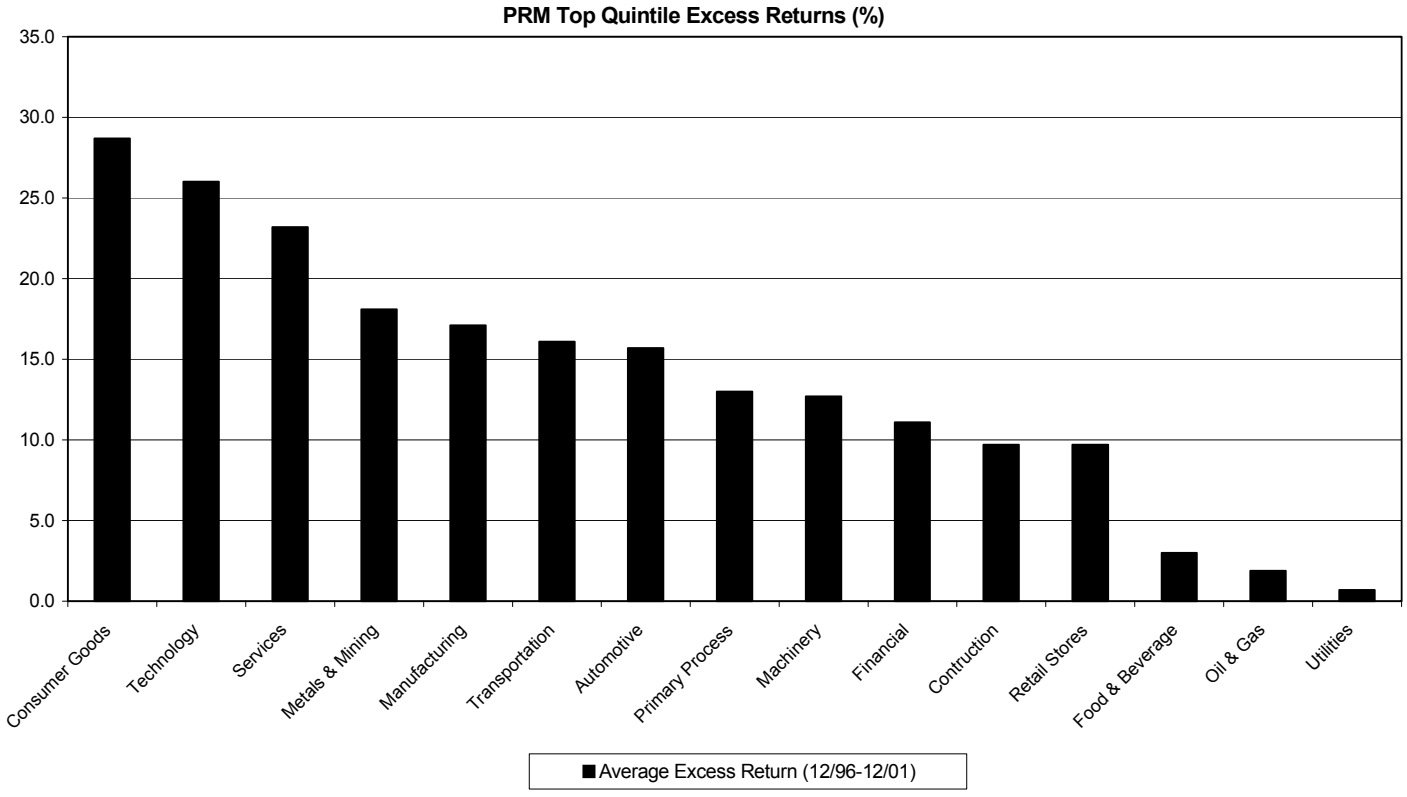
Ford Equity Research Special Study

Price/Momentum Sector Analysis - April 30, 2002

The Ford Price Momentum model (PRM) which was introduced in August 1991, exploits the relationship between historical price performance and the short term mean reversion effect to identify equities with above average potential for near term performance. Since its introduction, PRM has produced excellent results across a broad universe of stocks. This study examines Price Momentum's effectiveness when applied to industry groups and industry sectors. The study also tests PRM performance when portfolio industry weights are matched to index industry composition to eliminate any tendency of the model to over weight any single industry.

Industry Groups

The initial part of this study examines whether Price Momentum ranking can produce excess returns when used within a single industry group. The universe of stocks (ranging in number from 4000 to 4521) was sectored into Ford's 15 macro industry sectors on a monthly basis for the 5-year period 12/96 – 12/01. Each of these industry groups was then ranked in descending order by PRM and divided into 5 equally sized sectors. Performance figures were computed for each sector and compared with the average industry group return. Over the 5-year period, all of the highest PRM sectors outperformed their respective industry groups. Additionally, the top PRM sectors produced good results on a year by year basis with 4 groups outperforming in all 5 years, 8 groups outperforming 4 of 5 years and 3 groups outperforming 3 of 5 years.



This chart shows the average annual top quintile return in excess of the industry group average return for the 5 year period ended December 2001 for Ford's 15 macro industry groups.

Automotive

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	23.7	49.0	15.2	24.3	-2.7	21.3
12/97-12/98	53.5	9.9	0.3	-26.0	-16.8	1.8
12/98-12/99	-3.3	15.2	-10.5	-13.8	-18.5	-6.3
12/99-12/00	-7.4	-11.5	-22.7	-28.2	-34.2	-20.6
12/00-12/01	44.9	42.5	19.4	28.2	21.3	32.5
12/96-1201 (annual)	19.7	18.9	-0.9	-6.1	-12.0	4.0

Machinery

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	75.5	44.8	60.7	27.0	29.7	47.3
12/97-12/98	-10.8	-21.5	-32.1	-35.0	-42.8	-28.3
12/98-12/99	31.8	22.9	10.0	-3.1	23.5	16.9
12/99-12/00	24.6	52.5	20.0	36.5	5.7	28.9
12/00-12/01	10.8	9.9	6.7	0.3	-9.6	4.0
12/96-1201 (annual)	23.3	18.5	9.0	1.9	-2.7	10.6

Consumer Goods

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	34.8	27.5	21.8	15.3	-17.0	15.2
12/97-12/98	38.0	1.7	5.3	-4.1	-23.9	1.9
12/98-12/99	59.8	20.3	5.2	1.9	6.4	17.5
12/99-12/00	41.7	37.1	4.6	16.2	26.0	28.2
12/00-12/01	62.1	43.4	36.0	14.7	1.5	30.4
12/96-1201 (annual)	46.9	25.1	13.9	8.5	-3.0	18.2

Technology

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	19.4	24.8	16.3	17.5	2.8	16.2
12/97-12/98	36.0	19.1	-1.1	-1.9	-12.8	6.9
12/98-12/99	198.7	91.3	71.3	67.8	87.6	99.6
12/99-12/00	-32.6	-27.0	-25.5	-23.2	-31.4	-27.0
12/00-12/01	69.6	20.7	11.0	-6.9	-27.6	10.6
12/96-1201 (annual)	40.9	20.1	10.3	6.7	-3.5	14.9

Food & Beverage

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	61.8	48.3	33.9	38.2	14.3	39.2
12/97-12/98	3.8	12.4	-0.2	3.8	5.8	5.5
12/98-12/99	-18.0	-3.6	-14.9	-16.1	-37.0	-18.3
12/99-12/00	1.5	-5.6	9.5	23.1	7.5	7.5
12/00-12/01	43.7	50.1	29.2	29.2	28.8	36.5
12/96-1201 (annual)	15.0	17.9	9.9	13.9	1.1	12.0

Construction

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	40.7	22.8	26.8	15.4	10.1	22.9
12/97-12/98	14.1	-7.0	-3.5	-11.1	-7.9	-3.2
12/98-12/99	10.8	0.7	-6.4	-9.9	-24.3	-6.3
12/99-12/00	5.7	31.5	19.8	5.2	-4.5	11.1
12/00-12/01	33.0	40.0	33.2	21.8	32.2	32.4
12/96-1201 (annual)	20.1	16.2	12.8	3.4	-0.6	10.4

Retail Stores

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	41.2	46.1	22.8	13.8	31.9	30.9
12/97-12/98	48.3	21.9	17.5	24.0	27.5	28.7
12/98-12/99	5.5	4.1	-10.2	1.0	-8.0	-1.2
12/99-12/00	-24.5	-22.6	-11.3	-12.2	-38.1	-21.6
12/00-12/01	92.0	97.4	59.2	65.0	12.6	64.7
12/96-1201 (annual)	26.2	23.2	12.8	15.6	1.5	16.5

Financial

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	60.1	62.6	57.0	49.0	32.1	51.8
12/97-12/98	6.2	8.2	2.9	-3.4	-14.9	-0.4
12/98-12/99	7.0	-3.8	-9.5	-2.4	-22.2	-6.6
12/99-12/00	39.8	30.7	19.6	21.8	-2.7	21.4
12/00-12/01	28.7	26.7	28.4	12.5	8.0	20.7
12/96-1201 (annual)	26.8	22.9	17.5	14.0	-1.7	15.7

Metals & Mining

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	-24.2	-19.9	-16.0	-21.7	-19.6	-19.9
12/97-12/98	24.6	2.4	-19.5	-27.8	-44.1	-14.0
12/98-12/99	58.9	3.9	9.2	11.0	-6.6	15.5
12/99-12/00	7.2	-27.0	-16.3	7.7	-24.2	-10.0
12/00-12/01	27.7	29.6	15.6	16.5	14.4	22.7
12/96-1201 (annual)	15.5	-4.2	-6.5	-4.7	-18.3	-2.6

Services

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	35.2	21.8	35.1	13.6	12.6	23.4
12/97-12/98	23.9	13.2	2.9	-11.5	-18.0	1.4
12/98-12/99	47.5	6.6	-2.4	0.9	-7.5	7.8
12/99-12/00	-11.2	-6.2	-4.5	-3.8	-21.3	-9.1
12/00-12/01	92.4	37.9	22.7	22.8	-1.4	32.5
12/96-1201 (annual)	33.4	13.7	9.7	3.7	-7.9	10.2

Manufacturing

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	28.2	39.7	36.7	19.9	22.2	29.5
12/97-12/98	6.7	13.1	-8.8	-15.2	-18.3	-5.0
12/98-12/99	37.5	9.7	-1.0	-10.3	-6.6	5.3
12/99-12/00	31.0	1.2	-10.1	-7.5	-13.0	0.1
12/00-12/01	20.4	19.7	4.4	6.1	-6.0	9.0
12/96-1201 (annual)	24.3	16.0	3.0	-2.2	-5.3	7.2

Transportation

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	33.3	48.3	38.0	16.3	21.1	31.5
12/97-12/98	5.0	-5.2	0.4	-15.3	-18.4	-6.3
12/98-12/99	18.1	7.9	-2.6	-9.4	-17.6	-0.8
12/99-12/00	31.9	1.7	23.6	-6.4	-13.2	7.1
12/00-12/01	33.9	9.5	16.9	-12.4	8.3	11.4
12/96-1201 (annual)	23.9	11.1	14.3	-6.1	-5.2	7.8

Oil & Gas

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	16.1	16.0	13.3	17.4	8.5	14.8
12/97-12/98	-47.0	-38.6	-29.5	-36.4	-56.8	-41.8
12/98-12/99	46.6	34.7	28.9	28.8	7.4	29.7
12/99-12/00	98.4	93.2	78.5	51.1	44.6	73.8
12/00-12/01	-19.3	-9.8	-4.1	-4.0	-23.5	-12.2
12/96-1201 (annual)	7.6	10.8	12.0	6.9	-11.1	5.7

Utility

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	24.0	39.2	37.9	23.3	27.4	30.5
12/97-12/98	33.8	15.0	13.4	8.2	0.8	14.3
12/98-12/99	84.3	11.6	-1.4	6.2	36.5	25.0
12/99-12/00	-54.2	-34.1	19.9	24.6	4.9	-10.8
12/00-12/01	7.0	-6.2	2.3	-27.6	-41.0	-12.7
12/96-1201 (annual)	8.4	2.0	13.6	5.0	1.7	7.7

Primary Process

	High PRM	Quint.-2	Quint.-3	Quint.-4	Low PRM	Industry Group
12/96-12/97	23.1	26.9	23.6	5.3	12.9	18.3
12/97-12/98	-13.1	-4.9	-22.5	-8.8	-37.1	-17.9
12/98-12/99	36.9	28.7	7.7	-2.5	-3.6	12.9
12/99-12/00	-15.1	-14.6	-1.5	-16.7	-10.9	-11.5
12/00-12/01	61.4	14.3	10.3	8.4	-19.4	13.2
12/96-1201 (annual)	14.9	8.7	2.3	-3.3	-13.2	1.9

Capitalization Sectors

To test the effectiveness of PRM within capitalization sectors we used the S&P 500, Midcap 400, and Smallcap 600 indexes for our large, mid, and small cap universes. The stocks in each of these indexes were ranked by Price Momentum in descending order and divided into equal-sized quintiles. Equal-weighted and cap-weighted performance was computed on each sector. The performance results were good with the top PRM quintile outperforming its respective index over the 5-year period in each of the three indexes tested. The results were best in the midcap index with excess returns for the top PRM quintile over the index of 13.9% and 22.5% for equally-weighted and cap-weighted universes, respectively. In comparison, the S&P 500 top PRM quintile had equally-weighted and cap-weighted excess returns over its universe of 7.4% and 12.9%, respectively, and the Smallcap 600 top PRM quintiles posted excess returns of 9.8% and 6.3%.

S&P 500 (equally weighted)

	High PRM	Quintile 2	Quintile 3	Quintile 4	Low PRM	S&P 500
12/96-12/97	36.0	34.0	26.0	23.1	25.4	28.9
12/97-12/98	35.9	18.7	14.1	2.3	-1.5	13.3
12/98-12/99	30.9	6.6	7.7	6.2	8.7	11.9
12/99-12/00	-2.9	16.5	18.3	20.3	-1.7	10.5
12/00-12/01	7.2	7.7	1.2	7.1	-16.0	1.4
12/96-12/01 (annual)	20.3	16.3	13.1	11.5	2.1	12.9

S&P 500 (cap weighted)

	High PRM	Quintile 2	Quintile 3	Quintile 4	Low PRM	S&P 500
12/96-12/97	38.0	39.5	24.9	27.1	23.0	33.4
12/97-12/98	64.3	28.3	25.7	9.8	13.1	28.8
12/98-12/99	58.2	10.8	13.4	3.1	7.1	20.7
12/99-12/00	-21.4	-0.6	0.1	-0.2	-13.6	-8.5
12/00-12/01	2.9	4.6	-16.2	-11.0	-28.6	-12.0
12/96-12/01 (annual)	23.7	15.6	8.4	5.0	-1.7	10.8

Mid Cap 400 (equally weighted)

	High PRM	Quintile 2	Quintile 3	Quintile 4	Low PRM	Midcap 400
12/96-12/97	49.1	32.5	31.1	28.1	17.7	31.4
12/97-12/98	24.3	11.1	7.2	3.3	-8.0	7.3
12/98-12/99	35.4	-2.7	-2.1	1.0	2.6	6.3
12/99-12/00	18.3	28.2	27.3	22.0	3.2	20.3
12/00-12/01	21.8	14.4	25.2	6.5	-1.1	13.3
12/96-12/01 (annual)	29.3	16.0	17.0	11.7	2.5	15.4

Mid Cap 400 (cap weighted)

	High PRM	Quintile 2	Quintile 3	Quintile 4	Low PRM	Midcap 400
12/96-12/97	49.2	35.7	30.1	24.0	12.8	32.6
12/97-12/98	59.3	23.5	8.1	4.4	-9.6	19.0
12/98-12/99	58.7	-1.0	-1.5	-5.3	4.1	15.5
12/99-12/00	22.4	16.9	24.5	30.7	0.2	18.8
12/00-12/01	13.0	2.0	10.3	-8.2	-15.4	0.0
12/96-12/01 (annual)	39.2	14.6	13.7	8.0	-2.1	16.7

Small Cap 600 (equally weighted)

	High PRM	Quintile 2	Quintile 3	Quintile 4	Low PRM	Smallcap 600
12/96-12/97	32.6	39.4	27.0	19.7	8.9	25.3
12/97-12/98	12.2	15.5	-6.8	4.8	-18.9	0.8
12/98-12/99	34.0	19.3	-1.5	3.6	11.4	13.0
12/99-12/00	8.0	14.6	24.9	16.1	4.4	14.1
12/00-12/01	41.2	37.9	28.3	14.7	1.6	24.3
12/96-12/01 (annual)	24.9	24.9	13.3	11.6	0.9	15.1

Small Cap 600 (cap weighted)

	High PRM	Quintile 2	Quintile 3	Quintile 4	Low PRM	Smallcap 600
12/96-12/97	28.0	35.9	30.1	22.9	12.3	25.9
12/97-12/98	10.7	12.6	-9.5	-4.9	-18.3	-1.2
12/98-12/99	36.0	14.7	-3.0	1.3	13.1	14.0
12/99-12/00	7.4	15.9	28.0	21.1	0.7	13.7
12/00-12/01	9.5	23.7	10.8	-1.8	-11.2	6.9
12/96-12/01 (annual)	17.8	20.3	10.1	7.1	-1.5	11.5

Index Industry Sector Weighted

To neutralize the industry sector bias introduced by the model, we sectored each of the 15 macro groups within each index into PRM quintiles. Then, industry weights were applied to the performance results of each sector as seen in the tables below. Constraining the industry emphasis that the model introduces also produced good results; better than the equally-weighted returns but not as good as the cap-weighted results. The top Price Momentum quintiles produced excess returns of 9.7%, 18.7% and 6.6% for the large, mid and small cap groups in the period studied.

S&P 500 (sector neutral)

	High PRM	Quintile 2	Quintile 3	Quintile 4	Low PRM	Industry Group
12/96-12/97	31.9	37.0	27.3	24.8	24.3	30.4
12/97-12/98	36.7	22.0	18.9	11.4	6.2	19.0
12/98-12/99	56.0	10.4	4.2	5.0	18.5	19.5
12/99-12/00	-11.9	32.8	6.0	22.2	-2.9	3.5
12/00-12/01	11.1	8.3	-8.7	0.8	-25.0	-4.8
12/96-1201 (annual)	22.5	21.5	8.8	12.5	2.7	12.8

Midcap 400 (sector neutral)

	High PRM	Quintile 2	Quintile 3	Quintile 4	Low PRM	Industry Group
12/96-12/97	50.3	32.3	30.1	28.4	18.5	32.5
12/97-12/98	39.0	15.1	11.4	9.5	-2.8	14.3
12/98-12/99	56.6	2.4	7.7	5.3	10.0	17.8
12/99-12/00	10.7	20.5	27.0	27.4	3.2	16.4
12/00-12/01	34.8	16.3	24.8	-1.5	-3.7	12.9
12/96-1201 (annual)	37.3	16.9	19.9	13.2	4.7	18.6

Smallcap 600 (sector neutral)

	High PRM	Quintile 2	Quintile 3	Quintile 4	Low PRM	Industry Group
12/96-12/97	32.0	43.5	30.6	22.1	11.6	28.6
12/97-12/98	13.2	14.3	-5.4	5.6	-15.5	2.4
12/98-12/99	36.6	19.8	2.7	5.5	17.7	17.1
12/99-12/00	4.1	7.3	41.8	22.6	7.2	14.7
12/00-12/01	32.4	33.4	27.3	13.1	-1.3	20.7
12/96-1201 (annual)	23.0	23.0	18.0	13.5	3.3	16.4

Conclusion

In addition to producing excellent results across the broad universe, the Price Momentum model performs well when applied within industry groups. PRM also works well across all capitalization sectors with especially strong performance in the midcap stocks over the past 5 years. Finally, when adjusting for industry sector weightings within capitalization sectors, Price Momentum produced good results which indicates it may be a useful variable to incorporate into a sector neutral strategy.