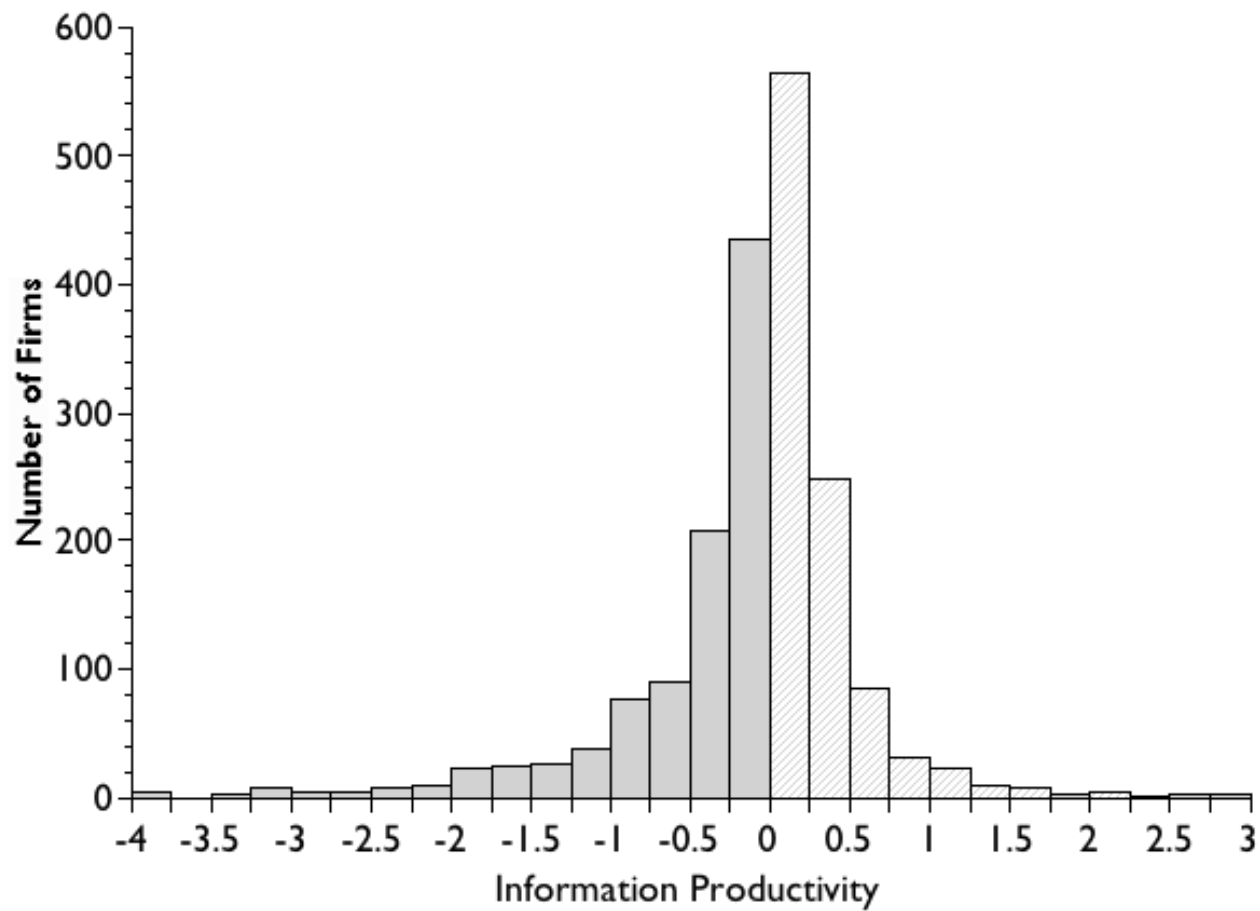
Comparison of I.T. Ratios and Performance for Banks

Company Name	2004 I.T. Spending - \$Millions	COST RATIO: I.T. / Compensation -%	PERFORMANCE RATIO: Information Productivity - %
WELLS FARGO	\$714	8.0%	43.0%
BANK OF AMERICA	\$2,055	15.0%	30.1%
HIBERNIA CORP	\$38	11.3%	33.0%
HUNTINGTON BANCSHARES	\$92	18.9%	36.0%
CITICORP	\$3,586	25.1%	14.0%
STATE STREET CORP	\$527	26.9%	-2.0%
JPMORGAN CHASE	\$3,702	25.5%	-95.0%

Transaction Costs and Profits are Unrelated

Company Name	Profit/ Sales	Cost of Goods - \$Millions	Transaction Costs - \$Millions	Transaction Costs/ Cost of Goods
ROYAL DUTCH/SHELL	5.2%	\$142,760	\$13,018	9%
DEUTSCHE BANK	0.7%	\$32,174	\$13,504	42%
VOLKSWAGEN	2.7%	\$72,193	\$13,873	19%
FRANCE TELECOM	-44.5%	\$19,667	\$13,948	71%
CITICORP	16.3%	\$25,074	\$14,145	56%
JOHNSON &	18.2%	\$8,785	\$16,173	184%
GLAXOSMITHKLINE	18.5%	\$5,484	\$16,874	308%
UNILEVER	4.4%	\$23,794	\$17,908	75%
SIEMENS	3.1%	\$56,372	\$19,935	35%
GENERAL MOTORS	0.9%	\$140,406	\$23,624	17%
DAIMLERCHRYSLER	3.3%	\$112,880	\$25,504	23%
NESTLE	8.5%	\$25,873	\$28,699	111%

Distribution of Information Productivity is Symmetric



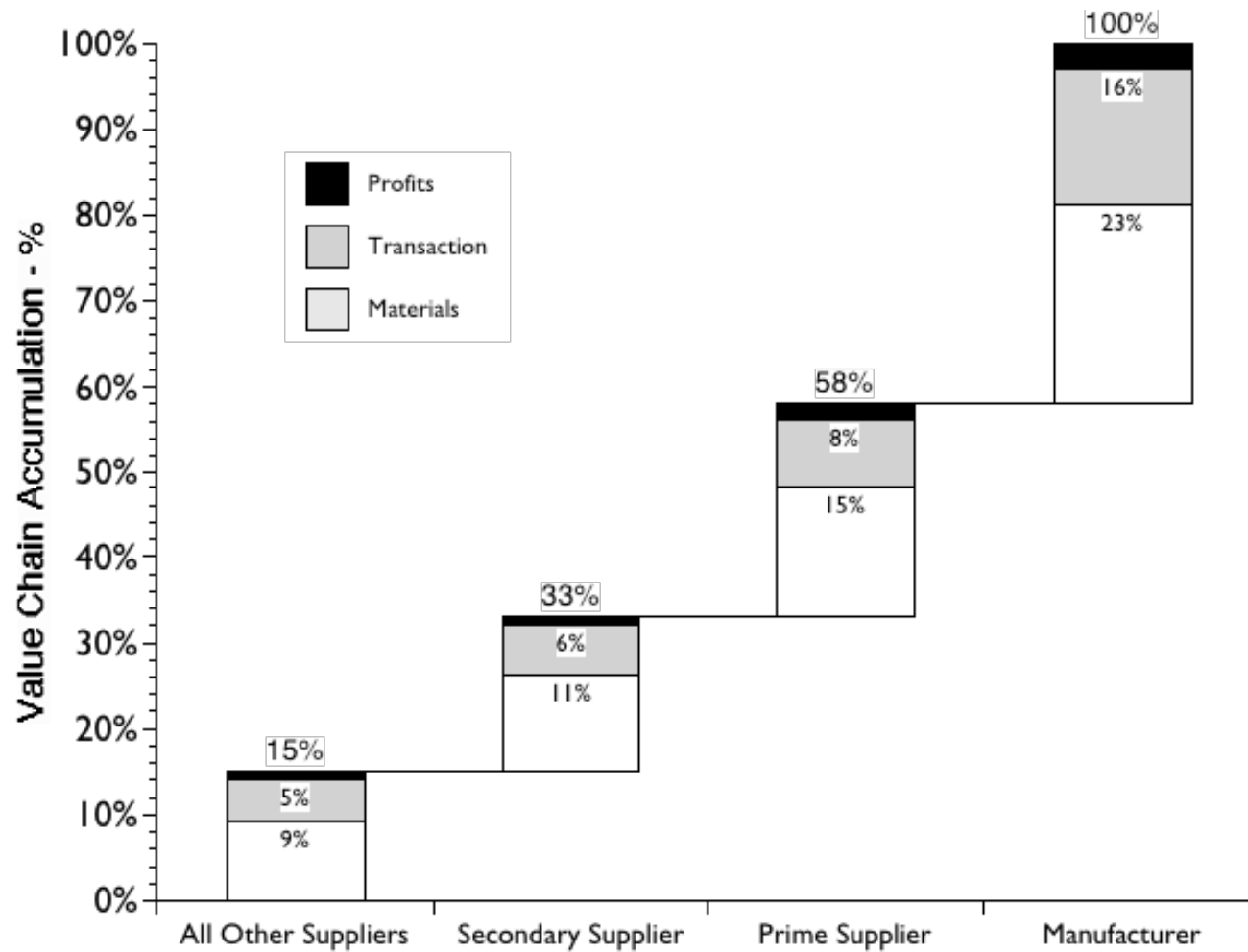
Calculation of Information Productivity

Calculate Information Value-Added (IVA)		EXAMPLE
A	PROFIT. Net income before adjustments.	\$515,000,000
B	EXPECTED RATE OF RETURN ON CAPITAL (Capital Asset Pricing Model)	7.20%
C	SHAREHOLDER EQUITY. Total Assets minus Total Liabilities	\$3,160,000,000
$D = B * C$	RETURN a company should be earning on its invested net capital assets.	\$227,583,200
E	INFORMATION MANAGEMENT VALUE-ADDED, or IVA	\$287,416,800
Calculate Information Productivity		
F	TRANSACTION COSTS. Financial, production, sales and other transactions; Sales, General & Administrative Expense	\$37,000,000
$G = E / F$	INFORMATION PRODUCTIVITY. Divide the IVA calculated above by your company's transaction costs.	776.80%

Higher Compensation Does Not Call for More Outsourcing

Company	Average Compensation per Employee	Outsourcing Ratio - %	Return on Assets - %
Johnson & Johnson	\$90,461	45.2%	14.9%
Wyeth	\$57,336	59.2%	6.6%

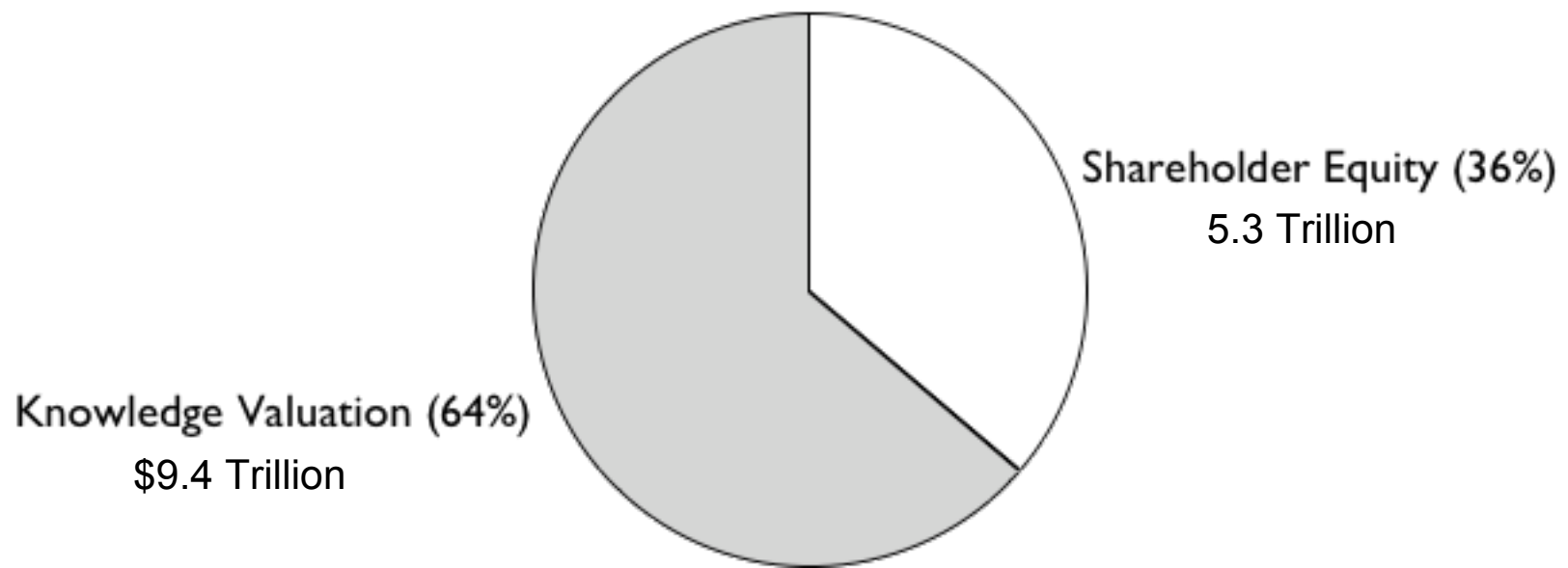
Cascading of Outsourcing Through the Value-Chain



Knowledge Capital ®

® Knowledge Capital is a Registered Trademark of Strassmann,
Inc.

Knowledge Valuation and Shareholder Equity for 5,913 Firms (2005)



Total Valuation \$14.7 Trillion

Knowledge Value per Employee

Company Name	Market Value - \$ Millions	Financial Value- \$ Millions	Knowledge Value - \$ Millions	Knowledge Value/ Book Value	Employees - 000s	Knowledge Value / Employee - \$
JOHNSON & JOHNSON	\$188,213	\$31,813	\$156,400	492%	109.9	\$1,423,114
GLAXOSMITHKLINE	\$139,032	\$11,352	\$127,680	1125%	99.8	\$1,278,880
NOVARTIS	\$122,651	\$33,783	\$88,868	263%	81.4	\$1,091,851
WYETH	\$56,823	\$9,848	\$46,976	477%	51.4	\$913,903
ROCHE	\$81,743	\$24,731	\$57,012	231%	64.7	\$881,137
ASTRAZENECA	\$59,900	\$14,418	\$45,482	315%	64.2	\$708,440
NOVO-NORDISK	\$16,330	\$4,824	\$11,505	238%	20.3	\$567,189
SCHERING	\$14,419	\$4,074	\$10,346	254%	25.6	\$404,242

Knowledge Value, Compensation and Net Worth of Employees

Company Name	2004 Knowledge Value/Employee	Employee Compensation in 2004	Worth of an Employee
JOHNSON & GLAXOSMITHKLIN	\$282,723	\$100,764	\$181,959
NOVARTIS	\$628,707	\$90,276	\$538,431
WYETH	\$88,463	\$85,807	\$2,656
ROCHE	\$476,222	\$63,818	\$412,403
ASTRAZENECA	\$153,463	\$109,684	\$43,779
NOVO-NORDISK	\$158,133	\$82,414	\$75,719
	\$123,923	\$83,655	\$40,268

Most of Profits Derived from Knowledge Assets

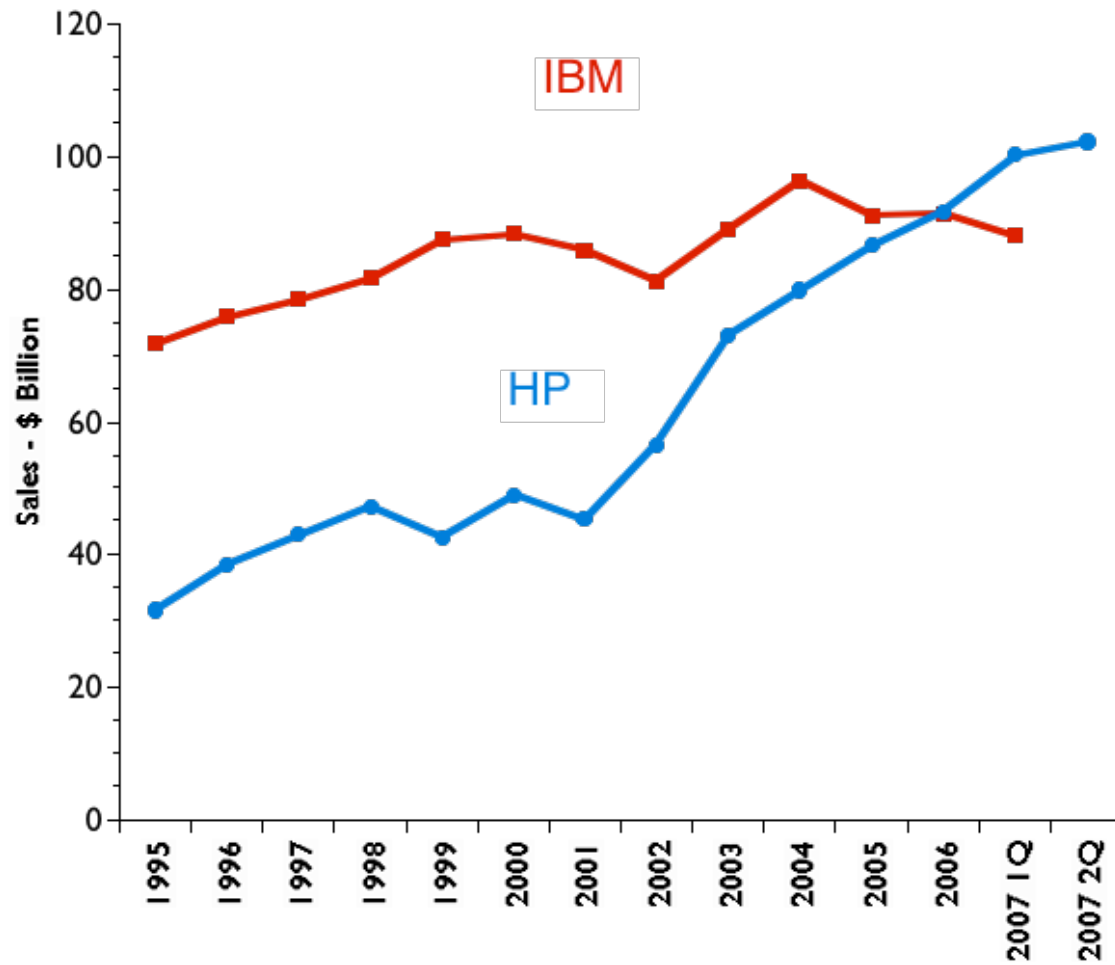
Company Name	Knowledge Value-Added - \$ Millions	Total Profit - \$ Millions	% of Profit from Financial Assets	% of Profit from Knowledge Assets
JOHNSON & JOHNSON	\$7,223	\$8,509	15.1%	84.9%
GLAXOSMITHKLINE	\$7,750	\$8,246	6.0%	94.0%
NOVARTIS	\$4,726	\$5,767	18.0%	82.0%
WYETH	\$158	\$1,234	87.2%	12.8%
ROCHE	\$3,951	\$5,819	32.1%	67.9%
ASTRAZENECA	\$2,793	\$3,813	26.8%	73.2%
NOVO-NORDISK	\$471	\$912	48.4%	51.6%
SCHERING	\$368	\$677	45.7%	54.3%

Sector Distribution of Knowledge Capital/Employee

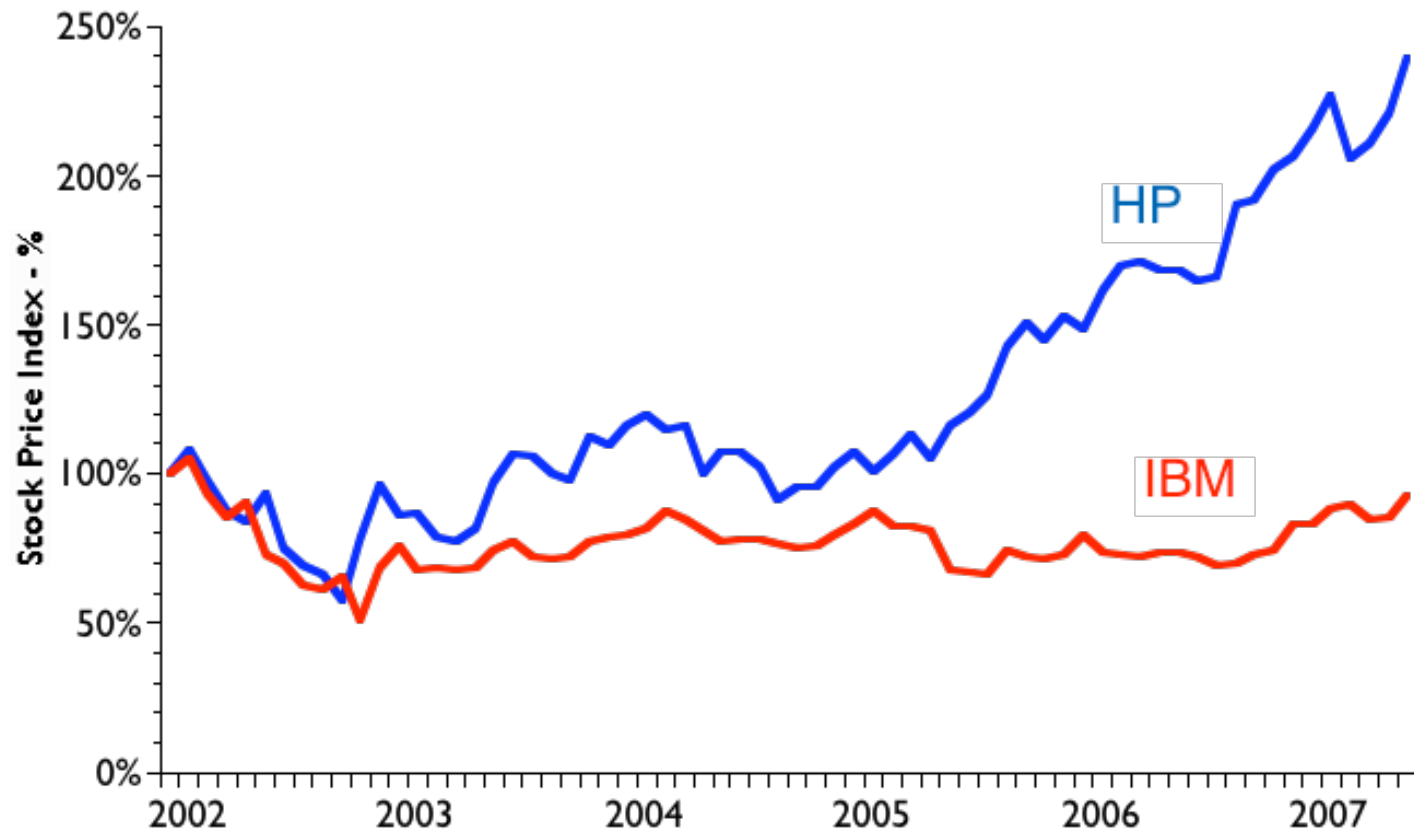
Sector	Employees	Knowledge Capital / Employee - \$
Materials	1,341,750	\$127,610
Consumer Discretionary	10,813,962	\$60,097
Consumer Staples	5,165,155	\$87,285
Health Care	2,531,137	\$366,398
Energy	681,928	\$455,135
Financial	3,352,421	\$328,486
Industrial	7,624,743	\$76,249
Information Technology	3,136,534	\$259,323
Telecommunications	767,444	\$187,323
Utilities	569,073	\$265,227

Case Study

HP vs. IBM Sales



Stock Price of HP vs. IBM



HP Business Transformation Program - 2004 to 2008

- Reduce number of applications from 5,000 to 1,500.
- Reduce the number of servers from 19,000 to 10,000.
- Increase server utilization from 20% to 80%.
- Consolidate 100 world sites for I.T. development to 29.
- Consolidate 85 data centers to six.
- Build a data warehouse to be SOA accessible.
- Reduce I.T. workforce from 19,000 to 8,000.
- 80% of staff on new projects, 20% on maintenance.

Projected I.T. Budget

	HP - 2004	HP - 2008
I.T. Spending - \$ Billions	\$3.04	\$2.11

Summary

- You can over-spend or under-spend on I.T. in comparison with your benchmark peers, but all this will measure is efficiency, not effectiveness.
- You can over-spend on I.T. as long as your Information Productivity is superior.
- You can over-spend on I.T. as long as the Knowledge Valuation of your people is superior.