Table 2 (continued)

Global Telecommunications Services — Summary Operating Comparisons [a]

Economy	Spain Telef Esp	Netherlands KPN	Denmark TeleDan	Hong Kong HK Tel	Singapore Sing Tel	Philippines PLDT	Thailand TA	Malaysia TelMalaysia	USA Airtouch
Financials	Pesetas (bn)	Guilders (m)	Kroner (m)	$HK (m)	$S (m)	Peso (m)	Baht (m)	Ringgit (m)	$US(m)
Population Growth	0.2%	0.7%	0.1%	-0.2%	1.5%	2.4%	1.7%	2.6%	1.0%
GDP Growth (88-93)	2.28%	2.72%	1.08%	3.92%	7.56%	1.86%	9.04%	8.50%	1.30%
GDP Growth 94E	0.5%	0.7%	2.4%	5.3%	7.7%	4.5%	8.3%	8.4%	3.7%
GDP/Capita ($US)	15,314	21,767	27,938	16,621	17,534	830	2,037	3,180	NM
GDP/Capita Index to US	64.83%	92.15%	118.27%	70.36%	74.22%	3.52%	8.62%	13.46%	NM
Inflation CPI Growth '93	4.60%	2.60%	1.30%	10.70%	2.30%	8.00%	3.30%	3.70%	3.00%
Long Bond (or equiv)	11.19%	7.92%	9.49%	8.40%	70.00%	13.00%	10.50%	6.75%	7.63%
Growth									
Access Line GR 93	3.34%	3.18%	1.83%	6.11%	6.50%	16.77%	200.00%	15.27%	NM
Cell Subs GR 93	42.71%	30.12%	55.29%	29.00%	50.00%	85.96%	NM	8.43%	39.96%
5YR Revenue Growth	4.40%	7.14%	6.00%	13.83%	11.66%	10.20%	57.20%	14.53%	14.81%
5YR EPS GR	9.90%	14.96%	25.70%	16.00%	16.00%	12.00%	73.82%	19.00%	42.63%
3YR CE GR	7.20%	9.66%	12.30%	15.27%	10.45%	10.09%	148.00%	16.20%	22.73%
Telco									
GDP/Access Line ($US)	40,390	42,080	46,507	31,015	36,972	38,225	348,259	22,821	NM
GDP/Cellular Sub ($US)	2,333,657	1,536,806	447,183	979,000	275,667	566,805	NM	682,222	5,819,857
National Wireline Penetration	36.35%	50.03%	59.19%	50.80%	43.99%	2.08%	0.51%	12.49%	50.73%
National Cellular Penetration	0.66%	1.35%	5.62%	4.85%	5.23%	0.11%	0.58%	1.61%	6.21%
Digital Switching 93 (%)	86%	93%	NA	100%	80%	78%	NA	NA	NM
Regulatory									
Rebalancing Program [b]	1	1	1	1	1	0	1	0	NM
Pricing Framework (c)	1	1	1	1	1	0	0	1	NM
Competition [d]	1	2	2	2	0	2	3	0	NM
Regulatory Environment Index [e]	3	4	4	4	2	2	4	1	NA
Efficiency									
Lines(Cell. Subs)/Employee	191.61	238.58	181.66	186.55	167.11	70.24	188.44	79.87	NA
Revenue/Line (Cell. Sub) 93	636.60	1,182.69	783.24	1,050.03	1,411.85	539.27	53.11	605.07	944.55
Cash Op Ex/Line (Cell. Sub)	271.62	745.55	572.34	614.20	598.10	263.57	92.32	231.00	655.45
Revenue/Employee	121.98	95.68	142.28	195.89	161.92	37.88	10.01	48.33	NA
Net Inc. 93/Telco Employee	10.11	9.80	15.26	60.97	62.32	9.46	23.87	12.99	NA
ROE 93	6.95%	14.81%	19.42%	51.42%	23.04%	15.31%	4.30%	12.92%	1.69%
ROE 95E	8.65%	17.67%	27.77%	56.65%	33.54%	13.56%	20.51%	15.82%	4.98%
Financial Strength									
LTDebt/Cap	43.02%	30.02%	48.12%	0.00%	0.00%	35.38%	30.95%	9.69%	0.00%
Net Debt/Equity	103.56%	32.64%	102.79%	-8.79%	-67.84%	63.22%	44.81%	8.44%	9.41%
Free Cash/CapEx 93	1.06%	36.51%	108.52%	-5.47%	120.28%	-35.13%	-87.41%	-39.59%	-7.61%
Debt Rating	AA	n/r	n/r	A	AA+	BB-	n/r	NA	NA

(a) *Amounts in US Dollars, unless otherwise noted.*
(b) *Rebalancing program. 1=Rebalancing initiatives in place; 0=No rebalancing initiatives.*
(c) *Pricing framework: 0=Rate of return; 1=Price caps; 2=No pricing restrictions.*
(d) *Competition : 0=Monopoly with competitor within 5 years; 1=Monopoly with competitors within 2 years; 2=One competitor; 3=2-3 competitors; 4=Open competition*
(e) *Regulatory Environmental Index 0=unfavorable; 7=very favorable.*

E = Morgan Stanley Research Estimates. First Call consensus estimates for TeleDan and TA.
NM = Not Meaningful *NA = Not Applicable* *n/r = Not Rated*

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Table 2 *(continued)*

Global Telecommunications Services — Summary Operating Comparisons [a]

Economy	New Zealand NZ Tel	Korea Korea Mob	Japan NTT	Mexico Telmex	Mexico Iusacell	Brazil Telebras	Argentina Telefonica	Argentina Telecom	Chile CTC
Financials	$NZ (m)	Won (m)	Yen (bn)	N Pesos (m)	N Pesos (m)	$US (m)	Arg. Peso (m)	Arg. Peso (m)	Ch. Peso (m)
Population Growth	0.9%	1.0%	0.4%	2.0%	2.0%	2.1%	1.3%	1.3%	1.6%
GDP Growth (88-93)	2.90%	5.00%	1.50%	3.10%	3.10%	0.30%	2.58%	2.58%	5.68%
GDP Growth 94E	2.9%	6.6%	0.7%	2.4%	2.4%	2.8%	3.8%	3.8%	4.5%
GDP/Capita ($US)	12,747	7,104	30,788	3,837	3,837	2,541	7,747	7,747	2,923
GDP/Capita Index to US	53.96%	30.07%	130.33%	16.24%	16.24%	10.76%	32.80%	32.80%	12.37%
Inflation: CPI Growth '93	1.30%	4.80%	0.90%	9.80%	9.80%	2104.00%	10.60%	10.60%	12.70%
Long Bond (or equiv)	9.23%	12.50%	4.41%	13.77%	13.77%	18.80%	16.00%	16.00%	18.80%
Growth									
Access Line GR 93	3.85%	NM	2.69%	12.84%	NM	7.85%	10.20%	12.24%	18.46%
Cell Subs GR 93	43.51%	73.52%	21.39%	34.02%	10.90%	NA	97.80%	97.80%	69.00%
5YR Revenue Growth	0.17%	66.57%	1.80%	15.07%	51.67%	18.09%	23.60%	22.21%	13.90%
5YR EPS GR	10.27%	45.00%	-4.92%	15.00%	57.88%	12.00%	24.00%	19.00%	19.00%
5YR CE GR	3.81%	60.46%	0.28%	15.38%	43.17%	15.79%	36.34%	25.48%	17.15%
Telco [a]									
GDP/Access Line ($US)	26,748	NM	67,078	46,018	NM	41,120	63,542	63,542	28,111
GDP/Cellular Sub ($US)	304,937	663,735	3,742,502	876,750	876,750	13,534,000	5,777,778	5,777,778	NA
National Wireline Penetration	46.31%	NM	45.90%	8.34%	NM	6.18%	6.60%	5.60%	10.40%
National Cellular Penetration	2.96%	0.87%	1.61%	0.44%	0.44%	0.16%	0.34%	0.34%	0.58%
Digital Switching 93 (%)	96%	NM	100%	65%	NM	24%	38%	54%	100%
Regulatory									
Rebalancing Program [b]	1	1	1	1	1	1	1	1	1
Pricing Framework [c]	1	2	0	0	0	0	1	1	1
Competition [d]	3	4	2	2	3	0	1	1	2
Regulatory Environment Index [e]	5	7	3	3	4	1	3	3	4
Efficiency									
Lines(Cell. Subs)/Employee	172.09	238.16	236.48	121.01	NA	110.21	122.30	120.12	159.68
Revenue/Line (Cell. Sub) 93	880.93	1,123.45	1,129.86	1,039.14	221.73	624.06	810.09	794.43	599.14
Cash Op Ex/Line (Cell. Sub)	400.15	554.48	581.71	391.64	1636.54	232.12	443.71	464.68	286.64
Revenue/Employee	151.59	267.56	267.19	125.75	NA	68.78	99.07	95.43	95.67
Net Inc. 93/Telco Employee	34.42	48.60	1.73	42.03	NA	14.26	16.61	12.55	23.27
ROE 93	23.59%	31.04%	0.92%	25.55%	1.70%	7.12%	11.55%	10.40%	18.28%
ROE 95E	NA	38.23%	NA	30.15%	4.70%	3.60%	18.11%	15.50%	21.18%
Financial Strength									
LTDebt/Cap	34.62%	0.00%	42.31%	12.82%	NA	6.46%	6.53%	24.92%	40.80%
Net Debt/Equity	76.13%	0.00%	73.86%	18.06%	14.21%	14.82%	9.52%	36.40%	79.99%
Free Cash/CapEx 93	44.25%	-57.76%	-224.85%	22.86%	NA	144.63%	-46.55%	-56.81%	-42.00%
Debt Rating	Aa+	NA	NA	BBB	NA	n/r	BB-	BB-	BBB+

(a) Amounts in US Dollars, unless otherwise noted.
(b) Rebalancing program: 1=Rebalancing initiatives in place; 0=No rebalancing initiatives.
(c) Pricing framework: 0=Rate of return; 1=Price caps; 2=No pricing restrictions.
(d) Competition: 0=Monopoly with competitor within 5 years; 1=Monopoly with competitors within 2 years; 2=One competitor; 3=2-3 competitors; 4=Open competition.
(e) Regulatory Environmental Index: 0=unfavorable; 7=very favorable.

E = Morgan Stanley Research Estimates. First Call consensus estimates for NTT, NZ Tel, and Iusacell.
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Table 3

Global Telecommunications Services — Summary Valuation Comparisons [a]

	USA RHC+GTE	Multinational Millicom	Canada BCE	UK BT	UK C & W	UK Vodafone	Italy Tel. Italia	Italy STET
Liquidity								
Firm Mkt Cap ($USm)	181,650	1,060	11,118	36,422	14,754	7,767	24,479	18,888
Company Mkt. Cap ($USm)	180,072	1,032	10,728	33,823	12,938	8,828	22,835	15,883
Public Float as % of Mkt Cap	100%	61%	100%	96%	100%	100%	39%	39%
Public Float/Local Market Cap	7.16%	0.03%	6.64%	4.61%	1.95%	1.02%	10.99%	8.48%
Valuation								
Local share price (p/c) [b]	NM	NM	48.13	3.65	3.99	1.96	4475.00	4835.00
Local share price (p/c) [a]	NM	23.00	35.84	5.76	6.31	3.09	2.88	3.19
ADR/US share price (p/c)	43.27	23.00	36.13	58.50	19.13	31.13	NM	NM
Shares per ADR/ADS	NYSE	NASDAQ	NYSE	10	3	10	NM	NM
Firm Val/Acc Line (Sub)	1,808.18	35,692.26	1,980.21	1,367.33	NA	7,784.09	785.49	526.86
Price/Book (NAV)	2.71	10.99	1.53	1.74	2.65	8.46	1.48	0.91
EPS 93 ($US))	2.78	0.77	2.81	0.42	0.38	0.12	0.07	0.13
EPS 94E ($US)	3.03	0.39	2.38	0.38	0.38	0.13	++	++
EPS 95E ($US)	3.13	0.21	2.69	0.44	0.43	0.16	++	++
P/E 93	14.27	29.87	12.92	12.80	15.66	24.10	35.80	22.29
P/E 94E	13.52	58.97	15.25	14.07	15.71	22.77	++	++
P/E 95E	12.64	109.52	13.52	12.19	13.76	18.19	++	++
Relative P/E 93	0.84	1.76	0.44	0.73	0.89	1.37	0.61	0.38
Relative P/E 94E	0.92	4.01	0.90	0.91	1.02	1.48	++	++
Relative P/E 95E	1.01	8.76	1.06	0.91	1.03	1.36	++	++
P/CE 93	5.51	26.14	4.10	5.76	8.52	18.17	3.76	2.29
P/CE 94E	5.25	35.92	NA	6.01	8.21	16.59	++	++
P/CE95E	4.95	38.71	NA	5.65	7.34	14.37	++	++
Relative P/CE 93	0.56	2.67	0.41	0.58	0.86	1.84	0.48	0.29
Relative P/CE 94E	0.58	3.99	NA	0.69	0.94	1.91	++	++
Dividend Yield	5.46%	0.00%	6.12%	5.74%	2.59%	1.79%	1.89%	2.20%
Relative Yield	2.0	0.0	2.4	1.6	6.7	0.5	1.3	1.6
Adj Total Return [c]	4.46%	22.47%	2.19%	3.77%	9.52%	12.71%	++	++

(a) Amounts in U.S. dollars, unless otherwise noted
(b) In local currency
(c) Adjusted Total Return: Five-year estimated EPS growth plus current dividend yield less local long bond rate

E = Morgan Stanley Research Estimates. First Call consensus estimate for BCE.
NM = Not Meaningful NA = Not Applicable
++ Estimates for this company have been removed from consideration in this report because under applicable law Morgan Stanley & Co. Incorporated may be precluded from issuing such information with respect to this company at this time.

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Table 3 *(continued)*

Global Telecommunications Services — Summary Valuation Comparisons [a]

	Spain Telef. Esp	Netherlands KPN	Denmark TeleDan	Hong Kong HK Tel	Singapore Sing Tel	Philippines PLDT	Thailand TA	Malaysia TelMalaysia	USA Airtouch
Liquidity									
Firm Mkt Cap ($USm)	11,546	12,242	3,120	22,658	33,032	3,330	8,011	13,311	10,281
Company Mkt Cap ($USm)	12,066	12,856	3,207	22,658	32,255	2,794	8,979	14,938	14,652
Public Float as % Mkt Cap	68%	30%	49%	28%	11%	33%	10%	8%	100%
Public Float/Local Market Cap	9.69%	2.69%	5.55%	2.97%	7.06%	5.27%	1.23%	0.85%	0.41%
Valuation									
Local share price (p/c) [b]	1740.00	52.40	333.00	15.70	3.32	1460.00	102.00	20.20	29.75
Local share price (p/c) [a]	13.58	30.25	54.87	2.03	2.24	56.05	4.10	7.87	29.75
ADR/US share price (p/c)	40.75	NM	27.00	20.00	NM	58.25	NM	NM	29.75
Shares per ADR/ADS	3	NM	0.5	10	NM	1	NM	NM	NM
Firm Val/Acc Line (Sub)	890.70	1,904.20	1,521.30	7,388.69	26,476.93	2,635.24	28,412.92	6,568.00	12,218.55
Price/Book (NAV)	1.16	1.92	2.41	11.20	20.66	2.26	9.00	4.83	3.83
EPS 93 ($US))	0.72	2.01	3.63	0.09	0.04	3.30	0.02	0.23	0.09
EPS 94E ($US)	0.80	2.25	2.83	0.10	0.05	3.79	0.05	0.24	0.23
EPS 95E ($US)	0.88	2.71	3.60	0.11	0.06	3.88	0.10	0.24	0.36
P/E 93	16.86	13.44	13.49	23.17	50.38	15.99	213.70	33.11	370.45
P/E 94E	15.22	11.99	17.30	20.55	42.73	13.91	88.35	30.61	129.35
P/E 95E	13.81	9.94	13.62	17.82	36.73	13.59	39.98	30.61	82.64
Relative P/E 93	1.01	0.81	0.66	1.42	2.05	0.72	9.71	1.35	21.79
Relative P/E 94E	1.03	0.84	0.94	1.71	1.86	0.61	4.37	1.26	8.80
Relative P/E 95E	1.02	0.80	0.85	1.76	1.92	0.76	2.37	1.49	6.61
P/CE 93	3.42	4.61	4.16	19.40	39.01	11.07	173.07	21.40	61.24
P/CE 94E	3.17	4.46	3.58	17.06	34.03	9.46	67.83	16.59	47.94
P/CE95E	2.94	4.04	3.19	14.78	29.51	8.75	31.28	14.19	37.31
Relative P/CE 93	0.53	0.63	0.45	1.37	2.64	NA	NA	NA	6.25
Relative P/CE 94E	0.54	0.68	0.43	NA	NA	NA	NA	NA	5.33
Dividend Yield	3.51%	3.72%	3.50%	3.25%	0.38%	0.43%	0.00%	0.51%	0.00%
Relative Yield	0.9	1.1	2.1	1.2	0.3	1.1	0.0	0.4	0.0
Adj Total Return [a]	2.22%	10.77%	19.71%	10.85%	-53.62%	-0.57%	63.32%	12.76%	35.00%

(a) Amounts in U.S. dollars, unless otherwise noted
(b) In local currency
(c) Adjusted Total Return: Five-year estimated EPS growth plus current dividend yield less local long bond rate

E = Morgan Stanley Research Estimates First Call consensus estimates for TeleDan and TA.
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Table 3 *(continued)*

Global Telecommunications Services — Summary Valuation Comparisons *(a)*

	New Zealand NZ Tel	Korea Korea Mob	Japan NTT	Mexico Telmex	Mexico Iusacell	Brazil Telebras	Argentina Telefonica	Argentina Telecom	Chile CTC
Liquidity									
Firm Mkt Cap ($USm)	5,437	1,872	137,700	34,199	2,789	11,458	7,404	5,463	3,819
Company Mkt Cap ($USm)	5,575	3,278	134,815	33,281	2,789	15,106	7,875	6,477	3,321
Public Float as % Mkt Cap	50%	57%	30%	67%	10%	42%	40%	40%	44%
Public Float/Local Market Cap	16.65%	1.24%	2.53%	19.77%	0.24%	9.13%	10.45%	7.71%	6.27%
Valuation									
Local share price (p/c) (b)	5.25	478000.00	888000.00	10.54	10.00	53.00	6.68	6.58	1650.00
Local share price (p/c) (a)	3.17	596.34	9015.05	3.10	2.94	61.63	6.88	6.58	4.00
ADR/US share price (p/c)	49.75	NM	NM	63.00	30.00	60.25	70.13	14.63	88.25
Shares per ADR/ADS	16	NM	NM	20	10	1	1	1	17
Firm Val/Acc Line (Sub)	5,088.50	7,027.23	2,454.85	4,527.41	21,091.67	1,631.38	3,560.61	3,796.17	2,867.39
Price/Book (NAV)	6.01	9.30	3.05	3.02	4.78	9.08	2.94	3.36	2.77
EPS 93 ($US))	0.13	17.18	100.38	0.27	0.01	1.97	0.255	0.20	0.26
EPS 94E ($US)	0.14	27.43	NA	0.30	0.00	2.11	0.325	0.26	0.28
EPS 95E ($US)	0.16	42.59	NA	0.35	0.04	3.13	0.397	0.32	0.32
P/E 93	23.09	34.44	86.10	12.41	455.04	15.97	26.20	33.01	15.78
P/E 94E	20.70	21.58	80.46	10.35	1115.42	35.62	18.35	28.73	12.91
P/E 95E	19.03	13.89	NA	8.42	74.07	27.76	13.05	18.64	11.09
Relative P/E 93	1.48	1.65	0.88	0.71	25.85	0.63	1.32	1.66	0.70
Relative P/E 94E	1.42	1.07	0.91	0.64	69.28	1.67	1.25	1.95	0.69
Relative P/E 95E	1.51	0.82	NA	0.66	5.79	1.72	1.11	1.58	0.66
P/CE 93	12.19	21.59	6.00	9.38	44.88	2.90	12.22	12.11	9.54
P/CE 94E	NA	8.97	NA	8.04	46.76	2.49	8.93	10.65	8.29
P/CE95E	NA	5.58	NA	6.62	24.33	5.68	6.71	7.97	7.18
Relative P/CE 93	NA	NA	0.51	NA	NA	NA	NA	NA	NA
Relative P/CE 94E	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dividend Yield	3.28%	0.11%	0.04%	1.47%	0.00%	0.00%	1.89%	1.74%	3.05%
Relative Yield	NA	NA	NA	NA	NA	NA	NA	NA	NA
Adj Total Return (c)	4.32%	32.61%	-9.29%	2.70%	44.11%	-6.80%	9.89%	4.74%	3.25%

(a) Amounts in U.S. dollars, unless otherwise noted
(b) In local currency
(c) Adjusted Total Return: Five-year estimated EPS growth plus current dividend yield less local long bond rate

E = Morgan Stanley Research Estimates First Call consensus estimates for NTT and Iusacell.
NA = Not Applicable NM= Not Meaningful

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Valuation Approach: Statistical Analysis as a Comparative Tool

In this our first cut at a comparative analysis of telephone companies around the world, we have purposefully chosen to be less conclusive and more exploratory in our approach. Specifically, we suspected it would be interesting to consider a range of operating data and see what correlated best to current valuations. Moreover, we expected it would help us to identify attractive investment opportunities.

Narrowing Down the Valuation Benchmarks

We decided to stick with relatively traditional valuation benchmarks as the independent variables for our regressions. Specifically, we focused on price-earnings ratios, price-to-cash earnings ratios, price-to-book values, and dividend yield.

We then narrowed our focus to four basic analyses using these valuation benchmarks:

Dividend Yield vs. EPS Growth In this comparison, we used current dividend yields and projected five-year estimated earnings per share growth. We expected to see an inverse relationship relative to growth rates (mature telephone companies, with lower growth rates, offer investors higher dividend yields). In addition, we would not be surprised if the more mature telephone companies would have a stronger correlation to valuation based on yield.

Price-Earnings vs. Earnings Growth Investors often are willing to pay a higher earnings multiple for higher estimated earnings growth. In this analysis, we focus on 1994E P/Es of the companies and five-year estimated earnings growth rates.

Price-to-Cash Earnings vs. Cash Earnings Growth This analysis is similar to the previous one. However, we use price-to-1994E cash earnings instead of price-earnings. We expect that cash earnings multiples are more appropriate when comparing telephone companies around the world with different accounting methods, especially in the treatment of depreciation. Cash earnings should reconcile some of these differences.

Price-to-Book vs. Return on Equity This comparison attempts to focus on what the market is willing to pay for a company's equity (price-to-book) versus the return a company is able to earn on its equity. We have used current price-to-book multiples and 1993 reported return on equity as the data for this analysis.

Defining the Company Groupings

We first looked at our telecom coverage universe as one large group. Therefore, each of the four comparative ratios described above was done for the entire group of companies. Our first observation was that we were getting relatively low levels of correlation when we included our coverage universe of companies. For instance, the r-squared, or predictive, factor ranged from a low of 25% for price-to-book vs. ROE to a high of 53% in the regression of price-earnings vs. EPS growth.

We expected that there might be some added value in dividing the companies into defined groups. Intuitively, we recognized that we could consider and analyze our coverage universe of telecom stocks in two separate groupings: emerging/growth telephone companies and mature telephone companies. Our delineation is based on the following:

Within the *emerging/growth telecom basket* we have placed telephone companies operating in an emerging market as well as companies in emerging growth industries.

- Emerging growth sectors for the purpose of this report include wireless, cellular, and paging. These represent industries that are typically posting revenue growth in excess of 25% annually.

- According to the IFC, all markets in developing countries are considered to be emerging. Economies are divided by the World Bank according to GDP per capita, with developing countries posting GDP per capita of $8,355 or less.

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The *mature telephone company basket* includes telephone companies in "high income markets" as defined by the World Bank, specifically those countries with annual GDP per capita in excess of $8,355.

In addition, we have provided a focused look at the *U.S. telephone companies* (Bell regional holding companies, independent telephone companies, and long distance carriers) by breaking them out into their own regressions. Table 4 outlines the groupings used throughout our analysis.

We should emphasize that any delineation criteria we employ will have exceptions, as some companies may fit more than one group or not neatly fit into a specific category. For instance, we believe that Hongkong Telecom and to some extent Singapore Telecom can be grouped in both emerging/growth telecom and mature telecom. For the purposes of these analyses, we have considered them in both baskets.

Table 4

Global Telephone Companies By Regression Grouping

Group	Emerg/Growth	Mature	US Telcos
ALL	Telebras	Bell RHCs	Ameritech
	CTC	GTE	Bell Atlantic
	Telmex	British Tel	BellSouth
	Telet Arg	Cable&Wireless	NYNEX
	Telecom Arg	Telefonica	Pacific Tel
	PLDT	KPN	SW Bell
	TelecomAsia	TeleDanmark	US West
	Tel Malaysia	BCE	Alltel
	Iusacell	NTT	Cinc Bell
	Vodaphone	NZ Telecom	South NE Tel
	Korea Mobile	*Singapore Tel*	Roch Tel
	Millicom	*HK Telecom*	GTE
	Singapore Tel		AT&T
	HK Telecom		MCI
			Sprint
			ALC

RHC = Bell regional holding company

Source: Company reports and Morgan Stanley estimates

Some General Observations

Table 5 provides a summary of the regression results, which, in fact, do indicate that by dividing the companies into subgroups we can gain deeper insight into appropriate valuation benchmarks, how the markets are approaching worldwide telephone companies, and finally some interesting opportunities represented by outliers in the graphs. We would summarize our observations as follows:

- The relationship between projected EPS growth and dividend yields is most pronounced in the *mature telephone companies* with a confidence factor of 81.5%. By contrast, emerging/growth telephone companies, with an r-squared of 22.2%, do not produce relationships that are as meaningful with this benchmark.

- In addition, the valuation of *mature telephone companies* works well on price-to-book versus ROE. The r-squared of 87% was the highest of all the regressions run. Intuitively, we would expect that the strong correlation reflects the highly regulated nature of the mature telephone companies' business and thus the importance of ROE as a measure of favorable regulatory status and/or higher levels of productivity.

- Correlations improve for the group of *emerging/growth* companies when we consider price-to-cash earnings versus cash earnings growth and price-earnings versus earnings per share growth. Given the importance of growth to these early-stage companies, which include wireless operators and companies in countries with low telephone penetration rates, we believe that the markets will continue to focus on these valuation benchmarks, and we would expect that over time the correlations will improve.

- The *U.S. telephone companies* demonstrate, on average, the most consistently strong correlations to all the valuation benchmarks, indicating a more efficient and homogenous approach by investors in valuing these companies. In particular, the U.S. telcos screened well using dividend yield to EPS growth as well as P/E to EPS growth. The least effective benchmark for valuation of the U.S. telco subset is cash earnings multiples vs. cash earnings growth, which illustrates that U.S. investors are still not comfortable with cash flow valuations of these companies and, despite the changing competitive landscape, still view these names on a yield and P/E basis.

Table 5

Regression Analysis Summary Table

	Group	Emerg/ Growth	Mature	U.S. Telco
Div Yield: EPS Growth	37.5%	22.2%	81.5%	79%
P/E: EPS Growth	53	47	8.6	79
P/CE: Cash Earn Growth	38	43	15	56
Price/Book:ROE	25	18	87	62

Figures represent r-squared values resulting from the regression analyses.

Source: Company reports and Morgan Stanley estimates.

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Tables 6 and 7 focus more specifically on the results of the various regressions. In Table 6 we summarize those companies that were positioned far enough from the regression line to be identified as potentially undervalued when compared with their global peers. Table 7 lists those companies that screen as fairly valued to overvalued.

Table 6

Summary of Stocks That Screen Undervalued On Various Regression Approaches

	Group	Emerg/ Growth	Mature	US Telcos
Dividend Yield: EPS Growth	BCE	HK Tel	**Telef Esp**	**Sprint**
	Bell RHCs	**CTC**	BCE	GTE
	Telef Esp	**Korea Mob**	**KPN**	**US West**
	TeleDanmark			**NYNEX**
	KPN			**Pacific Tel**
Price-Earnings: EPS Growth	Korea Mob	**Korea Mob**	**KPN**	**Pacific Tel**
	Telmex	**CTC**	TeleDanmark	**NYNEX**
	TeleDanmark	Vodaphone		**Sprint**
	Telef Arg	PLDT		Southern NE
		Telmex		**US West**
				GTE
Price/CE: Cash Earnings Growth	Korea Mob	**Korea Mob**	TeleDanmark	Cinc Bell
	Telef Arg	Telef Arg		**NYNEX**
	Tel Arg	Tele Arg	**Telef Esp**	Southern NE
	Telebras	**Telmex**		MCI
	BCE	Telebras		**Sprint**
	Telef Esp			
Price-to-Book: ROE	Telmex	**Telmex**	BT	GTE
	KPN	**CTC**	**KPN**	**Pacific Tel**
	BCE	PLDT	**Telef Esp**	**USW**
	TeleDanmark			Southern NE
	PLDT			**NYNEX**

Note: Companies in boldface appear in three or more categories.

Table 7

Summary of Stocks That Screen Fairly or Over-Valued on Various Regression Approaches

	Group	Emerg/ Growth	Mature	US Telcos
Dividend Yield : EPS Growth	Telebras	Telebras	**New Z Tel**	**AT&T**
	PLDT	PLDT	Cable&W'less	MCI
	Millicom	Millicom	**NTT**	**SW Bell**
	Sing Tel	**Sing Tel**		Ameritech
		Tel Malaysia		
Price-Earnings EPS Growth	Sing Tel	**Sing Tel**	**New Z Tel**	**AT&T**
	Telebras	Telebras	Tel Italia	Alltel
	Tel Malaysia	Millicom	**NTT**	**SW Bell**
	Millicom	Tel Asia		
	Tel Asia			
Price/CE: Cash Earnings Growth	Iusacell	Iusacell	Cable&W'less	Roc Tel
	Sing Tel	**Sing Tel**	British Tel	Ameritech
	Tel Asia	Tel Asia	Bell RHCs	**SW Bell**
			NTT	
Price-to-Book: ROE	Tel Asia	**Sing Tel**	**New Z Tel**	Sprint
	Telebras		**NTT**	Alltel
	Vodaphone			MCI
	Iusacell			Cinc Bell
				AT&T

Note: Companies in boldface appear in three or more categories.

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Making Some Sense of the Data

While Tables 5–7 summarize the results of our regressions, the following discussion provides a more detailed analysis of the various ratios studied. The format is a description of the regression results for the entire group followed by a look at the same analysis for each of the subgroupings, i.e., emerging/growth and mature telcos. In addition, we have provided a commentary on the U.S. telephone companies.

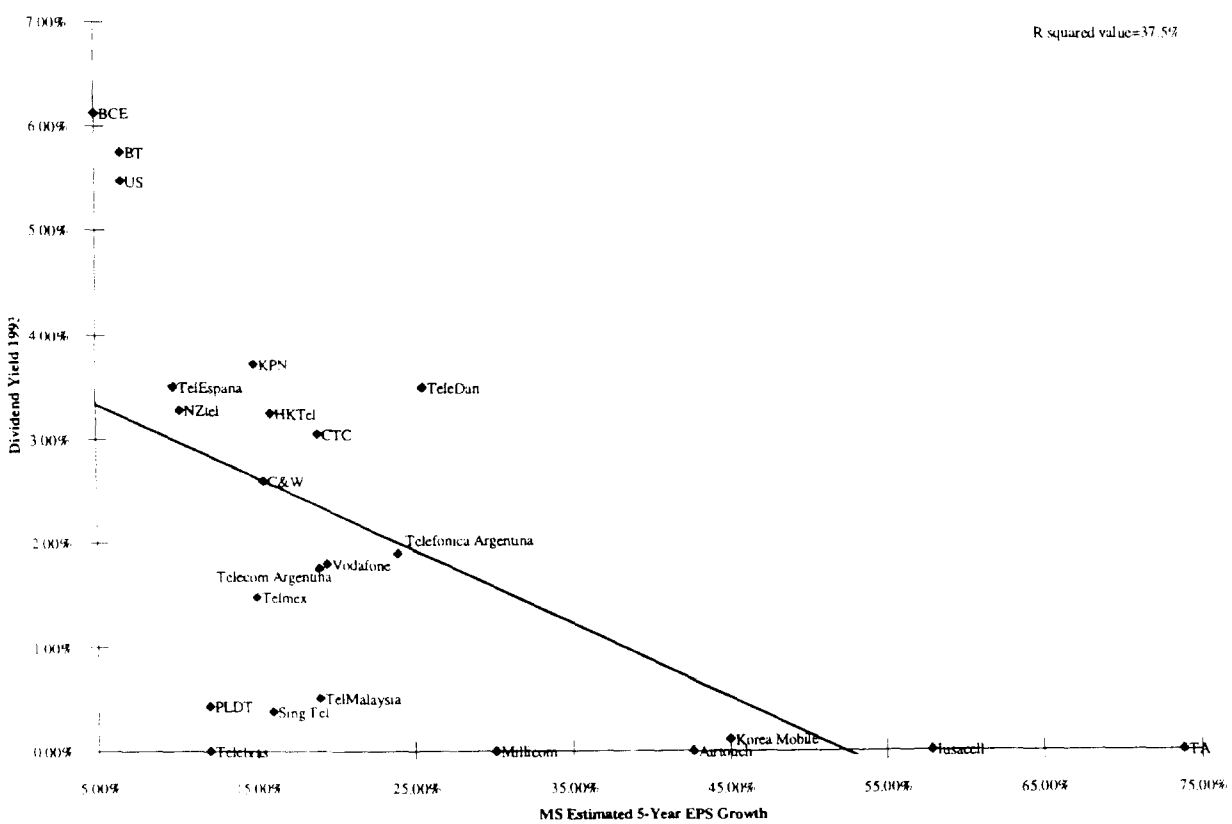
Dividend Yield vs. EPS Growth

Global Telecom Group When we plot the entire group of telephone companies, we find, not surprisingly, that the relationship is an inverse one, indicating that the higher the growth rate projected for a company, the lower the dividend yield. The r-squared of 37.5% implies that the relationship does not have a great deal of predictive power when we look at the entire group of companies (Figure 1).

In terms of the remaining outliers, it appears as though **TeleDanmark, KPN, Hongkong Telecom, CTC,** and the **Bell regional holding company group**, in particular, are offering yields that are attractive in relation to their growth rates. With earnings growth rates that are similar to those companies listed above, **Cable and Wireless, Telecom Argentina, Vodafone,** and **Telmex** are offering lower yields. Conversely, according to the analysis, **Singapore Telecom, Telebras, Telekom Malaysia,** and **PLDT,** for instance, have lower yields than their growth rates may suggest is necessary.

Figure 1

Global Telecom Group — Dividend Yield vs. EPS Growth



Source: Company reports and Morgan Stanley estimates.

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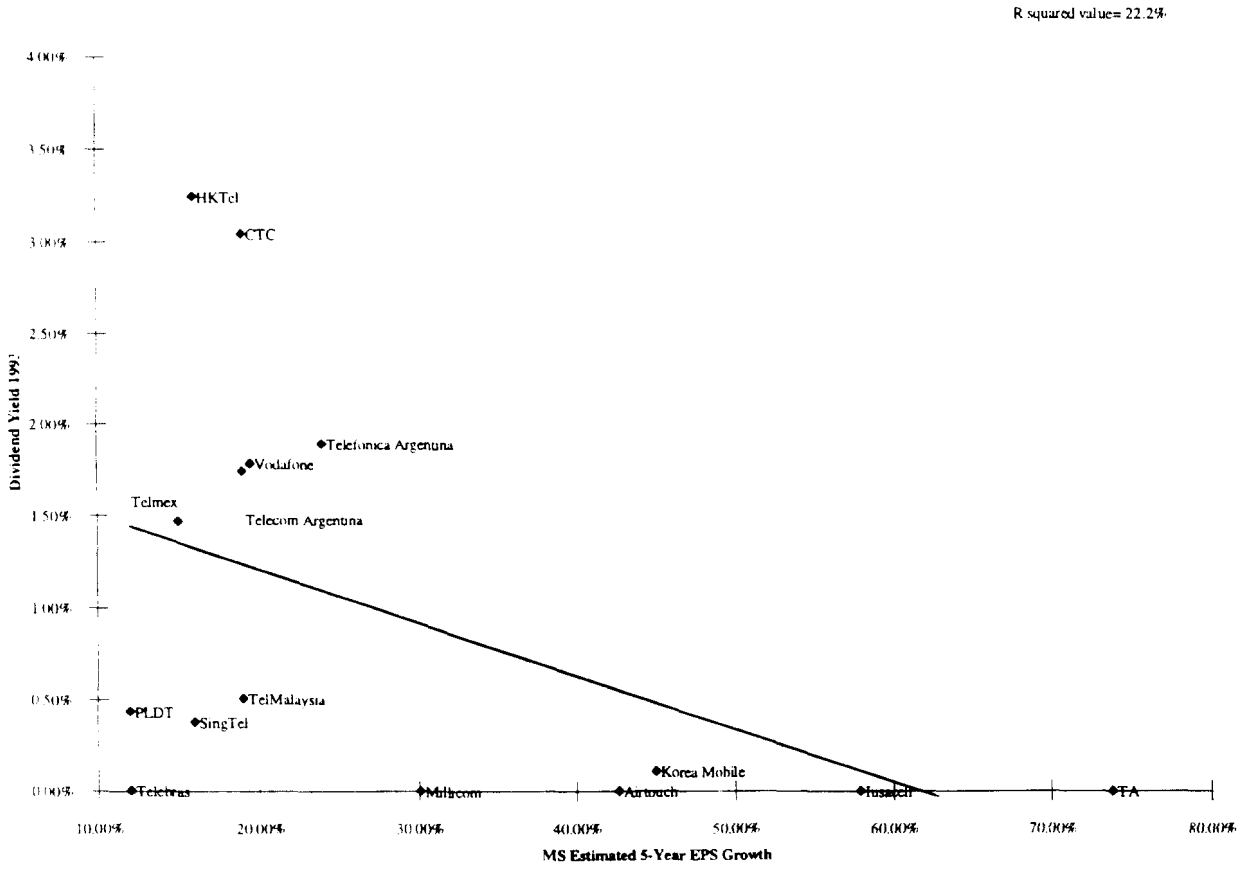
When we divide the companies into emerging/growth and mature baskets, we find that yield plays a dramatically different role as a valuation benchmark

Emerging/Growth Telephone Figure 2 suggests that yield is not a significant valuation benchmark for this set of companies. Clearly, these emerging/growth telecoms are at such early growth stages that investors are not focusing on dividend yield as a meaningful valuation benchmark. Interestingly, **Hongkong Telecom** and **CTC** stand out as dramatically undervalued compared to their emerging/growth peers. As we noted earlier, both these companies have operating characteristics that may resemble more of a hybrid of a mature telephone company and the emerging/growth telecoms.

Figure 2

Emerging/Growth Telecoms — Dividend Yield vs. EPS Growth



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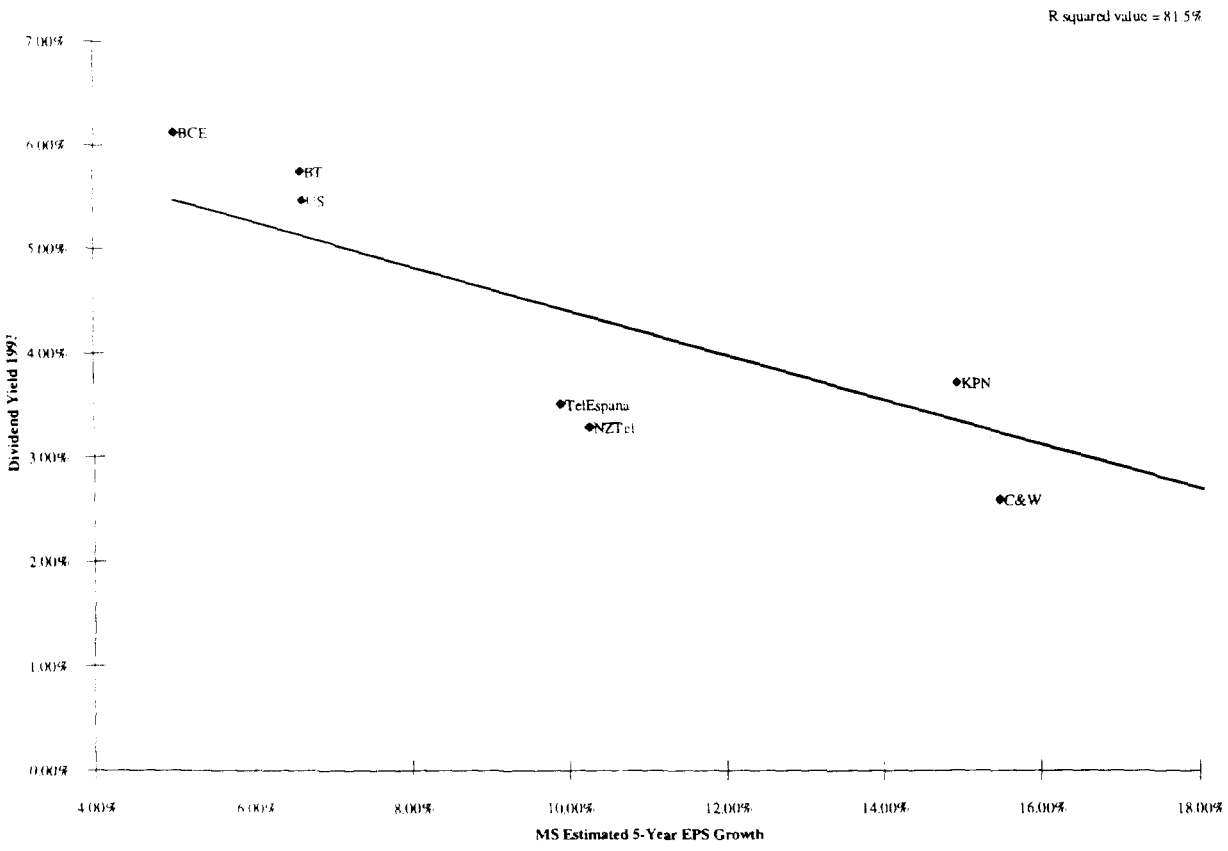
Mature Telephone By contrast, we found a high correlation (the confidence factor reached 81.5%) between dividend yield and projected earnings growth for the mature telephone companies. We removed **TeleDanmark** from the regression since it appeared to be a significant outlier, offering a high yield and high growth rate. If we include TeleDanmark, our r-squared declines to 63%.

Figure 3 illustrates that the companies are grouped closely around the regression line. Apparently, investors are accustomed to valuing the mature, monopoly providers of telephone service on a yield basis. The names divide neatly, with the **Bell RHCs, British Telecom,** and **KPN** all slightly undervalued on a yield basis. **Cable and Wireless, Telefonica Espana,** and **New Zealand Telecom** may be slightly overvalued.

Figure 3

Mature Telecoms — Dividend Yield vs. Growth



Source: Company reports and Morgan Stanley estimates

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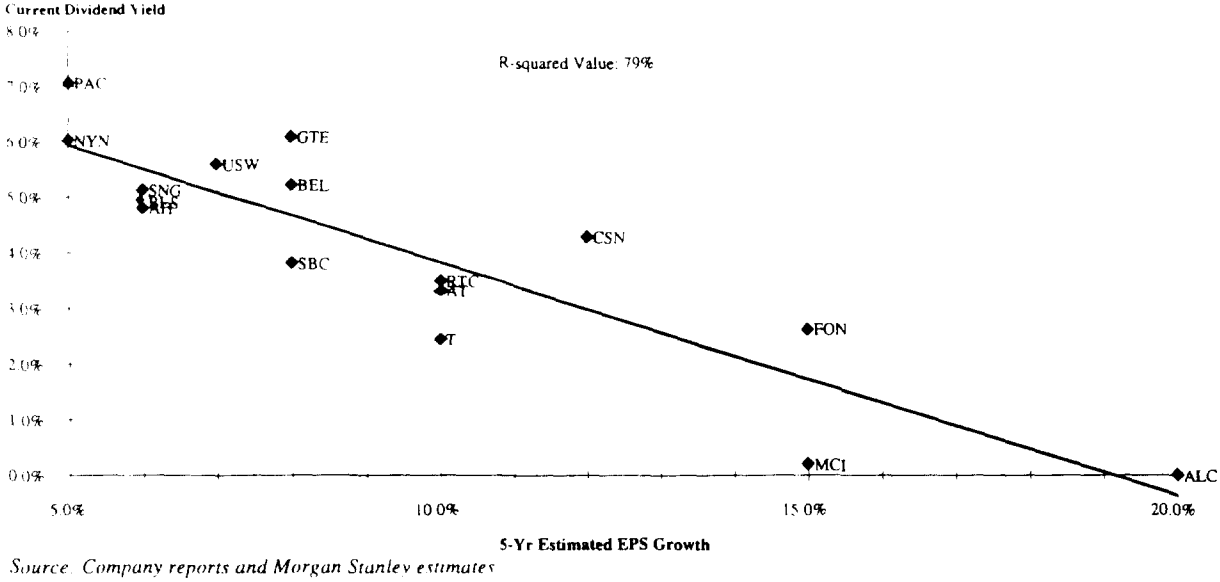
U.S. Telephone Companies Looking at Figure 4, we get a better sense of how U.S. telephone stocks are being valued. The correlation between five-year estimated EPS growth rates and dividend yield improves to provide an r-squared of 79% for these stocks. In addition to pointing out the value of using estimated earnings growth to help predict appropriate yield values, we can also point to the outliers as possible attractively valued names. For instance, it appears that **GTE, Sprint,** and **US West** offer yields above the necessary level suggested by their growth rates.

Figure 4

The U.S. Telcos — Dividend Yield vs. EPS Growth



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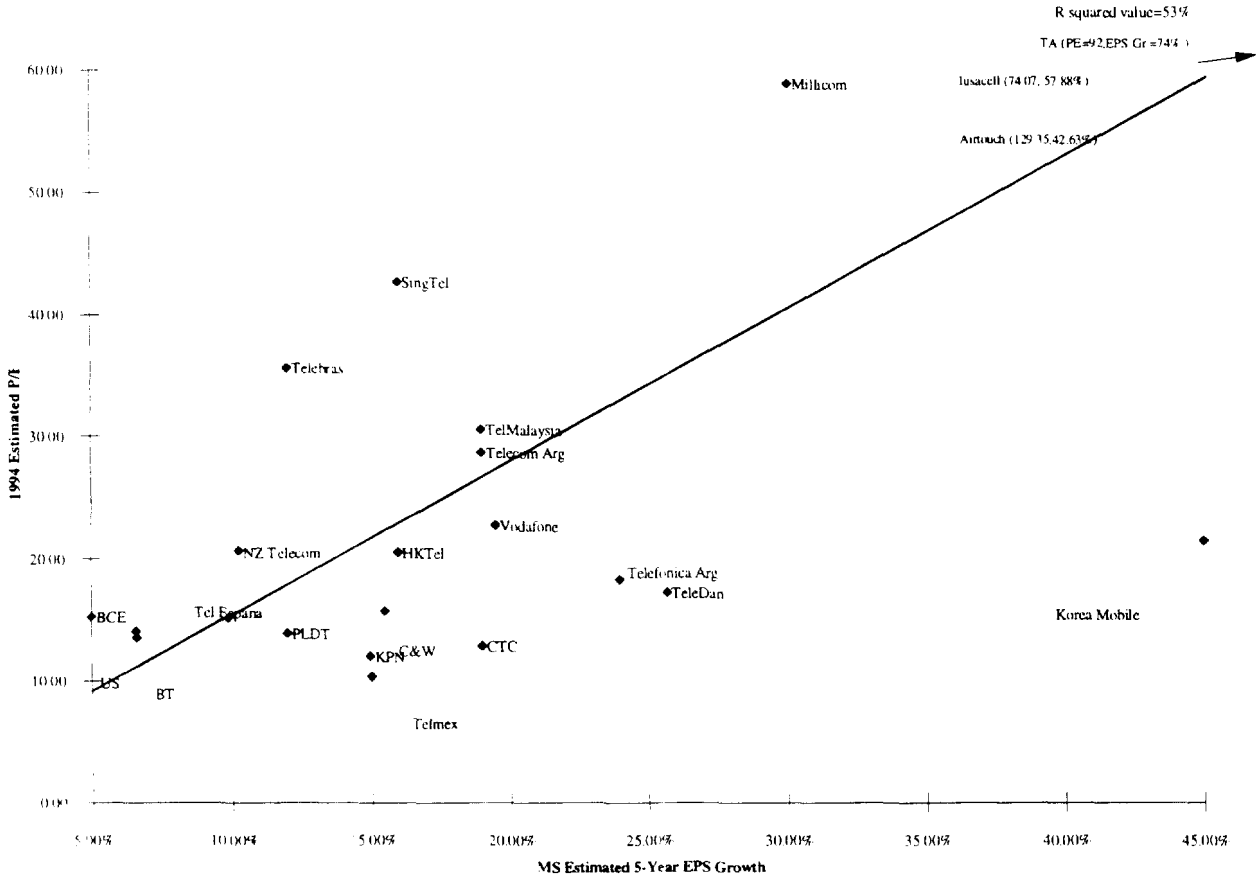
Price-Earnings vs. Earnings Growth

Global Telecom Group The correlation of price-earnings multiples to earnings per share growth is slightly higher for the entire group of companies than it was in the dividend yield versus EPS growth analysis. Our r-squared value in this relationship is 53% (Figure 5) The relationship indicates that the higher the earnings growth projected for the company, the higher the price-earnings multiple the market is willing to pay. Outliers include the wireless companies, such as **Iusacell**, **Airtouch**, and **Millicom**, which have generally much higher growth rates but lower earnings per share in their growth stages, thus very high earnings multiples. For these stocks, investors are apparently looking beyond current year estimated earnings in making valuation judgments.

Other outliers include **TeleDanmark, CTC,** and **Telmex**, which have multiples that are low given their growth rates. For **CTC** and **Telmex,** we expect that investors are factoring in some regulatory and competitive risks and are therefore less willing to pay a full multiple. Similarly for **TeleDanmark**, much of the near-term earnings growth appears to be emanating from cost reductions and efficiency improvement and may be relatively short-lived.

Figure 5

Global Telecom Group — Price-Earnings vs. EPS Growth



Source: Company reports and Morgan Stanley estimates

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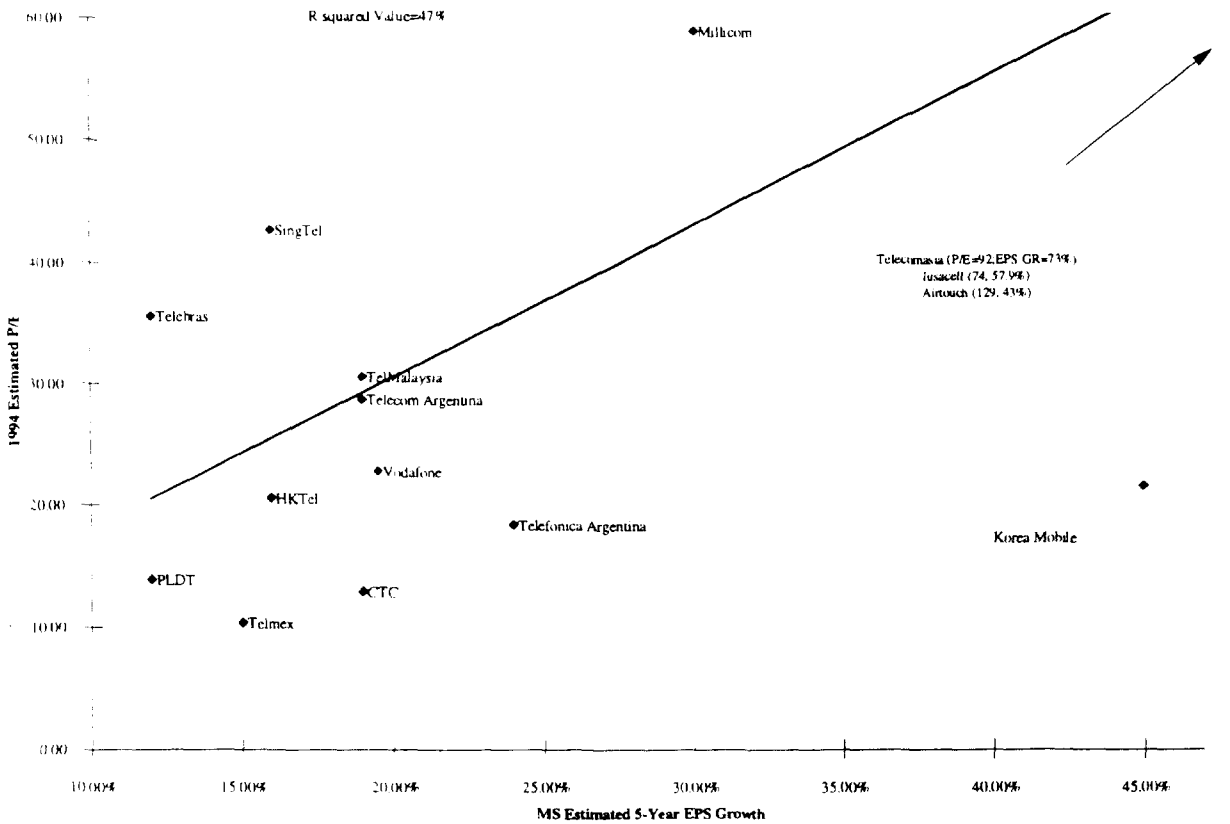
Focusing on the subgroupings, we can make the following observations:

Emerging/Growth Telecoms The confidence factor for the regression reached 47% — in line with the group correlation of 53% and indicating that this measure may be more meaningful for emerging/growth names than the mature telephone companies. Moreover, this analysis is certainly more appropriate for these higher growth companies than was the dividend yield analysis. Looking at specific names, **Singapore Telecom, Millicom,** and **Telebras** stand out as fairly overvalued, falling above the regression line in this relationship, whereas **Korea Mobile**, **Telmex, CTC,** and **Telefonica Argentina** appear undervalued relative to their growth rates.

Figure 6

Emerging/Growth Telecoms — Price-Earnings vs. EPS Growth



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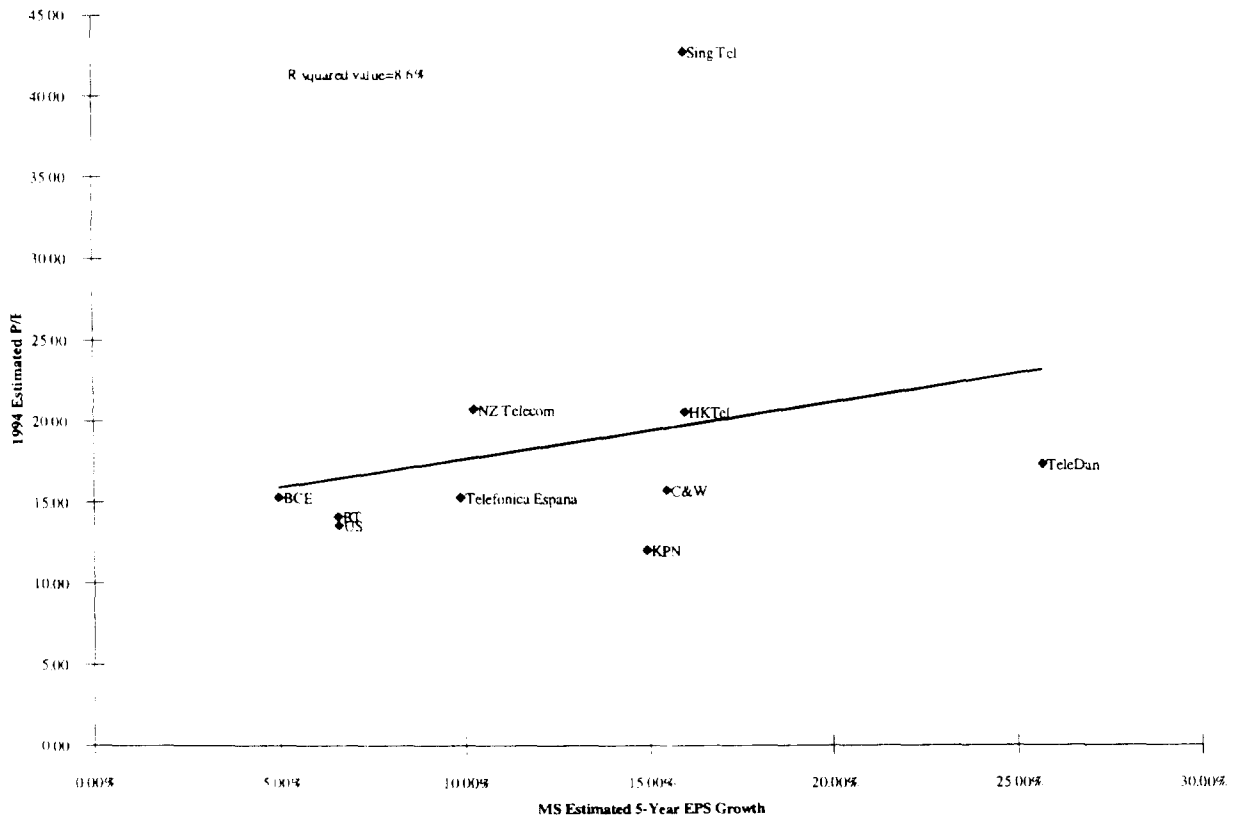
Mature Telephone Companies These companies have the lowest correlation on this valuation benchmark among the groups. The confidence factor value declines to 8.6% for these companies, and, as illustrated in Figure 7, the companies are scattered across the graph. It appears that much of the distortion is caused by the European telephone companies, which trade at wide variances to their respective EPS growth rates. The reason for this inside variance, we believe, has to do with the similarly wide range of P/E multiples for the respective local markets — from a multiple of 59 for Italy to a mere 16 for the Netherlands.

Figure 7

Mature Telecoms — Price-Earnings vs. EPS Growth



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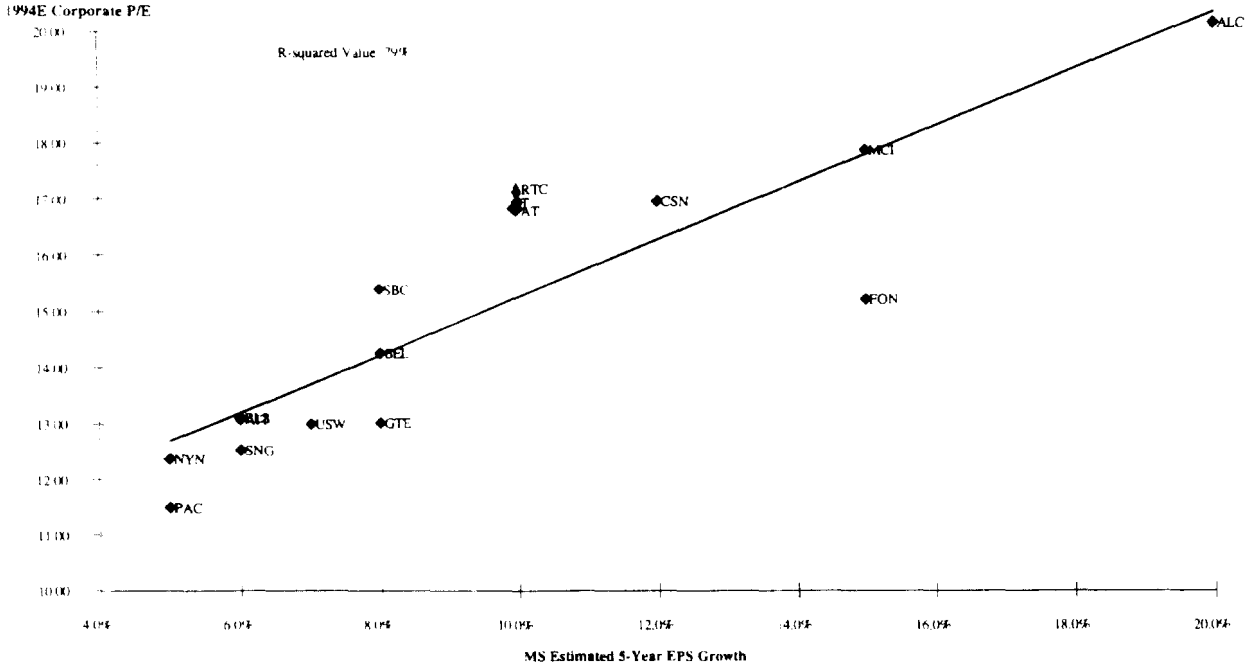
U.S. Telephone Companies When plotting just the U.S. telephone companies, the predictability of valuation using EPS growth is greater than with the broader group of mature telephone companies. This regression produces an r-squared value of 79%, the highest for this ratio. By looking at Figure 8, it is clear that most of the companies hover around the regression line. Notable outliers include **NYNEX, GTE,** and **Sprint,** which appear undervalued on this benchmark, while **Southwestern Bell** and **Rochester Telephone** appear to be adequately reflecting our estimated EPS growth in their P/E ratio.

Figure 8

The U.S. Telcos — Price-Earnings vs. EPS Growth



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Price-to-Cash Earnings vs. Cash Earnings Growth

Global Telecom Group We have also approached the global telephone companies by comparing the relationship of cash earnings multiples to cash earnings growth. Our expectation was that cash earnings, which adjusts for depreciation, would be a more comparable measure of operating results since it takes a step toward accommodating accounting differences.

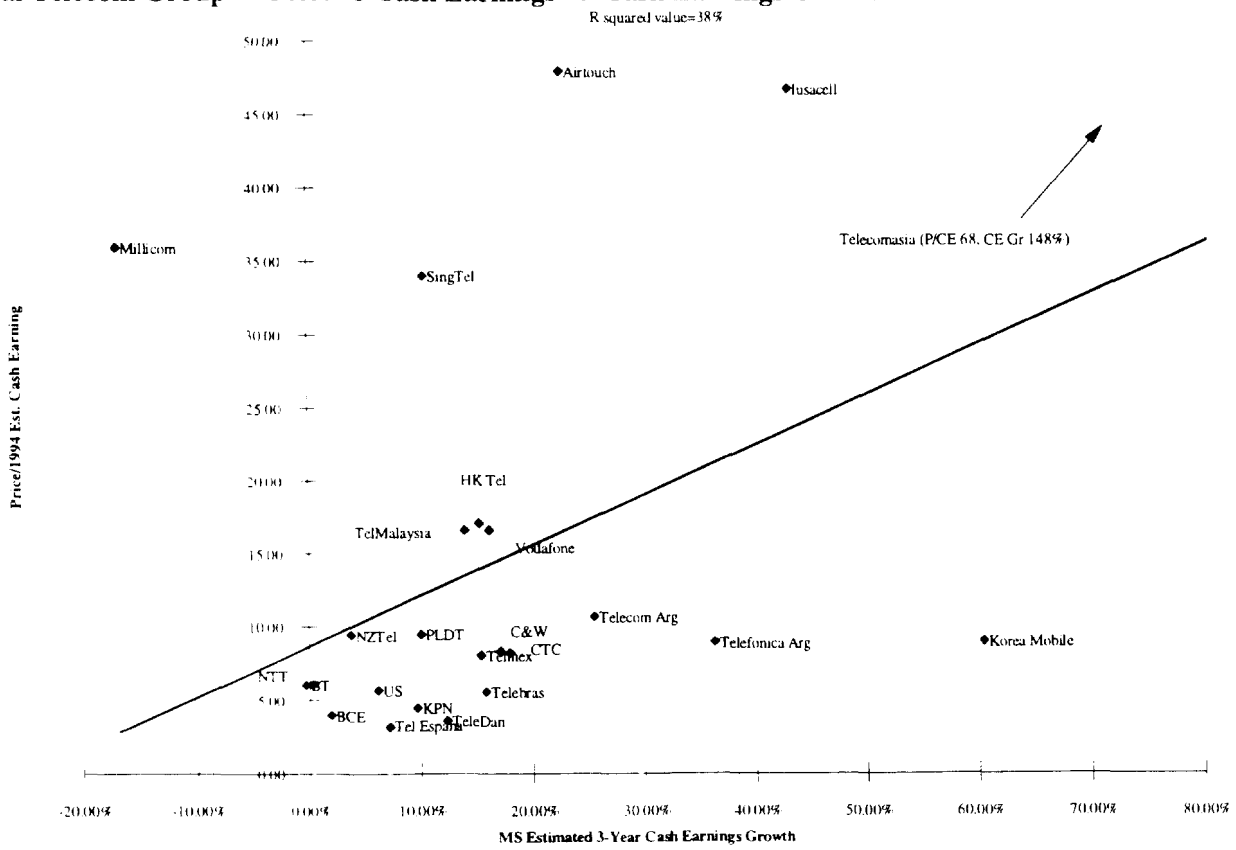
The relationship for our group was not as meaningful as the price-earnings vs. earnings growth comparison. Our r-squared for the group regression was 38%, compared with 53% for the price-earnings vs. earnings growth regressions.

The correlation for the U.S. telephone companies was the strongest of all the subgroups with an r-squared of 56%. Looking at the entire group in Figure 9, the North American, Latin American, and European companies consistently fell below the regression line, while the majority of the Far East telephone represented premium valuations. The most significant outliers include **Singapore Telecom,** which trades at one of the highest cash-earnings multiples but is projected to have one of the lowest growth rates of the emerging company group. **Iusacell, Airtouch,** and **Millicom** — wireless operators with significant losses due to the buildouts ahead of them — also screened as premium values on this benchmark.

Of the names below the regression line, **Telebras** and **Telefonica Argentina** represent two of the more undervalued companies. Also interesting is that, on a price-to-cash-earnings basis, **Telefonica Argentina,** and **Telecom Argentina** are more closely valued, whereas in the price-earnings analysis, the companies were not as consistently valued by the market. We believe this represents an accommodation for the differences in depreciation accounting, which is distorted in the price-earnings analysis.

Figure 9

Global Telecom Group — Price-to-Cash Earnings vs. Cash Earnings Growth



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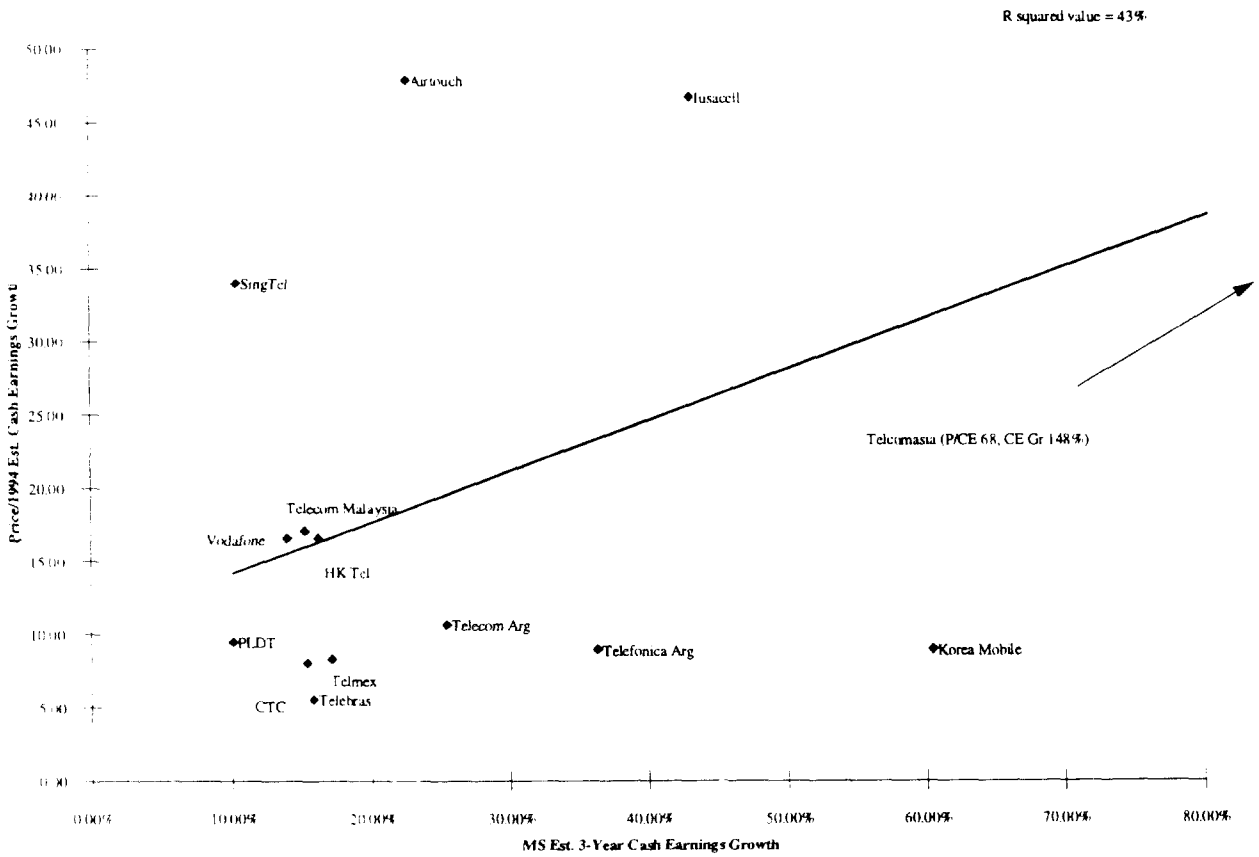
Highlighting the subgroup regressions, we would make the following observations:

Emerging/Growth Telecoms For the emerging/growth telecoms, the r-squared value improves from the group analysis to 43% (Figure 10). Again, the outliers are similar to those in the group regression and include **Iusacell, Airtouch,** and **Singapore Telecom**. **TelecomAsia**, interestingly enough, is not dramatically overvalued given its projected growth rate. The only wireless name that falls below the regression line is **Korea Mobile**, which, despite its relatively high projected growth rate, is trading at a cash-earning multiple comparable to those of **Telmex** and **CTC**.

The Latin American telephone companies appear attractive when compared with their peer group of emerging/growth names. In particular, **Telefonica Argentina** represents one of the more compelling values in this framework.

Figure 10

Emerging/Growth Telecoms
Price-to-Cash Earnings vs. Cash Earnings Growth



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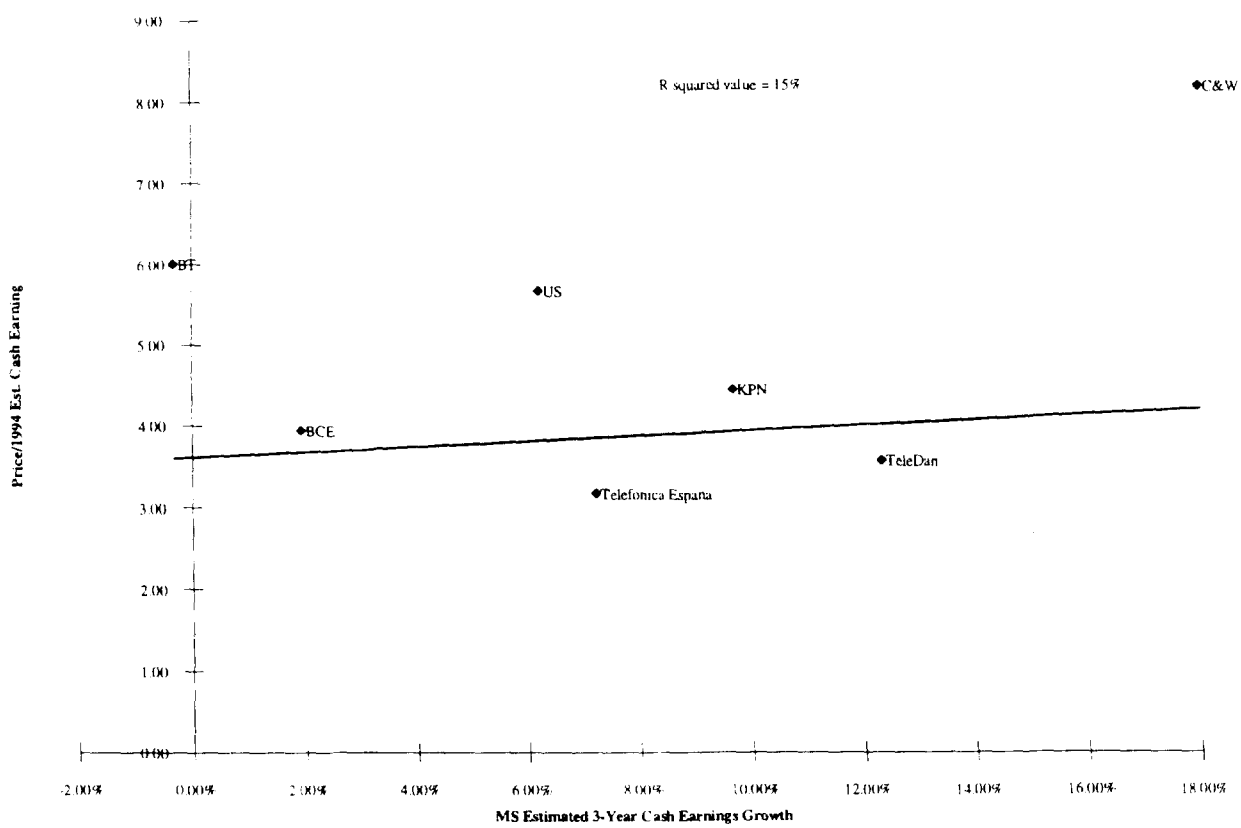
Mature Telephone Companies Switching gears to the mature telephone companies, cash-earnings valuations are not as consistent and therefore only yield a correlation of 15% — too low to be meaningful. As illustrated in Figure 11, **British Telecom** certainly appears to garner a premium value given its lackluster projected cash-earnings growth. **Telefonica Espana** appears interesting with a projected cash earnings growth rate in excess of the **Bell RHCs** but trading at a discount to the US telcos.

Figure 11

Mature Telecoms — Price-to-Cash Earnings vs. Cash Earnings Growth



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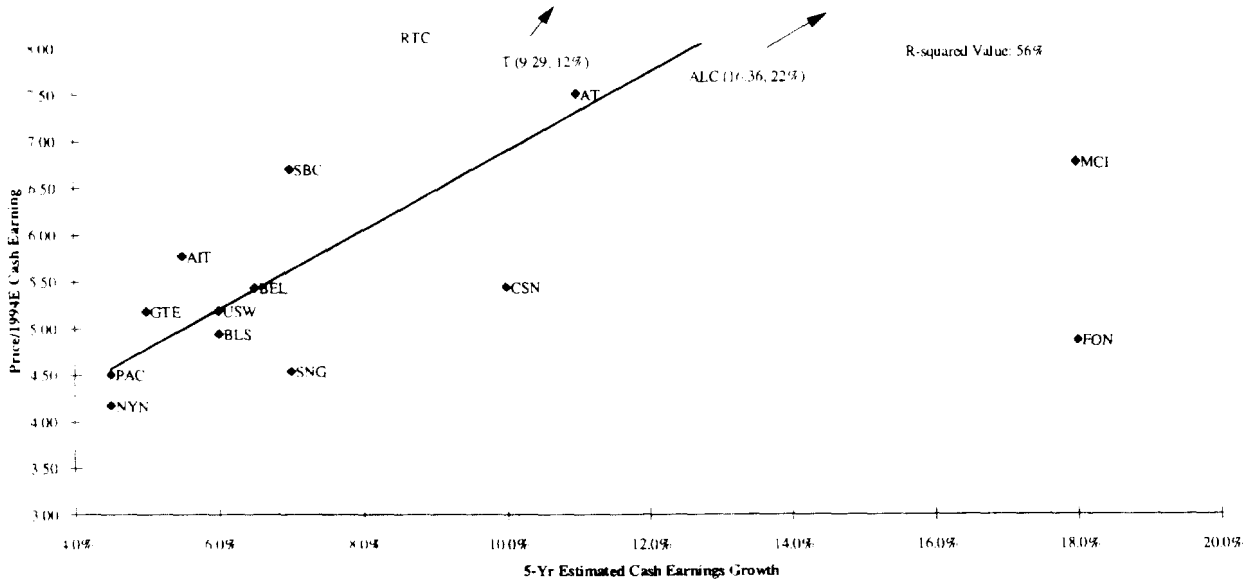
U.S. Telephone Companies Finally, by directing our focus strictly to the U.S. telephone companies, the correlation improves from that of the mature telcos. Our r-squared rises to 56%, still the lowest correlation of the four ratios for the U.S. telephone companies (Figure 12). Attractive names on this screen include **NYNEX, Cincinnati Bell,** and **Southern New England Telephone,** all of which trade at below-par cash-earnings multiples. Also interesting are the discount valuations given to **MCI** and **Sprint**.

Figure 12

The U.S. Telcos — Price-to-Cash Earnings vs. Cash-Earnings Growth



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Price-to-Book vs. Return on Equity

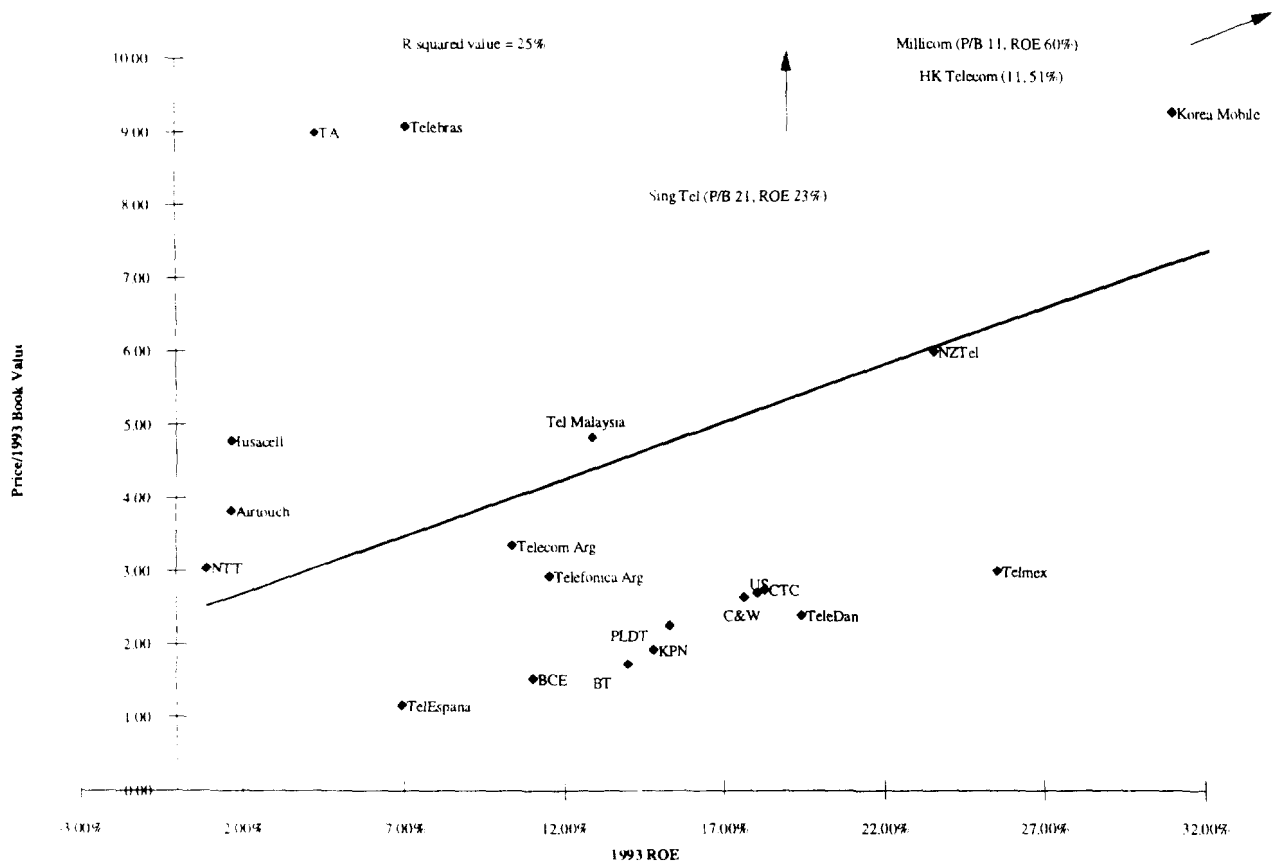
Global Telecom Group This final analysis attempts to compare investors' valuation of a company's equity in relation to a company's ability to earn on that equity. When we plot the entire group of companies in this comparison, we get an r-squared value of 25% — not impressively significant. Not surprisingly, the outliers are the wireless companies, which are not under rate-of-return regulation and have demonstrated the ability to earn above-average returns on equity (Figure 13).

Focusing more closely on the traditional telephone service companies operating in a regulated environment, the regression indicates that **CTC**, for instance, appears undervalued given its reported return on equity. However, given the changing regulatory and competitive environment, this stock may not be as undervalued as it appears since the ability to sustain this high ROE is questionable.

By contrast, **Singapore Telecom** appears to get a premium valuation given its return on equity. We would not be surprised if this reflects the market's confidence in the stability of the regulatory environment and the government's commitment to maintaining the current monopoly structure.

Figure 13

Global Telecom Group — Price-to-Book vs. Return on Equity



Source: Company reports and Morgan Stanley estimates.

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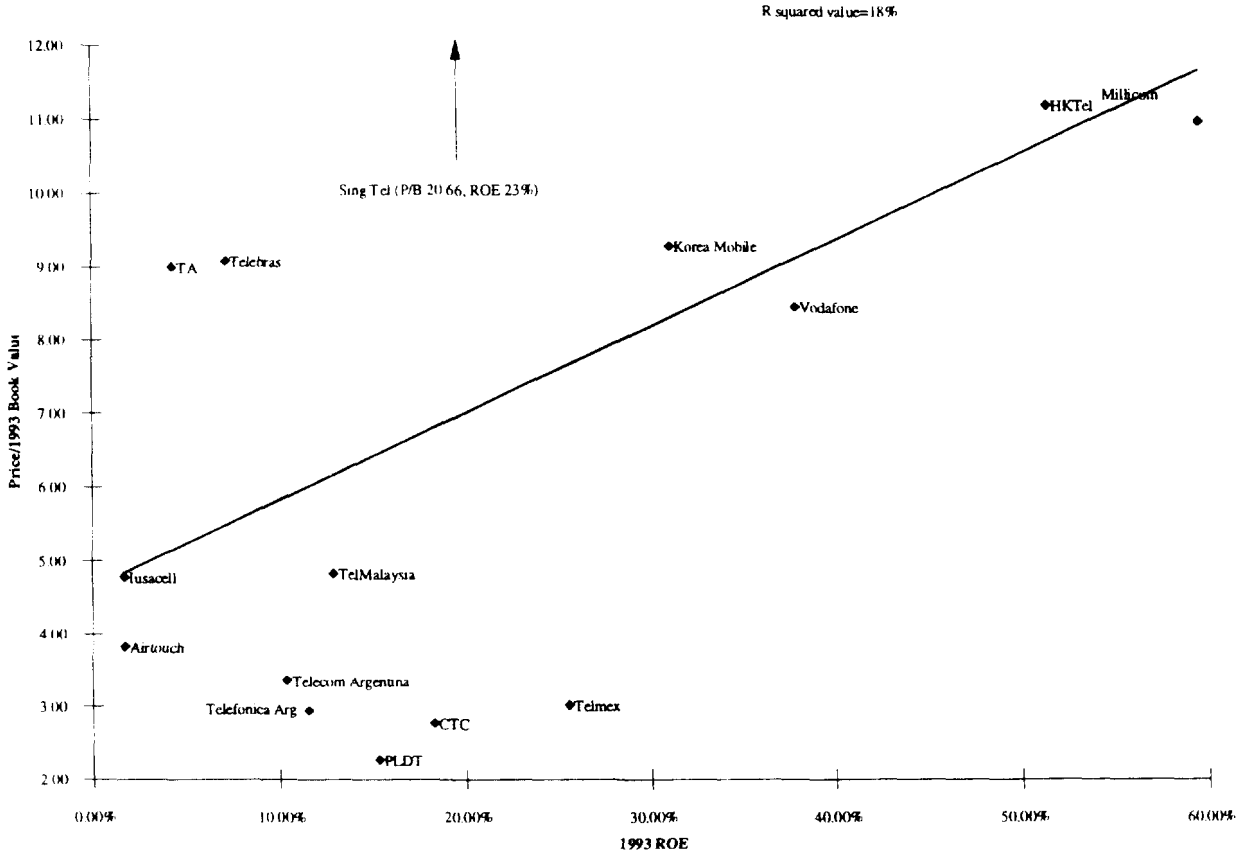
The subgroup analysis illustrates these differences even more clearly:

Emerging/Growth Telcos For the emerging/growth telcos, our r-squared value of 18% is even lower than the group correlation. Outliers, illustrated in Figure 14, again include **Singapore Telecom**, which is well above the regression line. Many of the Latin American telephone company names fall significantly below the regression line. **Telmex**, for instance, appears to have a low price-to-book value given its return on equity, which is comparable with that of **Singapore Telecom**. Yet, **Singapore Telecom** shares garner a higher price-to-book valuation. For **Telmex**, this can partially be explained by the uncertainty about the sustainability of this level of return on equity given the prospect for further competition in Mexico's local and long distance markets over the next few years.

Figure 14

Emerging/Growth Telecoms — Price-to-Book vs. Return on Equity



Source: Company reports and Morgan Stanley estimates.

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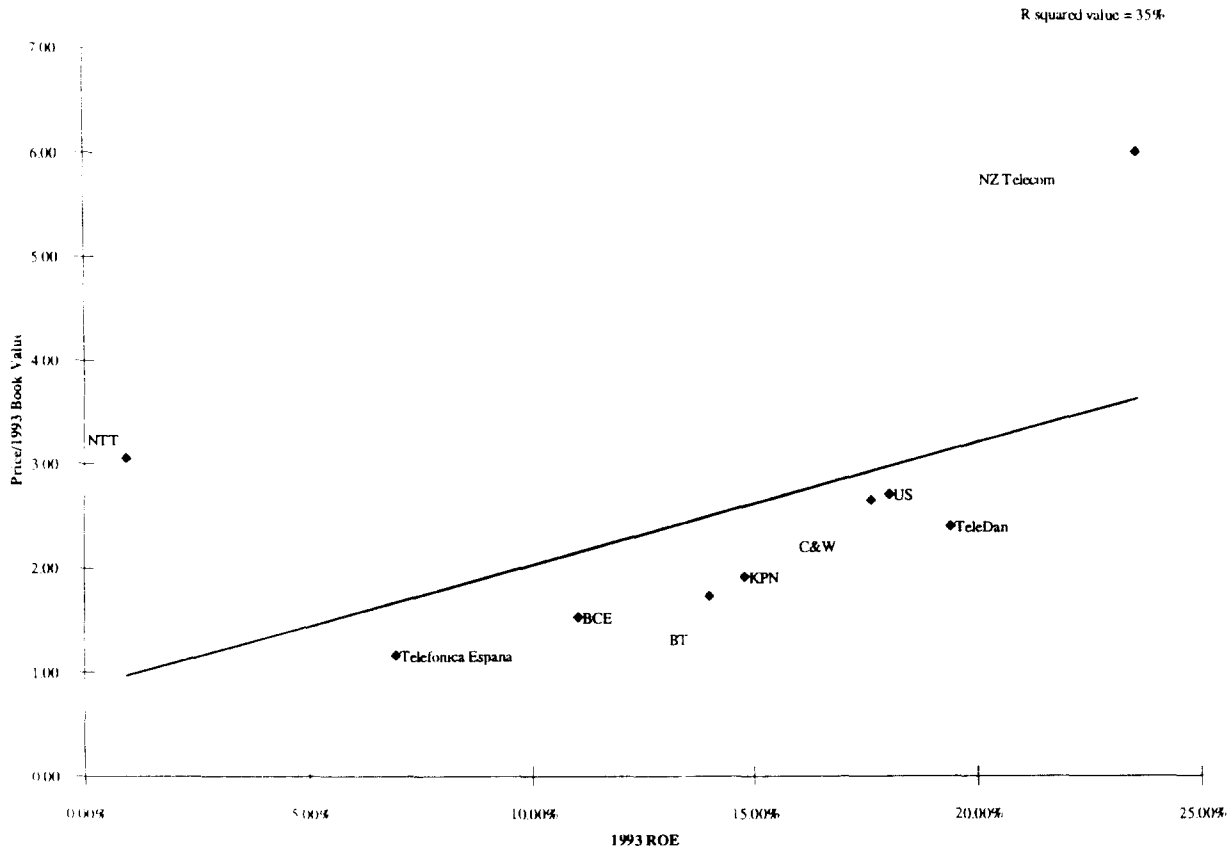
Mature Telephone Companies The correlation improves when we plot the mature telephone companies. As illustrated in Figure 15, the r-squared for this group reaches 35%, better than the emerging/growth telephone companies at 18% and even an improvement over the entire group of companies with its r-squared of 25%.

To a great extent, the European and U.S. telephone companies hover around the regression line. The most significant outliers include **New Zealand Telecom** and **NTT**. Both appear overvalued on this benchmark relative to their peers. Interestingly, they appear more fairly valued on the group regression (Figure 13), indicating that investors may be valuing them more as emerging/growth telephone companies than as mature telephone companies.

In fact, if we remove both **NTT** and **New Zealand Telecom** from the mature telco regression, the r-squared improves to 87% (see Figure 16), and the remaining telephone companies plot neatly along the regression line.

Figure 15

Mature Telecoms — Price-to-Book vs. Return on Equity



Source: Company reports and Morgan Stanley estimates

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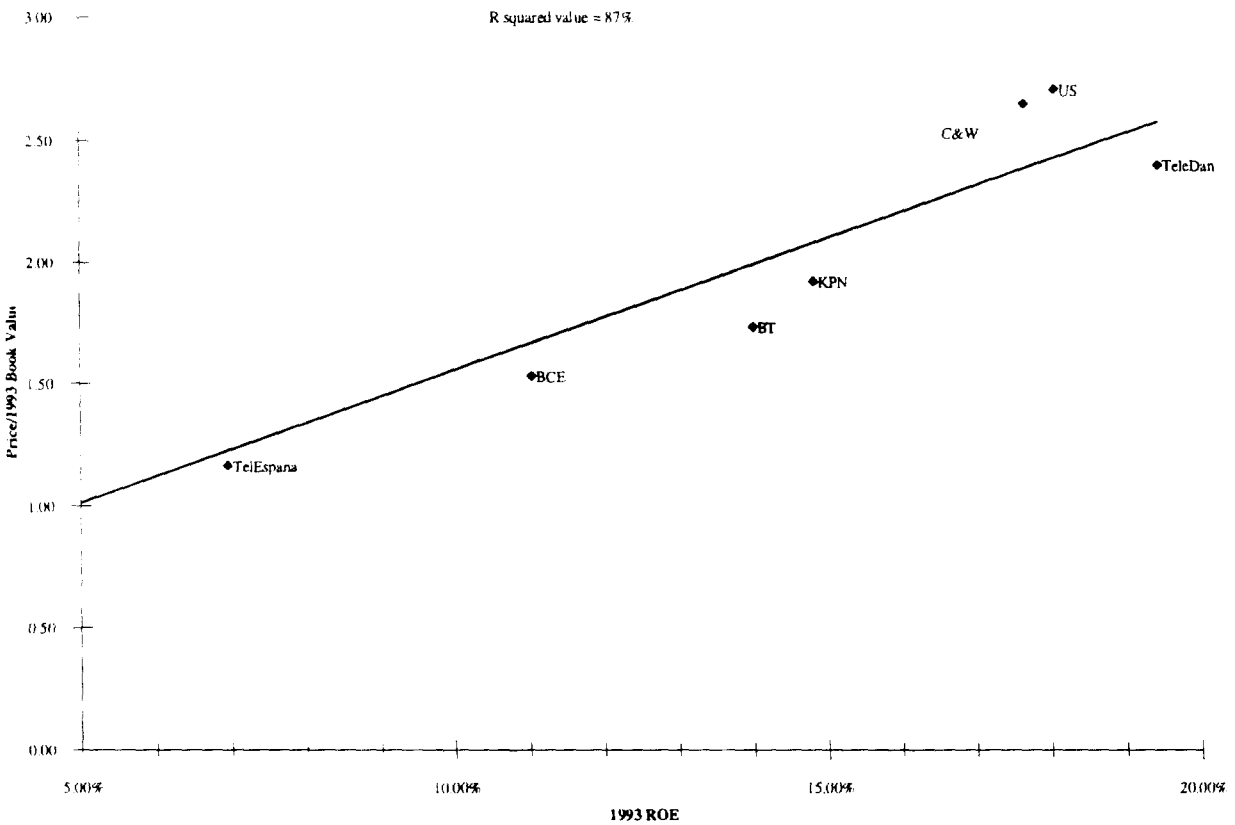
Figure 16

Mature Telecoms (excluding NTT and NZ Telecom) — Price-to-book vs. Return on Equity



Source: Company reports and Morgan Stanley estimates.

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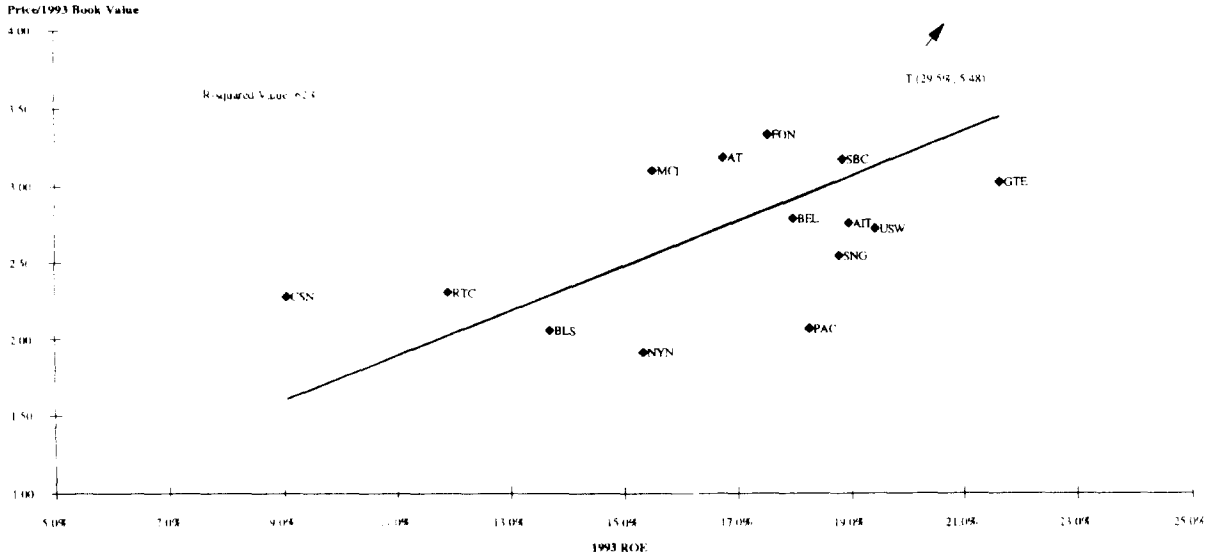
U.S. Telephone Companies Finally, when we consider the U.S. telephone companies, the correlation improves dramatically as well, with the r-squared value shooting to 62%. While this is still not as strong a correlation as some of the other valuation approaches for the U.S. telephone companies, it is stronger than the other groups we plotted using return on equity and price-to-book value.

The Bell RHCs generally screened more attractively in this graph than the long distance carriers. Moreover, of the Bell RHCs, **Pacific Telesis, US West,** and **Bell South** looked the most dramatically undervalued. By contrast, **MCI, Sprint,** and **AT&T** appear to garner higher price-to-book values relative to their returns on equity and thus on this benchmark are valued at a premium to the group of U.S. telcos.

Figure 17

The U.S. Telcos — Price-to-Book vs. Return on Equity



Source: Company reports and Morgan Stanley estimates.

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