Appendix A: ICB industry classification structure

ICB industry 1-digit industry code		ICB supersector 2-digit industry code		ICB sector 3-digit industry code		ICB subsector 4-digit industry code	
Code	Name	Code	Name	Code	Name	Code	Name
0001	Oil & Gas	0500	Oil & Gas	0530	Oil & Gas Producers	0533	Exploration & Production
						0537	Integrated Oil & Gas
				0570	Oil Equipment, Services & Distribution	0573	Oil Equipment & Services
						0577	Pipelines
1000	Basic Materials	1300	Chemicals	1350	Chemicals	1353	Commodity Chemicals
						1357	Specialty Chemicals
		1700	Basic Resources	1730	Forestry & Paper	1733	Forestry
						1737	Paper
				1750	Industrial Metals	1753	Aluminum
						1755	Nonferrous Metals
						1757	Steel
				1770	Mining	1771	Coal
						1773	Diamonds & Gemstones
						1775	General Mining
						1777	Gold Mining
						1779	Platinum & Precious Metals
2000	Industrials	2300	Construction & Materials	2350	Construction & Materials	2353	Building Materials & Fixtures
						2357	Heavy Construction
		2700	Industrial Goods & Services	2710	Aerospace & Defense	2713	Aerospace
						2717	Defense
				2720	General Industrials	2723	Containers & Packaging
						2727	Diversified Industrials
				2730	Electronic & Electrical Equipment	2733	Electrical Components & Equipment
						2737	Electronic Equipment

				2750	Industrial Engineering	2753	Commercial Vehicles & Trucks
						2757	Industrial Machinery
				2770	Industrial Transportation	2771	Delivery Services
						2773	Marine Transportation
						2775	Railroads
						2777	Transportation Services
						2779	Trucking
				2790	Support Services	2791	Business Support Services
						2793	Business Training & Employment
						2795	Financial Administration
						2797	Industrial Suppliers
						2799	Waste & Disposal Services
3000	Consumer Goods	3300	Automobiles & Parts	3350	Automobiles & Parts	3353	Automobiles
						3355	Auto Parts
						3357	Tires
		3500	Food & Beverage	3530	Beverages	3533	Brewers
						3535	Distillers & Vintners
						3537	Soft Drinks
				3570	Food Producers	3573	Farming & Fishing
						3577	Food Products
		3700	Personal & Household Goods	3720	Household Goods	3722	Durable Household Products
						3724	Nondurable Household Products
						3726	Furnishings
						3728	Home Construction
				3740	Leisure Goods	3743	Consumer Electronics
						3745	Recreational Products
						3747	Toys
				3760	Personal Goods	3763	Clothing & Accessories
						3765	Footwear
						3767	Personal Products
				3780	Tobacco	3785	Tobacco

4000	Health Care	4500	Health Care	4530	Health Care Equipment & Services	4533	Health Care Providers
						4535	Medical Equipment
						4537	Medical Supplies
				4570	Pharmaceuticals & Biotechnology	4573	Biotechnology
						4577	Pharmaceuticals
5000	Consumer Services	5300	Retail	5330	Food & Drug Retailers	5333	Drug Retailers
						5337	Food Retailers & Wholesalers
				5370	General Retailers	5371	Apparel Retailers
						5373	Broadline Retailers
						5375	Home Improvement Retailers
						5377	Specialized Consumer Services
						5379	Specialty Retailers
		5500	Media	5550	Media	5553	Broadcasting & Entertainment
						5555	Media Agencies
						5557	Publishing
		5700	Travel & Leisure	5750	Travel & Leisure	5751	Airlines
						5752	Gambling
						5753	Hotels
						5755	Recreational Services
						5757	Restaurants & Bars
						5759	Travel & Tourism
6000	Telecommunications	6500	Telecommunications	6530	Fixed Line Telecommunications	6535	Fixed Line Telecommunications
				6570	Mobile Telecommunications	6575	Mobile Telecommunications
7000	Utilities	7500	Utilities	7530	Electricity	7535	Electricity
				7570	Gas, Water & Multiutilities	7573	Gas Distribution
						7575	Multiutilities
						7577	Water
8000	Financials	8300	Banks	8350	Banks	8355	Banks
		8500	Insurance	8530	Nonlife Insurance	8532	Full Line Insurance
						8534	Insurance Brokers
						8536	Property & Casualty Insurance
						8538	Reinsurance
				8570	Life Insurance	8575	Life Insurance

		8700	Financial Services	8730	Real Estate	8733	Real Estate & Development
						8737	Real Estate Investment Trusts
				8770	General Financial	8771	Asset Managers
						8773	Consumer Finance
						8775	Specialty Finance
						8777	Investment Services
						8779	Mortgage Finance
				8980	Equity Investment Instruments	8985	Equity Investment Instruments
				8990	Nonequity Investment Instruments	8995	Nonequity Investment Instruments
9000	Technology	9500	Technology	9530	Software & PC Services	9533	Computer Services
						9535	Internet
						9537	Software
				9570	Hardware & Equipment	9572	Computer Hardware
						9574	Electronic Office Equipment
						9576	Semiconductors
						9578	Telecommunications Equipment

Appendix B: U.S. evidence

Sample characteristics and descriptive statistics

Panel A: Sample characteristics

Underlying index	Standard & Poor's 500
Regional coverage	United States
Industry classification used	Industry Classification Benchmark
Stocks within the sample	497
Period covered	10 years (1996-2005)

Panel B: Descriptive statistics of the sample

	Median	Mean	1st quartile	3rd quartile	Number of observations
Sales (mio $)	4669	10467	1872	10859	4861
EBITDA (mio $)	808	2067	368	1915	4314
EBIT (mio $)	606	1642	270	1409	4438
Net income (mio $)	323	817	152	731	4382
Total assets (mio $)	6393	28416	2478	18563	4854
Invested capital (mio $)	5078	16152	2089	11617	3683
Book value of equity (mio $)	2163	4862	1064	5159	4779
Operating cash flow (mio $)	569	1479	257	1320	4574
Cash dividend paid (mio $)	126	337	50	326	3605

Panel A presents the characteristics of the U.S. sample. From the 500 stocks within the S&P 500, three stocks (i.e., Dana Corporation, Scientific Atlanta, Sovereign Bank) are excluded because of ambiguous data. Panel B presents the analysis results of the pooled sample of annual data from 1996 to 2005. Annual accounting numbers are as of the beginning of January each year. Negative numbers are excluded.

Equity value multiples summary statistics

Equity value multiples	Median	Mean	1st quartile	3rd quartile	Number of observations
Accrual flow multiples					
P / SA	1.6	3.2	0.9	3.1	4729
P / GI	4.5	8.1	2.9	7.7	3971
P / EBITDA	8.6	15.9	5.4	13.3	4220
P / EBIT	11.5	24.8	7.6	17.9	4330
P / EBT	14.0	28.9	9.7	22.0	4334
P / E	20.8	53.6	14.7	32.8	4277
Book value multiples					
P / TA	1.1	2.2	0.5	2.3	4729
P / IC	1.5	2.2	0.8	2.6	3611
P / B	3.1	5.7	2.0	5.2	4664
Cash flow multiples					
P / OCF	12.3	33.4	7.6	20.6	4465
P / D	58.6	341.4	35.0	118.2	3555
Knowledge-related multiples					
P / (EBIT+R&D)	11.1	16.2	7.8	16.3	969
P / (EBIT+AIA)	11.9	18.1	8.2	18.2	1385
P / (EBIT+KC)	10.1	12.6	7.2	14.1	729
P / (E+R&D)	15.5	22.6	11.3	23.3	951
P / (E+AIA)	20.1	29.6	14.4	28.5	1339
P / (E+KC)	13.7	17.0	9.7	18.6	706
Forward-looking multiples					
P / SA 1	1.6	2.4	0.9	3.0	1467
P / SA 2	1.5	2.2	0.8	2.8	1461
P / EBITDA 1	8.2	11.6	5.3	11.9	1248
P / EBITDA 2	7.5	9.4	4.8	10.5	1237
P / EBIT 1	11.4	38.9	7.7	16.5	1067
P / EBIT 2	10.0	28.1	7.2	13.7	1060
P / EBT 1	12.4	20.3	9.1	17.1	1387
P / EBT 2	10.8	15.9	8.2	14.3	1414
P / E 1	14.7	30.7	11.6	18.4	1226
P / E 2	13.7	19.0	10.8	16.6	1171

Note: multiples are calculated for each firm i in year t using accounting numbers and mean consensus analyst forecasts as of the beginning of January and market prices as of the beginning of April. Criteria for the calculation of multiples and thus inclusion into the summary statistics are: (1) firm i is part of the sample; (2) the market capitalization of firm i is above 200 million U.S. Dollar and the value of net debt is positive in an individual year t; and (3) the underlying value driver x of an individual multiple λ of firm i in year t is positive.

Absolute valuation accuracy of equity value multiples

		Analysis of absolute valuation errors				Fractions	
		Median	Mean	1st quartile	3rd quartile	Fraction < 0.15	Fraction < 0.25
Equity value multiples	**Accrual flow multiples**						
	P / SA	0.3987	0.7139	0.1728	0.7368	0.2556	0.3742
	P / GI	0.3501	0.5480	0.1426	0.6264	0.2721	0.3915
	P / EBITDA	0.2932	0.5530	0.1218	0.5893	0.3178	0.4734
	P / EBIT	0.2759	0.4990	0.1086	0.5861	0.3356	0.4831
	P / EBT	0.2637	0.4073	0.0996	0.5050	0.3513	0.4936
	P / E	**0.2483**	**0.3904**	**0.0973**	**0.4866**	**0.3584**	**0.5122**
	Book value multiples						
	P / TA	0.3949	0.7288	0.1702	0.7209	0.2595	0.3766
	P / IC	0.3783	0.6930	0.1541	0.7179	0.2708	0.3848
	P / B	**0.3136**	**0.5092**	**0.1256**	**0.5929**	**0.3170**	**0.4484**
	Cash flow multiples						
	P / OCF	**0.3226**	**0.5461**	**0.1329**	**0.6146**	**0.2987**	**0.4371**
	P / D	0.3890	0.5958	0.1578	0.6810	0.2905	0.4129
	Knowledge-related multiples						
	P / (EBIT+R&D)	0.2761	0.3764	0.1022	0.5011	0.3333	0.4758
	P / (EBIT+AIA)	0.2637	0.5410	0.1049	0.5354	0.3375	0.4972
	P / (EBIT+KC)	0.2734	0.3810	0.1072	0.5007	0.3442	0.4781
	P / (E+R&D)	0.2625	0.3691	0.1056	0.4961	0.3295	0.4839
	P / (E+AIA)	**0.2374**	**0.4903**	**0.0954**	**0.4765**	**0.3795**	**0.5246**
	P / (E+KC)	0.2642	0.3696	0.1136	0.4897	0.3218	0.4816
	Forward-looking multiples						
	P / SA 1	0.3610	0.7664	0.1537	0.7319	0.2743	0.4201
	P / SA 2	0.3620	0.7579	0.1619	0.6898	0.2649	0.4214
	P / EBITDA 1	0.2539	0.4261	0.1122	0.4551	0.3658	0.5257
	P / EBITDA 2	0.2392	0.3951	0.0957	0.4283	0.4011	0.5455
	P / EBIT 1	0.2468	2.9614	0.1025	0.4559	0.3884	0.5485
	P / EBIT 2	0.2206	1.2755	0.0933	0.3899	0.4182	0.5845
	P / EBT 1	0.2269	1.5074	0.1009	0.3977	0.3783	0.5577
	P / EBT 2	0.1881	0.2645	0.0867	0.3336	0.4394	0.6289
	P / E 1	**0.1710**	**0.2232**	**0.0676**	**0.2981**	**0.5016**	**0.6777**
	P / E 2	**0.1412**	**0.2010**	**0.0535**	**0.2530**	**0.5619**	**0.7376**

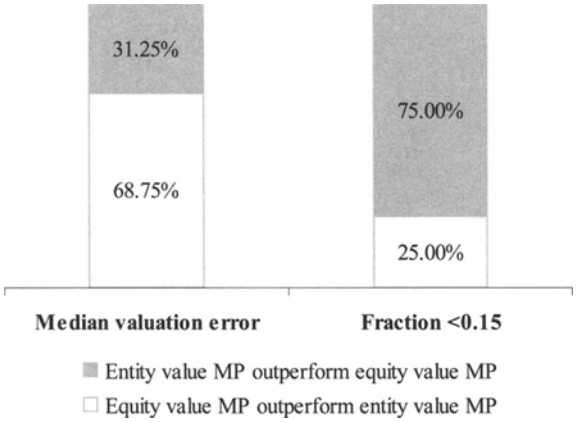
Note: statistical measures of absolute valuation accuracy (median, mean, 1st and 3rd quartile) are based on scaled absolute valuation errors (see equation (5.7)). The fraction <0.15 (<0.25) measures the proportion of scaled absolute valuation errors below 15 percent (25 percent).

Performance of equity value versus entity value multiples (table)

			Median valuation errors		Fraction < 0.15	
			Absolute difference	Relative difference (%)	Absolute difference	Relative difference (%)
Overall comparison						
Equity value MP	vs.	Entity value MP	-0.0451	-16.12%	-0.0086	-4.43%
Accrual flow multiples						
P / SA	vs.	EV / SA	-0.0516	-12.95%	0.0229	8.97%
P / GI	vs.	EV / GI	-0.0166	-4.74%	-0.0084	-3.08%
P / EBITDA	vs.	EV / EBITDA	0.0237	8.07%	-0.0298	-9.38%
P / EBIT	vs.	EV / EBIT	-0.0107	-3.87%	-0.0016	-0.47%
Book value multiples						
P / TA	vs.	EV / TA	0.0189	4.79%	-0.0274	-10.58%
P / IC	vs.	EV / IC	0.0451	11.92%	-0.0296	-10.91%
Cash flow multiples						
P / CFO	vs.	EV / CFO	-0.0528	-16.36%	0.0018	-29.87%
Knowledge-related multiples						
P / (EBIT+R&D)	vs.	EV / (EBIT+R&D)	0.0337	12.20%	-0.0544	-16.31%
P / (EBIT+AIA)	vs.	EV / (EBIT+AIA)	-0.0068	-2.59%	-0.0011	-0.33%
P / (EBIT+KC)	vs.	EV / (EBIT+KC)	0.0450	16.45%	-0.0300	-8.73%
Forward-looking multiples						
P / SA 1	vs.	EV / SA 1	-0.1531	-42.41%	0.0294	10.72%
P / SA 2	vs.	EV / SA 2	-0.1497	-41.34%	0.0120	4.51%
P / EBITDA 1	vs.	EV / EBITDA 1	-0.1196	-47.10%	-0.0074	-2.01%
P / EBITDA 2	vs.	EV / EBITDA 2	-0.0768	-32.08%	-0.0209	-5.20%
P / EBIT 1	vs.	EV / EBIT 1	-0.1096	-44.38%	0.0095	2.46%
P / EBIT 2	vs.	EV / EBIT 2	-0.1402	-63.58%	-0.0025	-0.60%

Note: negative numbers for the absolute (relative) difference of median valuation errors indicate that equity value multiples outperform entity value multiples. For instance, using the P/SA multiple instead of the EV/SA multiple reduces the absolute (relative) median valuation error on average by 5.16 percentage points (12.95 percent). Positive numbers for the absolute (relative) difference of the fraction <0.15 also indicate that equity value multiples outperform entity value multiples. For instance, using the P/SA multiple instead of the EV/SA multiple increases the fraction of valuation errors below 15 percent on average by 2.29 percentage points in absolute terms and by 8.97 percent in relative terms. For the overall comparison, the average of the individual differences is taken.

Performance of equity value versus entity value multiples (figure)



Note: the numbers are based on the relative performance of individual equity value versus entity value multiples in the preceding table (n = 2x16).

Performance of knowledge-related versus traditional multiples

	Absolute performance		Rankings within the same multiple type		Composite ranking of both multiple types	
	Median error	Fraction < 0.15	Median error	Fraction < 0.15	Median error	Fraction < 0.15
Traditional accrual flow multiples						
P / SA	0.4675	0.2059	6	6	12	12
P / GI	0.3791	0.2255	5	5	11	11
P / EBITDA	0.3730	0.2422	4	4	10	10
P / EBIT	0.3626	0.2670	3	3	9	9
P / EBT	0.3545	0.2776	2	1	8	7
P / E	0.3451	0.2718	1	2	7	8
Knowledge-related multiples						
P / (EBIT+R&D)	0.3143	0.3007	5	5	5	5
P / (EBIT+AIA)	0.2820	0.3154	4	4	4	4
P / (EBIT+KC)	0.3212	0.2839	6	6	6	6
P / (E+R&D)	0.2399	0.3456	1	1	1	1
P / (E+AIA)	0.2767	0.3319	3	2	3	2
P / (E+KC)	0.2698	0.3287	2	3	2	3

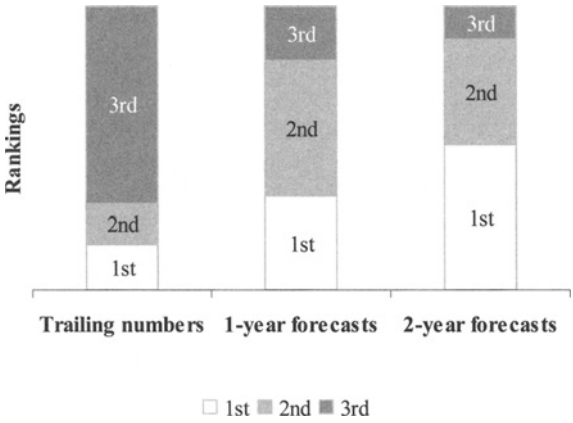
Note: science based industries are identified on the ICB supersector level (2-digit codes) and include oil & gas (0500), chemicals (1300), basic resources (1700), industrial goods & services (2700), automobiles & parts (3300), personal & household goods (3700), health care (4500), and technology (9500). The calculation of absolute performance numbers is limited to these eight industries.

Performance of forward-looking versus trailing multiples (table)

			Median valuation error		Fraction < 0.15	
			Absolute difference	Relative difference (%)	Absolute difference	Relative difference (%)
Overall comparison						
1-year forecasts	vs.	Trailing numbers	-0.0440	-15.70%	0.0579	17.16%
2-year forecasts	vs.	Trailing numbers	-0.0657	-23.89%	0.0934	27.26%
2-year forecasts	vs.	1-year forecasts	-0.0217	-10.13%	0.0354	8.42%
Sales						
P / SA 1	vs.	P / SA	-0.0376	-9.44%	0.0187	7.30%
P / SA 2	vs.	P / SA	-0.0366	-9.18%	0.0093	3.63%
P / SA 2	vs.	P / SA 1	0.0010	0.29%	-0.0094	-3.42%
EBITDA						
P / EBITDA 1	vs.	P / EBITDA	-0.0393	-13.39%	0.0480	15.11%
P / EBITDA 2	vs.	P / EBITDA	-0.0539	-18.40%	0.0833	26.20%
P / EBITDA 2	vs.	P / EBITDA 1	-0.0147	-5.78%	0.0352	9.63%
EBIT						
P / EBIT 1	vs.	P / EBIT	-0.0291	-10.54%	0.0528	15.74%
P / EBIT 2	vs.	P / EBIT	-0.0553	-20.06%	0.0826	24.62%
P / EBIT 2	vs.	P / EBIT 1	-0.0263	-10.64%	0.0298	7.67%
EBT						
P / EBT 1	vs.	P / EBT	-0.0368	-13.96%	0.0269	7.66%
P / EBT 2	vs.	P / EBT	-0.0756	-28.67%	0.0881	25.07%
P / EBT 2	vs.	P / EBT 1	-0.0388	-17.09%	0.0612	16.17%
Earnings						
P / E 1	vs.	P / E	-0.0774	-31.15%	0.1432	39.97%
P / E 2	vs.	P / E	-0.1072	-43.15%	0.2035	56.79%
P / E 2	vs.	P / E 1	-0.0298	-17.42%	0.0603	12.02%

Note: negative numbers for the absolute (relative) difference of median valuation errors indicate that forward-looking multiples outperform trailing multiples. For instance, using the P/E1 multiple instead of the P/E multiple reduces the absolute (relative) median valuation error on average by 7.74 percentage points (31.15 percent). Positive numbers for the absolute (relative) difference of the fraction <0.15 also indicate that forward-looking multiples outperform trailing multiples. For instance, using the P/E1 multiple instead of the P/E multiple increases the fraction of valuation errors below 15 percent on average by 14.32 percentage points in absolute terms and by 39.97 percent in relative terms. For the overall comparison, the average of the individual differences is taken.

Performance of forward-looking versus trailing multiples (figure)



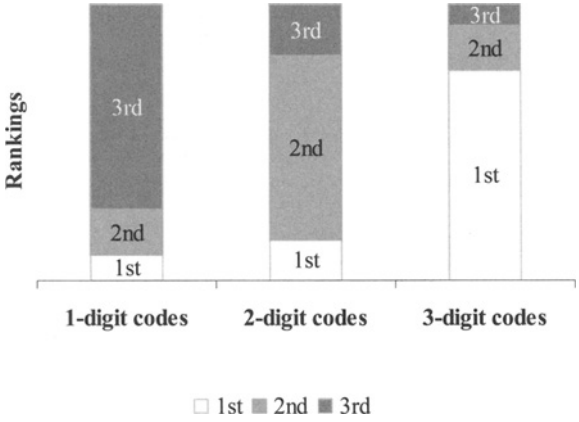
Note: the three bars indicate first, second, and third ranks of multiples based on trailing numbers, one-year forecasts, and two-year forecasts for pairwise performance evaluations (n = 279) on the ICB sector level (3-digit codes).

Performance of multiples depending on the industry fineness (table)

			Median valuation error		Fraction < 0.15	
			Absolute difference	Relative difference (%)	Absolute difference	Relative difference (%)
Overall comparison						
ICB sectors	vs.	ICB supersectors	-0.0169	-5.54%	0.0202	6.52%
ICB sectors	vs.	ICB industries	-0.0274	-8.60%	0.0566	17.17%
ICB supersectors	vs.	ICB industries	-0.0105	-2.89%	0.0365	11.27%
Accrual flow multiples						
ICB sectors	vs.	ICB supersectors	-0.0222	-7.28%	0.0216	6.85%
ICB sectors	vs.	ICB industries	-0.0381	-12.49%	0.0465	14.76%
ICB supersectors	vs.	ICB industries	-0.0159	-4.85%	0.0249	8.49%
Book value multiples						
ICB sectors	vs.	ICB supersectors	-0.0182	-5.01%	0.0234	8.29%
ICB sectors	vs.	ICB industries	-0.0280	-7.72%	0.0493	17.46%
ICB supersectors	vs.	ICB industries	-0.0098	-2.58%	0.0259	10.00%
Cash flow multiples						
ICB sectors	vs.	ICB supersectors	-0.0187	-5.26%	0.0337	11.42%
ICB sectors	vs.	ICB industries	-0.0413	-11.61%	0.0514	17.43%
ICB supersectors	vs.	ICB industries	-0.0226	-6.04%	0.0177	6.79%
Knowledge-related multiples						
ICB sectors	vs.	ICB supersectors	-0.0135	-5.15%	0.0111	3.27%
ICB sectors	vs.	ICB industries	-0.0317	-12.05%	0.0505	14.82%
ICB supersectors	vs.	ICB industries	-0.0181	-6.57%	0.0394	11.94%
Forward-looking multiples						
ICB sectors	vs.	ICB supersectors	-0.0121	-5.02%	0.0111	2.78%
ICB sectors	vs.	ICB industries	0.0021	0.86%	0.0855	21.41%
ICB supersectors	vs.	ICB industries	0.0142	5.60%	0.0744	19.16%

Note: negative numbers for the absolute (relative) difference of median valuation errors indicate that a finer industry definition outperforms a broader industry definition. For instance, using the ICB sector (3-digit codes) definition instead of the ICB supersector (2-digit codes) definition for accrual flow multiples reduces the absolute (relative) median valuation error on average by 2.22 percentage points (7.28 percent). Positive numbers for the absolute (relative) difference of the fraction <0.15 also indicate that a finer industry definition outperforms a broader industry definition. For instance, using the ICB sector (3-digit codes) definition instead of the ICB supersector (2-digit codes) definition for accrual flow multiples increases the fraction of valuation errors below 15 percent on average by 2.16 percentage points in absolute terms and by 6.85 percent in relative terms. For the overall comparison, the average of the individual differences is taken.

Performance of multiples depending on the industry fineness (figure)



Note: the three bars indicate first, second, and third ranks of 1-digit, 2-digit, and 3-digit industry codes based on pairwise performance evaluations of 27 equity value multiples for both key performance indicators (n = 2x27).

S&P 500 industry weights

ICB industry 1-digit codes			ICB supersector 2-digit codes		
Code	Name	Weight	Code	Name	Weight
0001	Oil & Gas	9.66%	**0500**	**Oil & Gas**	**9.66%**
1000	Basic Materials	2.73%	1300	Chemicals	1.64%
			1700	Basic Resources	1.09%
2000	Industrials	12.15%	2300	Construction & Materials	0.47%
			2700	**Industrial Goods & Services**	**11.68%**
3000	Consumer Goods	9.27%	3300	Automobiles & Parts	0.54%
			3500	Food & Beverage	3.23%
			3700	Personal & Household Goods	5.50%
4000	Health Care	12.85%	**4500**	**Health Care**	**12.85%**
5000	Consumer Services	11.35%	5300	Retail	6.84%
			5500	Media	2.65%
			5700	Travel & Leisure	1.87%
6000	Telecommunications	3.33%	6500	Telecommunications	3.33%
7000	Utilities	3.25%	7500	Utilities	3.25%
8000	Financials	21.11%	**8300**	**Banks**	**10.36%**
			8500	Insurance	4.52%
			8700	Financial Services	6.23%
9000	Technology	14.29%	**9500**	**Technology**	**14.29%**

Note: weights are calculated based on market data of the S&P 500 as of February 15, 2006.

Industry-preferred multiples in U.S. key industries

	Best performing multiples				Ranges	
	1st	2nd	3rd	4th	1st	4th
Oil & Gas						
Median pricing error	**P / B**	**P / (E+R&D)**	P / (EBIT+R&D)	P / IC	0.2466	0.3747
Including forecasts	**P / E 2**	P / E 1	P / B	P / EBIT 2	0.1403	0.3100
Fraction < 0.15	**P / B**	P / IC	**P / (E+R&D)**	P / (EBIT+R&D)	0.3163	0.2353
Including forecasts	**P / E 2**	P / E 1	P / B	P / IC	0.5116	0.2500
Industrial Goods & Services						
Median pricing error	**P / (E+KC)**	P / (E+R&D)	P / (E+AIA)	P / (EBIT+R&D)	0.2539	0.2978
Including forecasts	P / E 1	**P / E 2**	P / EBT 2	P / EBIT 2	0.1505	0.2199
Fraction < 0.15	P / (E+R&D)	**P / (E+KC)**	P / (EBIT+KC)	P / (E+AIA)	0.3254	0.2932
Including forecasts	P / E 1	**P / E 2**	P / EBT 2	P / EBT 1	0.4938	0.3617
Health Care						
Median pricing error	**P / (E+AIA)**	P / E	P / EBT	P / (EBIT+KC)	0.2748	0.2939
Including forecasts	**P / E 2**	P / E 1	P / EBT 2	P / EBT 1	0.1989	0.2254
Fraction < 0.15	P / EBIT	**P / (E+AIA)**	P / (EBIT+KC)	P / EBT	0.3095	0.2951
Including forecasts	P / E 1	**P / E 2**	P / EBT 2	P / EBT 1	0.3830	0.3224
Banks						
Median pricing error	**P / EBT**	P / E	P / EBIT	**P / B**	0.1530	0.1805
Including forecasts	P / E 1	P / EBT 2	P / EBT 1	**P / E 2**	0.0748	0.1062
Fraction < 0.15	**P / EBT**	P / E	P / EBIT	**P / B**	0.4926	0.4185
Including forecasts	P / E 1	P / EBT 2	P / EBT 1	**P / E 2**	0.7353	0.6531
Technology						
Median pricing error	**P / (E+KC)**	P / (EBIT+KC)	P / (E+AIA)	P / (EBIT+AIA)	0.2889	0.3428
Including forecasts	**P / E 2**	P / E 1	P / EBIT 2	P / (EBIT+KC)	0.2083	0.2889
Fraction < 0.15	**P / (E+KC)**	P / (EBIT+KC)	P / IC	P / (E+AIA)	0.3000	0.2529
Including forecasts	P / E 1	**P / E 2**	P / (E+KC)	P / (EBIT+KC)	0.3423	0.2849

Note: performance rankings are constructed for both key performance indicators within five U.S. key industries. The first ranking is always limited to trailing equity value multiples; the second ranking also considers forward-looking equity value multiples. The first four columns list the four best performing multiples in each ranking category. The last two columns report the absolute performance of the best and fourth-best performing multiple in each ranking category.

Correlations among selected value drivers

	EBT	E	BV	OCF	EBT 2	E 2	EBIT+R&D	E+R&D	E+AIA	E+KC
EBT	1.0000									
E	0.9910	1.0000								
BV	0.7580	0.7700	1.0000							
OCF	0.7830	0.7850	0.7930	1.0000						
EBT 2	0.9270	0.9260	0.9050	0.8370	1.0000					
E 2	0.8720	0.8780	0.8850	0.8730	0.9670	1.0000				
EBIT+R&D	0.8970	0.9000	0.8010	0.9380	0.8880	0.9040	1.0000			
E+R&D	0.9220	0.9390	0.8500	0.9060	0.9320	0.9360	0.9750	1.0000		
E+AIA	0.9660	0.9820	0.8250	0.8010	0.9360	0.8950	0.9220	0.9540	1.0000	
E+KC	0.8970	0.9180	0.8710	0.8980	0.9250	0.9320	0.9730	0.9930	0.9550	1.0000

Note: the correlation matrix shows Pearson correlation coefficients, which are calculated using the pairwise deletion method (n = 668).

Factors and weights of the two-factor multiples valuation model in U.S. key industries

	Factors		Optimal weights		Proposed weights	
	Multiple 1	Multiple 2	Multiple 1	Multiple 2	Multiple 1	Multiple 2
Oil & Gas						
Excluding forecasts	P / (E+R&D)	P / B	0.5081	0.4919	0.5000	0.5000
Including forecasts	P / E 2	P / B	1.0000	0.0000	1.0000	0.0000
Industrial Goods & Services						
Excluding forecasts	P / (E + KC)	P / B	0.8473	0.1527	1.0000	0.0000
Including forecasts	P / E 2	P / B	0.9592	0.0408	1.0000	0.0000
Health Care						
Excluding forecasts	P / (E+AIA)	P / B	0.9211	0.0789	0.9000	0.1000
Including forecasts	P / E 2	P / B	0.8712	0.1288	0.9000	0.1000
Banks						
Excluding forecasts	P / EBT	P / B	0.5839	0.4161	0.5000	0.5000
Including forecasts	P / E 2	P / B	0.9505	0.0495	0.9000	0.1000
Technology						
Excluding forecasts	P / (E+KC)	P / B	1.0000	0.0000	1.0000	0.0000
Including forecasts	P / E 2	P / B	0.9696	0.0304	1.0000	0.0000

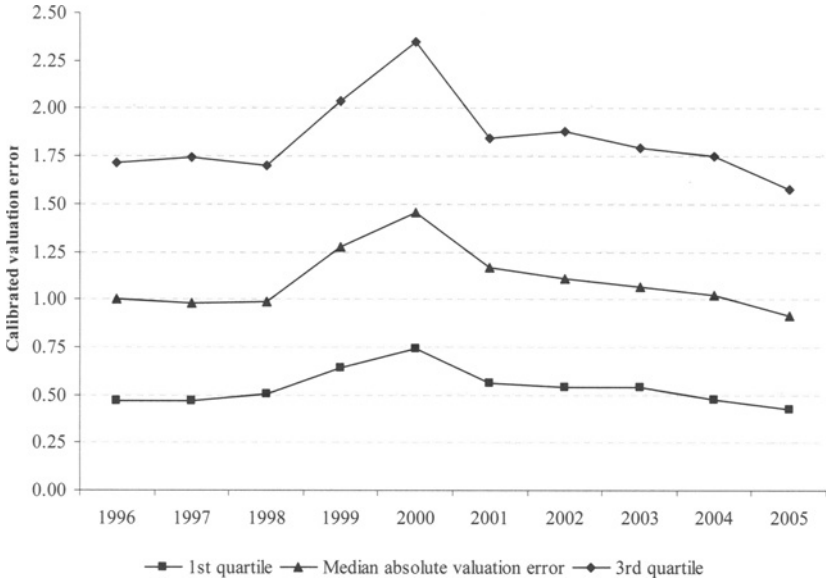
Note: the first factor represents the identified industry-preferred multiple in each industry and category. Optimal weights are derived by minimizing median absolute valuation errors. The optimization starts at the fifty-fifty weighting and is subject to the constraints that the weights are positive and add up to one. The proposed weights are derived by personal judgment.

Performance of single versus combined multiples in selected U.S. key industries

			Median absolute valuation errors			
			Excluding forecasts		Including forecasts	
			Absolute difference	Relative difference (%)	Absolute difference	Relative difference (%)
Oil & Gas						
2 factor model / proposed	vs.	Proposed single MP	-0.0176	-7.13%	0.0000	-0.02%
2 factor model / optimal	vs.	Proposed single MP	-0.0188	-7.61%	0.0000	-0.02%
2 factor model / optimal	vs.	2 factor model / proposed	-0.0012	-0.52%	0.0000	0.00%
Health Care						
2 factor model / proposed	vs.	Proposed single MP	-0.0212	-7.71%	-0.0019	-0.96%
2 factor model / optimal	vs.	Proposed single MP	-0.0228	-8.30%	-0.0042	-2.11%
2 factor model / optimal	vs.	2 factor model / proposed	-0.0016	-0.64%	-0.0023	-1.17%
Banks						
2 factor model / proposed	vs.	Proposed single MP	-0.0124	-8.11%	-0.0180	-16.92%
2 factor model / optimal	vs.	Proposed single MP	-0.0255	-16.66%	-0.0290	-27.31%
2 factor model / optimal	vs.	2 factor model / proposed	-0.0131	-9.31%	-0.0110	-12.50%

Note: negative numbers for the absolute (relative) difference of median valuation errors indicate that combined multiples outperform single multiples. For instance, using combined multiples in the two-factor model with proposed weights instead of proposed single multiples reduces the absolute (relative) median valuation error in the oil & gas industry on average by 1.76 percentage points (7.13 percent) when forecasts are excluded and by 0.003 percentage points (0.02 percent) when forecasts are included.

Time stability of calibrated absolute valuation errors in the U.S.



Note: to illustrate the time stability of valuation accuracy, calibrated performance indicators (median absolute valuation error, 1st and 3rd quartile) are calculated in each year from 1996 to 2005 for eleven representative equity value multiples. The arithmetic mean is used for the aggregation of performance indicators.

Appendix C: Definition of variables

Appendix C describes how the variables used to construct the multiples in the empirical study are defined. All financial statement, price, and forecast data is obtained from Thomson Financial in Zurich. Historical financial data is based on the Worldscope (WC) database, price data on the Datastream (DS) database, and analyst forecasts on the Institutional Brokers Estimate Service (I/B/E/S) database. Variable definitions except for those labeled are taken out of the database descriptions (Datastream (1996), I/B/E/S (2000), and Thomson Financial (2003)). The #s in parentheses refer to data items of DS, I/B/E/S, and WC.

Market price variables

- * Market value of common equity or market capitalization (P) represents the market value of a firm's outstanding common equity. P is calculated by multiplying the current number of common shares outstanding by the latest closing stock price (DS #MV). In the text, P sometimes also refers to the stock price itself.
- * Enterprise value (EV) represents the market value of a firm as a whole. EV is calculated as the sum of the market value of common equity (DS #MV) and the book value of net debt (ND), where ND equals book value of total debt (WC #03255) minus cash & equivalents (WC #02001) plus preferred stock (WC #03451).

Variables used to construct accrual flow multiples

- (Net) sales or revenues (SA) represent gross sales and other operating revenue less discounts, returns and allowances (WC #01001).
- Gross income (GI) represents the difference between sales or revenues and cost of goods sold (WC #01100).
- Earnings before interest, taxes, depreciation, and amortization (EBITDA) represent the earnings of a firm before interest expense, income taxes, depreciation, and amortization. It is calculated by taking the pre-tax income and adding

back interest expense on debt and depreciation, depletion, and amortization, and subtracting interest capitalized (WC #18198).

- Earnings before interest and taxes (EBIT) represent the earnings of a firm before interest expense and income taxes. It is calculated by taking the pre-tax income, adding back interest expense on debt, and subtracting interest capitalized (WC #18191).
- Earnings before taxes (EBT) or pre-tax income represent all income or loss before any federal, state or local taxes (WC #01401).
- Earnings (E) or net income available to common shareholders (NI) represent net income after all operating and non-operating income and expense, reserves, income taxes, minority interest, and extraordinary items (WC #01751).

Variables used to construct book value multiples

- Total assets (TA) represent the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment, and other assets (WC #02999).
- Book value of common equity (B) represents common shareholders' investment in a firm (WC #03501). It is the difference between total assets (WC #02999) and the book value of total debt (WC #03255).
- Invested capital (IC) equals total assets (WC #02999) minus cash & equivalents (WC #02001). IC represents the cumulative amount a firm has invested in its core operations.

Variables used to construct cash flow multiples

- Operating cash flow or cash flow from operating activities (OCF) represents the net cash receipts and disbursements resulting from the operations of a firm (WC #04860).
- Ordinary cash dividends (D) represent the total cash dividends paid on a firm's common stock during a fiscal year, including extra and special dividends (WC #18192).

Variables used to construct knowledge-related multiples

- Research and development expenditures (R&D) represent all direct and indirect costs related to the creation and development of new processes, techniques, applications, and products with commercial possibilities (WC #01201).
- Amortization of intangible assets (AIA) represents the cost allocation for intangible assets such as patents, leasehold improvements, trademarks, bookplates, tools, and film costs (WC #01149).
- * Knowledge costs (KC) equal R&D expenditures (WC #01201) plus amortization of intangible assets (WC #01149). KC serve as a proxy of a firm's cost for the creation and maintenance of intangible assets.

Variables used to construct forward-looking multiples

Forward-looking multiples are constructed for five value drivers from the income statement: SA, EBITDA, EBIT, EBT, and E. The fiscal year to which a forecast applies is identified in the forecast period indicator (FPI) variable: if FPI = 1, the forecast is for the current fiscal year (fiscal year 1) and if FPI = 2, it is for the next fiscal year (fiscal year 2). All forecasts represent mean consensus estimates of financial analysts recorded by I/B/E/S.

- SA 1 and SA 2 (I/B/E/S #SAL1 and #SAL2)
- EBITDA 1 and EBITDA 2 (I/B/E/S #EBD1 and #EBD2)
- EBIT 1 and EBIT 2 (I/B/E/S #EBT1 and #EBT2)
- EBT 1 and EBT 2 (I/B/E/S #PPS1 and #PPS2)
- E 1 and E 2 (I/B/E/S #INC1 and #INC2)

References

Aboody, D., 2006. Financial Statement Analysis: Free Cash Flows. Lecture notes, UCLA.

Aboody, D., Lev, B., 1998. The Value Relevance of Intangibles: The Case of Software Capitalization. Journal of Accounting Research 36, 161-191.

Aboody, D., Lev, B., 2000. Information Asymmetry, R&D, and Insider Gains. Journal of Finance 55, 2747-2766.

Achleitner, A.-K, 2002. Handbuch Investment Banking, 3rd edition. Gabler, Wiesbaden, Germany.

Alford, A.W., 1992. The Effect of the Set of Comparable Firms on the Accuracy of the Price-Earnings Valuation Method. Journal of Accounting Research 30, 94-108.

Ali, A., Hwang, L.-S., 2000. Country-Specific Factors Related to Financial Reporting and the Value Relevance of Accounting Data. Journal of Accounting Research 38, 1-21.

Amir, E., Lev, B., 1996. Value-relevance of nonfinancial information: The wireless communication industry. Journal of Accounting and Economics 22, 3-30.

Arzac, E.R., 2005. Valuation for Mergers, Buyouts, and Restructuring. Wiley, Hoboken, NJ.

Baker, M., Ruback, R.S., 1999. Estimating Industry Multiples. Working paper, Harvard University.

Ball, R., Brown, P., 1968. An Empirical Evaluation of Accounting Income Numbers. Journal of Accounting Research 6, 159-178.

Ballwieser, W., 2004. Unternehmensbewertung: Prozess, Methoden und Probleme. Schäffer Poeschel, Stuttgart, Germany.

Barclay, M.J., Smith, C.W., 2005. The Capital Structure Puzzle: The Evidence Revisited. Journal of Applied Corporate Finance 17, 8-17.

Barker, R.G., 1999a. Survey and Market-based Evidence of Industry-dependence in Analysts' Preferences Between the Dividend Yield and Price-earnings Ratio Valuation Models. Journal of Business and Accounting 26, 393-418.

Barker, R.G., 1999b. The role of dividends in valuation models used by analysts and fund managers. European Accounting Review 8, 195-218.

Barth, M.E., Beaver, W.H., Hand, J.R.M., Landsman, W.R., 2004. Accruals, Accounting-Based Valuation Models, and the Prediction of Equity Values. Working paper, Stanford University, University of North Carolina at Chapel Hill.

Basu, S., 1997. The conservatism principle and the asymmetric timeliness of earnings. Journal of Accounting and Economics 24, 3-37.

Beatty, R.P., Riffe, S.M., Thompson, R., 1999. The Method of Comparables and Tax Court Valuations of Private Firms: An Empirical Investigation. Accounting Horizons 13, 177-199.

Beaver, W.H., Morse, D., 1978. What determines price-earnings ratios? Financial analysts Journal 34, 65-78.

Begley, J., Feltham, G.A., 2002. The Relation between Market Values, Earnings Forecasts, and Reported Earnings. Contemporary Accounting Research 19, 1-48.

Benninga, S.Z., Sarig, O.H., 1997. Corporate Finance: A Valuation Approach. McGraw-Hill, New York, NY.

Berkman, H., Bradhury, M.E., Ferguson, J., 2000. The Accuracy of Price-Earnings and Discounted Cash Flow Methods of IPO Equity Valuation. Journal of International Financial Management and Accounting 11, 71-83.

Bernard, V.L., Thomas, J.K., 1989. Post-Earnings-Announcement Drift: Delayed Price Response or Risk Premium? Journal of Accounting Research 27, 1-36.

Bernard, V.L., Thomas, J.K., 1990. Evidence that stock prices do not fully reflect the implications of current earnings for future earnings. Journal of Accounting and Economics 13, 305-340.

Berndt, T., 2005. Financial Reporting: Grundlagen des Financial Reporting. Lecture notes, University of St.Gallen.

Bhojraj, S., Lee, C.M.C., 2002. Who Is My Peer? A Valuation Based Approach to the Selection of Comparable Firms. Journal of Accounting Research 40, 407-439.

Bhojraj, S., Lee, C.M.C., Ng, D.T., 2003. International Valuation Using Smart Multiples. Working paper, Cornell University.

Bhojraj, S., Lee, C.M.C., Oler, D.K., 2003. What's My Line? A Comparison of Industry Classification Schemes for Capital Market Research. Journal of Accounting Research 41, 745-774.

Block, S.B., 1999. A Study of Financial Analysts: Practice and Theory. Financial Analysts Journal 55, 86-95.

Boatsman, J., Baskin, E., 1981. Asset Valuation with Incomplete Markets. Accounting Review 56, 38-53.

Bonadurer, W., 2003. Valuation by Multiples. Doctoral seminar paper, University of St.Gallen.

Bradshaw, M.T., 2002. The Use of Target Prices to Justify Sell-Side Analysts' Stock Recommendations. Accounting Horizons 16, 27-41.

Bradshaw, M.T., 2004. How Do Analysts Use Their Earnings Forecasts in Generating Stock Recommendations? Accounting Review 79, 25-50.

Brealy, R.A., Myers, S.C., 2000. Principles of Corporate Finance, 6th edition. McGraw-Hill, New York, NY.

Burgstahler, D.C., 1998. Discussion of "Combining Earnings and Book Value in Equity Valuation." Contemporary Accounting Research 15, 325-341.

Carter, R.B., Van Auken, H.E., 1990. Security analysis and portfolio management: A survey and analysis. Journal of Portfolio Management 16, 81-85.

Chan, L.K., Lakonishok, J., Sougiannis, T., 2001. The Stock Market Valuation of Research and Development Expenditures. Journal of Finance 56, 2431-2456.

Chang, J., 1999. The decline in value relevance of earnings and book values. Working paper, University of Pennsylvania.

Cheng, C.S.A., McNamara, R., 2000. The Valuation Accuracy of the Price-Earnings and Price-Book Benchmark Valuation Methods. Review of Quantitative Finance and Accounting 15, 349-370.

Cochrane, J.H., 2005. Writing Tips for Ph.D. Students. Working paper, University of Chicago.

Coenenberg, A.G., Schultze, W., 2002. Das Multiplikator-Verfahren in der Unternehmensbewertung: Konzeptionen und Kritik. Finanz Betrieb 12, 697-703.

Collins, D.W., Maydew, E.L., Weiss, I.S., 1997. Changes in the value-relevance of earnings and book values over the past forty years. Journal of Accounting and Economics 24, 39-67.

Copeland, T., Koller, T., Murrin, J., 2000. Valuation: Measuring and Managing the Value of Companies, 3rd edition. Wiley, Hoboken, NJ.

Copeland, T., Weston, J.F., Shastri, K., 2004. Financial Theory and Corporate Policy, 4th edition. Addison-Wesley, Boston, MA.

Damodaran, A., 2001. The Dark Side of Valuation: Valuing Old Tech, New Tech, and New Economy Companies. FT Prentice Hall, Upper Saddle River, NJ. Manuscript provided by the author, http://www.damodaran.com, April 04, 2006.

Damodaran, A., 2002. Investment Valuation: Tools and Techniques for Determining the Value of Any Asset. Wiley, Hoboken, NJ. Manuscript provided by the author, http://www.damodaran.com, April 04, 2006.

Damodaran, A., 2006. Damodaran on Valuation, 2nd edition. Wiley, Hoboken, NJ. Manuscript provided by the author, http://www.damodaran.com, April 04, 2006.

Datastream, 1996. Datatype definitions. http://www.thomson.com/financial, February 22, 2006.

DeAngelo, L.E., 1990. Equity Valuation and Corporate Control. Accounting Review 65, 93-112.

Dechow, P.M., Hutton, A.P., Sloan, R.G., 1999. An empirical assessment of the residual income valuation model. Journal of Accounting and Economics 26, 1-34.

Demirakos, E.G., Strong, N.C., Walker, M., 2004. What Valuation Models Do Analysts Use? Accounting Horizons 18, 221-240.

Dow Jones, 2006. Dow Jones STOXX 600: Factsheet. http://www.stoxx.com, September 02, 2006.

Easton, P.D., Harris, T., 1991. Earnings as an Explanatory Variable for Returns. Journal of Accounting Research 29, 19-36.

Easton, P.D., 2004a. Discussion of Forward Versus Trailing Earnings in Equity Valuation. Review of Accounting Studies 9, 330-336.

Easton, P.D., 2004b. PE Ratios, PEG Ratios, and Estimating the Implied Expected Rate of Return on Equity Capital. Accounting Review 79, 73-95.

Eberhart, A.C., 2001. Comparable firms and the precision of equity valuations. Journal of Banking and Finance 25, 1367-1400.

Eberhart, A.C., 2004. Equity Valuation Using Multiples. Journal of Investing 13, 48-54.

Eberhart, A.C., Maxwell, W.F., Siddique, A.R., 2004. An Examination of Long-Term Abnormal Stock Returns and Operating Performance Following R&D Increases. Journal of Finance 59, 623-650.

Eccles, G.E., Herz, R.H., Keegan, E.M., Phillips, D.M.H., 2002. The Value Reporting Revolution: Moving Beyond the Earnings Game, German edition. Wiley, Weinheim, Germany.

Edwards, E.O., Bell, P.W., 1961. The Theory and Measurement of Business Income. University of California Press, Berkeley, CA.

Esty, B.C., 2000. What Determines Comparability When Valuing Firms With Multiples? Journal of Financial Education 2, 24-33.

Evans, F.C., Bishop, D.M., 2001. Valuation for M&A: Building Value in Private Companies. Wiley, Hoboken, NJ.

Fahrmeir, L., Künstler, R., Pigeot, I., Tutz, G., 1999. Statistik: Der Weg zur Datenanalyse, 2nd edition. Springer, Berlin, Germany.

Fairfield, P.M., 1994. P/E, P/B and the Present Value of Future Dividends. Financial Analysts Journal 50, 23-31.

Fama, E.F., 1970. Efficient Capital Markets: A Review of Theory and Empirical Work. Journal of Finance 25, 383-417.

Fama, E.F., 1976. Foundations of Finance. Basic Books, New York, NY.

Fama, E.F., 1991. Efficient Capital Markets: II. Journal of Finance 46, 1575-1617.

Fama, E.F., 1998. Market efficiency, long-term returns, and behavioral finance. Journal of Financial Economics 49, 283-306.

Fama, E.F., French, K.R., 1992. The Cross-section of Expected Stock Returns. Journal of Finance 47, 427-466.

Fama, E.F., French, K.R., 1993. Common risk factors in the returns on stocks and bonds. Journal of Financial Economics 33, 3-56.

Fama, E.F., French, K.R., 1995. Size and Book-to-Market Factors in Earnings and Returns. Journal of Finance 50, 131-156.

Fama, E.F., French, K.R., 1997. Industry Costs of Equity. Journal of Financial Economics 43, 153-193.

Fama, E.F., French, K.R., 1998. Value versus Growth: The International Evidence. Journal of Finance 53, 1975-1999.

Feltham, G.A., Ohlson, J.A., 1995. Valuation and Clean Surplus Accounting for Operating and Financial Activities. Contemporary Accounting Research 11, 689-731.

Fernández, P., 2002. Valuation Methods and Shareholder Value Creation. Academic Press, San Diego, CA.

Francis, J., Schipper, K., 1999. Have Financial Statements Lost Their Relevance? Journal of Accounting Research 37, 319-352.

Francis, J., Schipper, K., Vincent, L., 2003. The Relative and Incremental Explanatory Power of Earnings and Alternative (to Earnings) Performance Measures for Returns. Contemporary Accounting Research 20, 121-164.

Frankel, R., Lee, C.M.C., 1998. Accounting valuation, market expectation, and cross-sectional stock returns. Journal of Accounting and Economics 25, 283-319.

Frykman, D., Tolleryd, J., 2003. Corporate Valuation: An Easy Guide to Measuring Value. FT Prentice Hall, Upper Saddle River, NJ.

Geddes, R., 2003. IPOs and Equity Offerings. Butterworth-Heinemann, Burlington, MA.

Gibson, C.H., 1998. Financial Statement Analysis: Using Accounting Information, 8th edition. South-Western, Cincinnati, OH.

Gilson, S.C., Hotchkiss, E.S., Ruback, R.S., 2000. Valuation of bankrupt firms. Review of Financial Studies 13, 43-74.

Gjesdal, F., 2004. A Steady State Growth Valuation Model: A Note on Accounting and Valuation. Working paper, Norwegian School of Economics and Business, Bergen.

Goedhart, M., Koller, T., Wessels, D., 2005. The right role for multiples in valuation. McKinsey on Finance 15, 7-11.

Gode, D., Ohlson, J.A., 2006. A Unified Valuation Framework for Dividends, Free-Cash Flows, Residual Income, and Earnings Growth Based Models. Working paper, New York University, Arizona State University.

Gordon, M., 1962. The Investment, Financing, and Valuation of the Corporation. Irwin, Homewood, IL.

Guenther, D.A., Rosman, A.J., 1994. Difference between Compustat and CRSP SIC Codes and Related Effects on Research. Journal of Accounting and Economics 18, 115-128.

Guo, R.-J., Lev, B., Shi, C., 2006. Explaining the Short- and Long-Term IPO Anomalies by R&D. Journal of Business Finance and Accounting 33, 550-579.

Hand, J.R.M., 1999. Profits, Losses, and the Stock of Internet Firms. Working paper, University of North Carolina at Chapel Hill.

Hand, J.R.M., 2000. The Role of Economic Fundamentals, Web Traffic, and Supply and Demand in the Pricing of US Internet Stocks. Working paper, University of North Carolina at Chapel Hill.

Harrington, D.R., 2004. Corporate Financial Analysis in a Global Environment, 7th edition. Thomson South-Western, Mason, OH.

Herrmann, V., 2002. Marktpreisschätzung mit kontrollierten Multiplikatoren. Josef Eul Verlag, Cologne, Germany.

Herrmann, V., Richter, F., 2003. Pricing with Performance-Controlled Multiples. Schmalenbach Business Review 55, 194-219.

I/B/E/S International, 2000. The I/B/E/S Glossary: A Guide to Understanding I/B/E/S Terms and Conventions. http://www.thomson.com/financial, February 22, 2006.

ICB, 2004. Product Specification ICB Universe Data Services. http://www.icbenchmark.com, January 27, 2006.

Ittner, C.D., Larcker, D.F., 1998. Are Nonfinancial Measures Leading Indicators of Financial Performance? An Analysis of Customer Satisfaction. Journal of Accounting Research 36, 1-35.

Jensen, M.C., 1986. Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. American Economic Review 76, 323-329.

Johnson, L.T., Petrone, K.R., 1998. Commentary: Is Goodwill an Asset? Accounting Horizons 12, 293-303.

Kahle, K.M., Walkling, R.A., 1996. The Impact of Industry Classifications on Financial Research. Journal of Financial and Quantitative Analysis 31, 309-335.

Kaplan, S.N., Ruback, R.S., 1995. The Valuation of Cash Flow Forecasts: An Empirical Analysis. Journal of Finance 50, 1059-1093.

Kaplan, S.N., Ruback, R.S., 1996. The Market Pricing of Cash Flow Forecasts: Discounted Cash Flow vs. the Method of Comparables. Journal of Applied Corporate Finance 8, 45-60.

Kim, M., Ritter, J.R., 1999. Valuing IPOs. Journal of Financial Economics 53, 409-437.

Kothari, S.P., 2001. Capital markets research in accounting. Journal of Accounting and Economics 31, 105-231.

Koller, T., Goedhart, M., Wessels, D., 2005. Valuation: Measuring and Managing the Value of Companies, 4th edition. Wiley, Hoboken, NJ.

Krolle, S., Schmitt, G., Schwetzler, B., editors, 2005. Multiplikatorverfahren in der Unternehmensbewertung: Anwendungsberichte, Problemfälle, Lösungsalternativen. Schäffer-Poeschel, Stuttgart, Germany.

Lee, C.M.C., 1996. Measuring wealth. CA Magazine 129, 32-37.

Lee, C.M.C., Myers, J., Swaminathan, B., 1999. What Is the Intrinsic Value of the Dow? Journal of Finance 54, 1693-1741.

Lev, B., 1989. On the Usefulness of Earnings and Earnings Research: Lessons and Directions from Two Decades of Empirical Research. Journal of Accounting Research 27, 153-192.

Lev, B., 2001. Intangibles: Management, Measurement, and Reporting. Brookings, Washington, DC.

Lev, B., Sougiannis, T., 1996. The capitalization, amortization, and value-relevance of R&D. Journal of Accounting and Economics 21, 107-138.

Lev, B., Nissim, D., Thomas, J.K., 2002. On the usefulness of R&D capitalization and amortization. Working paper, New York University, Columbia University, Yale University.

Lie, E., Lie, H.J., 2002. Multiples Used to Estimate Corporate Value. Financial Analysts Journal 58, 44-54.

Liu, J., Thomas, J.K., 2000. Stock Returns and Accounting Earnings. Journal of Accounting Research 38, 71-101.

Liu, J., Nissim, D., Thomas, J.K., 2002a. Equity Valuation Using Multiples. Journal of Accounting Research 40, 135-172.

Liu, J., Nissim, D., Thomas, J.K., 2002b. International equity valuation using multiples. Working paper, UCLA, Columbia University, Yale University.

Liu, J., Nissim, D., Thomas, J.K., 2005a. Cash flow is King? Comparing valuations based on cash flow versus earnings multiples. Working paper, UCLA, Columbia University, Yale University.

Liu, J., Nissim, D., Thomas, J.K., 2005b. Value relevance of cash flows versus earnings: an international analysis using multiples. Working paper, UCLA, Columbia University, Yale University.

Loderer, C., Jörg, P., Pichler, K., Zgraggen, P., 2005. Handbuch der Bewertung: Praktische Methoden und Modelle zur Bewertung von Projekten, Unternehmen und Strategien, 3rd edition. NZZ Verlag, Zurich.

Löhnert, P.G., Böckmann, U.J., 2005. Multiplikatorverfahren in der Unternehmensbewertung. In Peemoeller, V.H., editor. Praxishandbuch der Unternehmensbewertung, 3rd edition, 403-428. Verlag Neue Wirtschafts-Briefe, Berlin, Germany.

Lundholm, R., Sloan, R.G., 2004. Equity Valuation and Analysis with eVal. McGraw-Hill, New York, NY.

Lynch, P., 2000. One Up on Wall Street. Simon and Schuster, New York, NY.

Marshall, A., 1898. Principles of Economics, 4th edition. Macmillan, London, UK.

Miller, M.H., Modigliani, F., 1961. Dividend Policy, Growth and the Valuation of Shares. Journal of Business 34, 411-433.

Mintzberg, H., Lampel, J., Ahlstrand, B., 1998: Strategy Safari: A Guided Tour Through The Wilds of Strategic Management. Free Press, New York, NY.

Modigliani, F., Miller, M.H., 1958. The Cost of Capital, Corporation Finance, and the Theory of Investment. American Economic Review 48, 261-297.

Modigliani, F., Miller, M.H., 1963. Corporate Income Taxes and the Cost of Capital: A Correction. American Economic Review 53, 433-443.

Moxter, A., 1983. Grundsätze ordnungsgemässer Unternehmensbewertung, 2nd edition. Gabler, Wiesbaden, Germany.

Mueller, G.G., Gernon, H., Meek, G, 1994. Accounting: An International Perspective. Irwin, New York, NY.

Müller-Stewens, G., Lechner, C., 2001. Strategisches Management: Wie strategische Initiativen zum Wandel führen, Der St.Galler Management Navigator. Schäffer-Poeschel, Stuttgart, Germany.

Myers, S.C., 1977. Determinants of Corporate Borrowing. Journal of Financial Economics 5, 147-175.

Myers, S.C., 1984. The Capital Structure Puzzle. Journal of Finance 39, 575-592.

Nelson, J.M., 2006. Intangible Assets, Book-to-Market, and Common Stock Returns. Journal of Financial Research 29, 21-41.

Nissim, D., Penman, S.H., 2001. Ratio Analysis and Equity Valuation: From Research to Practice. Review of Accounting Studies 6, 109-154.

O'Hanlon, J., Peasnell, K.V., 2002. Residual Income and Value-Creation: The Missing Link. Review of Accounting Studies 7, 229-245.

Ohlson, J.A., 1995. Earnings, Book Values, and Dividends in Equity Valuation. Contemporary Accounting Research 11, 661-687.

Ohlson, J.A., 2002. Discussion of "Residual Income and Value-Creation: The Missing Link." Review of Accounting Studies 7, 247-251.

Ohlson, J.A., 2005. On Accounting-Based Valuation Formulae. Review of Accounting Studies 10, 323-347.

Ohlson, J.A., Juettner-Nauroth, B., 2005. Expected EPS and EPS Growth as Determinants of Value. Review of Accounting Studies 10, 349-365.

Palepu, K.G., Healy, P.M., Bernard, V.L., 2000. Business Analysis and Valuation Using Financial Statements, 2nd edition. South-Western, Cincinnati, OH.

Peasnell, K.V., 1981. On capital budgeting and income measurement. Abacus 17, 52-67.

Peasnell, K.V., 1982. Some formal connections between economic values and yields and accounting numbers. Journal of Business, Finance and Accounting 9, 361-381.

Peemöller, V. H., Kunowski, S., Hillers, J., 1999. Ermittlung des Kapitalisierungszinssatzes für internationale Mergers and Acquisitions bei Anwendung des Discounted Cash Flow Verfahrens. Die Wirtschaftsprüfung 52, 621-630.

Penman, S.H., 1996. The Articulation of Price-Earnings Ratios and Market-to-Book Ratios and the Evaluation of Growth. Journal of Accounting Research 34, 235-259.

Penman, S.H., 1998. Combining Earnings and Book Value in Equity Valuation. Contemporary Accounting Research 15, 291-324.

Penman, S.H., 2004. Financial Statement Analysis and Security Valuation, 2nd edition. McGraw-Hill, New York, NY.

Penman, S.H., 2006. Handling Valuation Models. Journal of Applied Corporate Finance 18, 48-55.

Penman, S.H., Sougiannis, T., 1998. A Comparison of Dividend, Cash Flow, and Earnings Approaches to Equity Valuation. Contemporary Accounting Research 15, 343-383.

Pereiro, L.E., 2002. Valuation of Companies in Emerging Markets: A Practical Approach. Wiley, Hoboken, NJ.

Pfeil, O.P., 2003. The Valuation of Intellectual Capital. Working paper, MIT, University of St.Gallen.

Pfeil, O.P., 2004. Earnings from Intellectual Capital as a Driver of Shareholder Value. Haupt, Bern, Switzerland.

Pratt, S., 2005. The Market Approach to Valuing Businesses, 2nd edition. Wiley, Hoboken, NJ.

Pratt, S., Reilly, R., Schweihs, R., 2000. Valuing a Business, 3rd edition. Irwin, Homewood, IL.

Preinreich, G.A.D., 1938. Annual survey of economic theory: The theory of depreciation. Econometrica 6, 219-241.

Rappaport, A., 1981. Selecting strategies that create shareholder wealth. Harvard Business Review 59, 139-149.

Richter, F., 2005. Mergers and Acquisitions: Investmentanalyse, Finanzierung und Prozessmanagement. Vahlen, Munich, Germany.

Ross, S.A., 1977. Determination of Financial Structure: The Incentive Signaling Approach. Bell Journal of Economics 8, 23-40.

Ross, S.A., Westerfield, R.W., Jaffe, J., 2002. Corporate Finance, 6th edition. McGraw-Hill, New York, NY.

Smith, C.W., 1986. Investment Banking and the Capital Acquisition Process. Journal of Financial Economics 15, 3-29.

Smith, C.W., Ikenberry, D., Nayar, A., Anda, J., McVey, M., Stewart, G.B., 2005. Morgan Stanley Roundtable on Capital Structure and Payout Policy. Journal of Applied Corporate Finance 17, 36-54.

Spremann, K., 2002. Finanzanalyse und Unternehmensbewertung. Oldenbourg, Munich, Germany.

Spremann, K., 2004. Valuation: Grundlagen moderner Unternehmensbewertung. Oldenbourg, Munich, Germany.

Spremann, K., 2005. Modern Finance, 2nd edition. Oldenbourg, Munich, Germany.

Spremann, K., 2006. Portfoliomanagement, 3rd edition. Oldenbourg Munich, Germany. Manuscript provided by the author.

Stahel, W. A., 2002. Statistische Datenanalyse: Eine Einführung für Naturwissenschaftler, 4th edition. Vieweg, Braunschweig, Germany.

Standard & Poor's, 2006. S&P 500: Factsheet. http://www.standardandpoors.com, September 02, 2006.

Stewart, G.B., 1991. The Quest for Value. Harper Business, New York, NY.

Suozzo, P., Cooper, S., Sutherland, G., Deng, Z., 2001. Valuation Multiples: A Primer. Research report, UBS Investment Bank.

Tasker, S.C., 1998. Industry-preferred Multiples in Acquisition Valuation. Working paper, Cornell University.

Thomas, J.K., Zhang, H., 2004. Another look at P/E ratios. Working paper, Yale University, University of Hong Kong.

Thomson Financial, 2003. Worldscope Database: Datatype Definitions Guide. http://www.thomson.com/financial, February 22, 2006.

Trueman, B., Wong, M.H.F., Zhang, X.-J., 2000. The Eyeballs Have It: Searching for the Value in Internet Stocks. Journal of Accounting Research 38, 137-162.

Trueman, B., Wong, M.H.F., Zhang, X.-J., 2001. Back to Basics: Forecasting the Revenues of Internet Firms. Review of Accounting Studies 6, 305-329.

Von Berenberg-Consbruch, J., 2006. Industriespezifische Multiples in der Unternehmensbewertung: eine empirische Untersuchung für den europäischen Aktienmarkt. Master thesis, University of St.Gallen.

White, G.I., Sondhi, A.C., Fried, D., 2003. The Analysis and Use of Financial Statements, 3rd edition. Wiley, Hoboken, NJ.

Williams, J., 1938. The Theory of Investment Value. Harvard University Press, Cambridge, MA.

Yee, K.K., 2004. Forward Versus Trailing Earnings in Equity Valuation. Review of Accounting Studies 9, 301-329.