Empirical Evidence Of Sector Rotation: A Case Study Of "Old" Economy Industry And "New" Economy Industry

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Abstract

This research examines whether variations in returns exist between "Old" economy industry and "New" economy industry when the U.S. economy changed from expansion to contraction. The two-year period, 1999-2000 is used for examining sector rotation. Further, this study tends to investigate whether the lack of consistent time-series performance presents within an industry. Our sample industries include Oil Exploration and Production industry, Oil Well Service and Equipment industry, and Integrated Oil industry to be the representative "Old" economy industries. Business-to-Business software industry is an example of "New" economy industry. In general, our results support our hypothesis that industry factor is an important basis for substantial returns variations between "New" economy industry and "Old" economy industry. Business-to-Business software industry reports statistically significant positive Jensen Alpha of 199.66% and 483% in third quarter of 1999 and fourth quarter of 1999, respectively. However, Business-to-Business software industry shows deteriorated Jensen Alpha approaching the end of 2000. This study also documents considerable changes of quarterly Jensen Alpha for three Oil industries from time to time. Empirical evidence indicates the apparent lack of consistency in returns within an industry over time. Moreover, consistent with the oil gas futures prices patterns, three Oil industries have underperformed the market in 1998 and significantly outperformed the market in 2000.

1. Introduction

The top-down fundamental analysis includes three steps: market and economy analysis, industry analysis, and company analysis. When investors are convinced that current economy and market provide favorable conditions, investors have to consider which industry provides prominent returns in the future. Consequently, investors shall re-examine their portfolios to make some necessary adjustments based on their industry analysis. One of the investment strategies is called sector rotation, where investors shift the weights of securities in their portfolios to take advantage of industries that are expected to do relatively better than other industries. Proponents of such an investment strategy believe that with the help of market timing ability, they are able to maximize returns by changing investment weights among various industrial sectors. However, others cast doubt of the profitability of sector rotation strategy because of transaction cost occurred when securities frequently traded. Nevertheless, it is not the subject of our paper to reconcile the conflicting views on sector rotation as a profitable investment strategy. The objective of this study is two-fold. First, the study tends to examine whether evidence of sector rotation is discernible when economy is changing from expansion to contraction. The study period is from 1999 to 2000. Various industries are selected to represent two different types of economy: "New" economy vs. "Old" economy. Due to short trading history of "New" economy firms, we conduct our empirical test in the form of an exploratory case study. Business-to-Business software industry is a representative of "New" economy industry, while Oil industry represents the traditional "Old" economy industry. Second, the study intends to further investigate previous performance of these selected industries beyond the study period, i.e., 1995-1998. By doing so, we can uncover

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whether momentum performance exists within industries over periods of time.

Numerous previous studies have documented the average performance of stocks from various industries did indeed demonstrate substantially different growth rates over periods of time (See King (1966), Brown and Ball (1967), and Latane' and Tuttle (1968)). Later, Brigham and Pappas (1969) reported supportive evidence, which indicated significant variations in returns among industries, and moreover, stocks within an industry also presented considerable returns variations. Thus, it is worthwhile for investors exploring different industries likely to perform well in the future. As regards a question of the consistency of industries performance over time, Mel Tysseland (1971) has not found the conclusive evidence on the consistent time-series performance for selected industries. Reilly and Drzycimski (1974) re-examined the issue of performance persistence. They found that past winning industries are not necessary to be the future winning industries. The evidence of lack of persistent industries performance over time may explain why industries are in and out of favor as mutual funds managers rebalance their asset allocations across different industries. At same time, other studies are concerned with the causes of returns variations among industries. It is logical to postulate industry returns vary from time to time simply to reflect the changes of aggregate market return. In other words, market effect dominates industry effect, then affects securities returns accordingly. Gaumnitz (1971) reported that industry effect can be distinguished from a market factor or from a company factor when pricing securities. Meyers (1973), and Livingston (1977) had also shown, after adjusting a market factor, industry factor still has an important influence on returns of many firms within industries. Hence, it is important for investors to emphasize their portfolios weights in industries likely to accelerate their growth rate in the future.

In March 2000, NASDAQ Composite Index closed above 5000 record level. NASDAQ Composite Index has gained more than 80% in 1999, which was the largest percentage gains since the index was established. Many investors have been rewarded with hefty returns by investing portfolios concentrating in high tech stocks. In particular, firms operating in business associated with the Internet have become the favorable investment choices for many investors. A term of "New" economy has been created to describe such firms which generate most of their profit from products directly related to intellectual property and computer technology (See Coy (2000)). These "New" economy industries focus on selling products that are the result of intellectual work, not of physical work. For example, companies in "New" economy industry sell products such as software programs and hand held electronic planners. However, such stellar performance of "New" economy industry did not continue to the second half of 2000. Because of problems of over-capacity in factories, hangover inventory, sharp rising in oil price, etc., the U.S. economy has gradually slowed down. Accordingly, the first purpose of this study is to examine whether "New" economy industry has shown return variations during this economy transition phase changing from expansion to contraction. By doing so, "Old" economy industry has been chosen as the counterpart of "New" economy industry. "Old" economy industries generate most of their profit from physical products or services. So, "Old" economy industry is quite reliant on the physical plant and product. Peter Burrows (2000) defines these "Old" economy companies as firms with "bricks and mortar," like companies selling items such as cars, clothes, and oil. Because of the noticeable difference in their fundamental business operations, we hypothesize that there exist considerable variations in returns between "Old" and "New" economy industries. Empirical evidence of our study enables us to shed light on the existence of sector rotation. Furthermore, the second objective of this study is to examine whether substantial good performance of an industry in one period can repeat in the following period, that is, whether the consistency of time-series of industry performance is observed. Evidence of inconsistent time-series of industry performance tends to corroborate the existence of sector rotation.

The remainder of this paper is organized as follows. Section II provides background information on oil price history and causes of failing Business-to-Business software industry (hereafter, B-to-B is used). Section III describes data, sample selection, and empirical methodology along with empirical results. Section IV concludes our findings and provides future research direction.

II. Research Background

Henry J. Hyde (2000) explained during Congressional Testimony on March 29, 2000 why gasoline prices rose during 1999 and 2000: "The primary reason is that the member countries of the Organization of Petroleum Exporting Countries, or OPEC, have conspired to restrict the supply of crude oil." Due to the fact that oil was in short

supply, firms in the oil industry could charge more for their product. The increase in oil prices has clearly affected the oil industry in a positive way. Crude oil rose above $30 per barrel, which is almost triple the crude oil price in early 1990's.

With respect to B-to-B, the rapidly increasing number of competitors in the market has caused the slow down in B-to-B sector. Table 1 reports that the number of "New" economy firms triples from 1998 to 1999, and almost doubles from 1999 to 2000. E.piphany CEO Roger Siboni explained, "The market was like a Moroccan bazaar." Mark Boslet (2001) from the *Industry Standard* explained, "With 25 companies competing for every sale, customers were confronted with the equivalent of Marrakech sidewalk vendors, the air ringing with trendy B-to-B buzzwords such as e-procurement." With so much competition, *The Industry Standard* journal reported that the B-to-B market finally caved in during April of 2001. *The Industry Standard* goes on to report that profit warnings and bulk layoffs caused many investors to become increasingly concerned regarding the business outlook of many high P/E multiple B-to-B firms, and investors began unloading B-to-B stocks from their portfolios. Mark Boslet explained that the departures of Ariba CEO Keith Krach and i2 CEO Sanjiv Sidhu caused investors to become even more skeptical about the future of corporate America. This down turn is likely to continue for months to come. With the increasing competition among "New" economy firms, the "Old" economy firms may have an advantage in outperforming the market and ultimately attract investors from "New" economy industries.

Table 1
Summary Of New Economy Firms Created Over 1998-2000

Year	Number of New Firms[*]	Dollar Amount Invested (Million Dollar)[*]
1998	234	1,830
1999	676	9,220
2000	1,221	23,370
Total	2,131	34,420

*Source: Venture Economics/National Venture Capital Association

III.   Data, Methodology, and Results

A. Data and Sample Selection

In order to obtain an accurate and comparable measure of industry performance, sample firms are publicly held firms in order to extract daily stock prices. The criteria for selecting firms to represent "Old" and "New' economy industries are listed as follows:

- Each firm selected for the oil industry must have been established before 1995 and have daily stock prices from January 1995 to December 2000.
- Oil industry firms specializing in oil exploration and production, oil well services and equipment, or be defined as integrated oil companies are included in our sample.
- Each firm selected for the B-to-B software industry must have been established before 1999 and have daily stock prices from January 1999 to December 2000.

Oil industry as an example of "Old" economy is analyzed in three distinct categories. The first and largest category contains 54 firms and is made up of companies that specialize in oil exploration and production. The second category contains 19 firms, which specialize in oil well services and equipment. The final category contains 11 integrated oil companies. All these 84 firms are included in this study to represent an average performance of the overall oil industry.

The B-to-B software industry, representing the "New" economy, is composed of 40 firms. This industry is a reasonable measure of the "New" economy because it is based on firms with distinct products to enhance the efficiency of business operations through Internet applications. Our study does not select firms operating in aerospace,

integrated computer systems, and computer hardware systems industries because these industries have many years of establishment and offer more diversified products portfolios. These firms may operate in multiple industrial sectors, and sometimes can be viewed as "Old" economy industry, "New" economy industry or a hybrid of both industries.

Since "New" economy firms have distinct business models from those of "Old" economy firms, it is easy to see that financial characteristics between two economy types are different. Six financial ratios are used to describe differences between "New" and "Old" economy firms. We argue that long established "Old" economy firms find it easier to access the credit market than recently emerged "New" economy firms. Thus, long-term debt ratio is used as a proxy for the accessibility of capital market. In addition, many "New" economy firms are trading at high P/E multiple based on substantial future growth estimates, and are viewed as growth stocks. By contrast, investors view traditional "Old" economy firms as value stocks. Taken together, growth stocks tend to have higher market-to-book ratios than those of value stocks. Therefore, "New" economy firms are likely to have higher market-to-book ratios than those of "Old" economy firms. We also expect to see "Old" economy firms having higher cash flow than their counterparts. Table 2 provides the summary financial characteristics of sample firms. Consistent with previous conjecture, "New" economy firms have lower long-term debt ratio, lower cash flow and higher market-to-book ratio than those of "Old" economy firms. From 1999 to 2000, we have observed the U.S. economy changing from expansion to contraction, and many high P/E multiple securities prices declined significantly due to a decrease in their future earnings forecasts. As shown in Panel B of Table 2, P/E multiple of B-to-B industry was 10.06 vs. 6.78 in 1999 and 2000, respectively. On the other hand, oil industry has benefited from rising oil price, which leads to higher market price. Evidence of Panel B shows the average market-to-book ratio of Integrated Oil industry was 1.36, 2.49, and 8.30 in 1995-1996, 1997-1998, and 1999-2000, respectively. However, the other two oil industries do not present such patterns of market-to-book ratio changes.

Table 2
Summary Of Statistics Of Financial Characteristics

Six financial characteristics of each firm are selected from 1999 to 2000 each fiscal year. Average of Market-to-Book ratio is calculated for three oil industries from 1995 to 2000.

Panel A (All the financial information is obtained from Compustat.)

	B-to-B Means	Oil Exploration and Production Means	Oil Well Service and Equipment Mean	Integrated Oil Mean
Total Assets (millions)	1,515.38	936.98	1,630.66	54,630.47
ln (Total Assets)	5.17	5.53	6.55	10.58
Total Asset Turnover (ratio)	0.91	0.83	0.60	0.99
Cash Flows (millions)	90.37	201.94	135.01	6,691.33
Market / Book	8.62	6.89	7.07	8.30
Long-term Debt Ratio	5.32	32.40	26.89	13.63
Quick Ratio	3.27	13.47	2.28	0.74

Panel B (All the financial information is obtained from Compustat.)

	B-to-B	Oil Exploration and Production	Oil Well Service and Equipment	Integrated Oil
Market/Book/1999	10.07			
Market/Book/2000	6.78			
Market/Book/1999-2000	8.62	6.89	7.72	8.30
Market/Book/1998-1997	N/A	6.79	10.33	2.49
Market/Book /1995-1996	N/A	7.12	6.30	1.36
Number of Firms	40	51	19	11

B. Methodology and Quarterly Jensen Alpha Results

The method used to measure relative industry performance with market factor adjustment is the Jensen Alpha model. Traditionally, academic studies and practitioners have employed the Jensen model (Jensen, 1968 and 1969) (hereafter called Jensen Alpha) to measure returns of managed portfolios. Despite many criticisms associated with Jensen Alpha (See Roll (1978), and Lee and Rahman (1990)), Grinblatt and Titman (1993) found that inferences still can be drawn from different empirical measures as long as the same benchmark portfolios are adapted in a study.

In this study, the S&P 500 Index as well as NASDAQ Composite Index are used as the market portfolios benchmark. Oil Exploration and Production industry, Well Service and Equipment industry, and Integrated Oil industry, as well as B-to-B industry represent four equally weighted industry portfolios. Jensen Alpha measures the performance of four portfolios – Oil Exploration and Production industry, Well Service and Equipment industry, and Integrated Oil industry vs. B-to-B industry.

First of all, the equally weighted industry return is calculated for all four industries. Then, an ordinary least squares is adopted to estimate an intercept in a time-series regression of the excess return of the industry against excess return on the market portfolios benchmark. The excess return is computed by subtracting a daily ten-year T-Bond yield from the daily industry return and from the daily market return, respectively.[2] An intercept obtained from regression is the Jensen Alpha, which indicates abnormal returns (See Chang, Ma, Tsai and Yur-Austin (1999)). A positive value is preferred, and it indicates the industry earns return in excess of its risk-adjusted or market-adjusted required rate of return. In other words, the industry outperforms the market benchmark during the test period.

The ordinary least squares estimates abnormal return shown in equation (1).

$$\left(R_{j,d} - R_{f,d}\right) = \alpha_{j,d} + \beta_{j,d}\left(R_{m,d} - R_{f,d}\right) + \varepsilon_{j,d}$$

where

$R_{j,d}$ = The observed rate of return on the industry j on day d;

$R_{m,d}$ = The observed rate of return on the market portfolio on day d;

$R_{f,d}$ = The contemporaneous rate of return on the riskless assets;

$\beta_{j,d}$ = An index of the systematic risk level of the industry j on day d;

$\alpha_{j,d}$ = "Abnormal" return of the industry j on day d; and

$\varepsilon_{j,d}$ = An error residual terms with E ($\varepsilon_{j,d}$) = 0 on day d.

S&P 500 value-weighted index or NASDAQ value-weighted index is the proxy for the return on the market portfolio. Daily ten-year T-Bond yield is used as a proxy of the rate of return on a riskless asset.

Table 3 reports the Jensen Alpha of "New" economy industry: B-to-B industry in our study. Tables 4, 5 and 6 report the Jensen Alpha of three "Old" economy industries: Oil Exploration and Production industry, Well Service and Equipment industry, and Integrated Oil industry, respectively. As indicated in Table 3, the B-to-B industry has reported its best performance in the second half of 1999, with statistically significant positive Jensen Alpha of 199.66% and 483% in third quarter of 1999 and fourth quarter of 1999, respectively. However, the stellar performance is not sustained in the following year. The industry lost more than 50% of its gains in the first half of 2000, and deteriorates further in the second half of 2000. The B-to-B industry exhibits an average quarter abnormal performance that ranges widely from –115.99% to 483.00% per quarter when S&P 500 Index is used as the benchmark portfolio. Similar results are reported when NASDAQ Composite Index is used as the benchmark portfolio.

Noticeably, all three Oil categories industries have presented quite different performance patterns to those seen in the B-to-B industry. Except for the fourth quarter of 1999, Oil Exploration and Production Industry has reported positive quarterly Jensen Alpha over 1999-2000. Especially, five out of eight quarters, Oil Exploration and

Production Industry has performed more than 100% better than the overall market did. In particular, all these five quarters have reported statistically significant positive Jensen Alpha. Oil Well Service and Equipment industry has reported all positive but not statistically significant quarterly Jensen Alpha over our two-year study period.

As shown in Table 6, Integrated Oil industry does not have impressive quarterly performance like the other two categories in Oil industry. Also, variations in quarterly Jensen Alpha are narrower than the other two Oil industries do. We notice that three Oil industries, on average, reported solid performance from 1999 to 2000, which was primarily attributed to rising oil prices during the same time period. Evidence shown in Table 7 supports our argument, that is, gas oil future price has bottomed up in the first quarter of 1999 then moved upward significantly thereafter. In general, the empirical results corroborate previous findings in support of the existence of variations in returns among industries. The evidence implies that a possible sector rotation occurred between our sample firms in "Old" economy industry and "New" economy industry.

Table 3
Quarterly Jensen Alphas Of Business-To-Business Software Industry
(S&P 500 Index And Nasdaq Composite Index Benchmarks)

The sample consists of forty B-to-B software firms over the time period from January 1999 to December 2000. Quarterly Jensen Alphas are calculated with the value-weighted market index as a benchmark portfolio to measure B-to-B software industry performance. * Statistically significant at 5% level.

Quarter	Quarterly Jensen Alpha S&P 500 Index as Benchmark	Quarterly Jensen Alpha NASDAQ Composite Index as Benchmark
Jan-March/99	6.94%	-12.25%
April-Jun/99	114.96%	109.73%
Jul-Sep/99	199.66%*	140.53%*
Oct-Dec/99	483.00%*	352.98%*
Jan-March/00	165.27%	103.00%
April-Jun/00	-26.60%	-0.09%
Jul-Sep/00	31.88%	48.09%
Oct-Dec/00	-115.99	-19.51%

Table 4
Quarterly Jensen Alphas of Oil Exploration and Production Industry
(S&P 500 Index and NASDAQ Composite Index Benchmarks)

The sample consists of fifty-four Oil Exploration and Production firms over the time period from January 1999 to December 2000. Quarterly Jensen Alphas are calculated with the value-weighted market index as a benchmark portfolio to measure Oil Exploration and Production industry performance. * Statistically significant at 5% level.

Quarter	Quarterly Jensen Alpha S&P 500 Index as Benchmark	Quarterly Jensen Alpha NASDAQ Composite Index as Benchmark
Jan-March/99	49.28%	40.43%
April-Jun/99	134.71%*	139.08%*
Jul-Sep/99	124.38%*	107.97%*
Oct-Dec/99	-71.83%	-79.86%
Jan-March/00	199.96%*	159.13%*
April-Jun/00	159.08%*	139.08%*
Jul-Sep/00	138.64%*	137.40%*
Oct-Dec/00	73.96%	84.75%

Table 5
Quarterly Jensen Alphas of Oil Well Service and Equipment Industry
(S&P 500 Index and NASDAQ Composite Index Benchmarks)

The sample consists of nineteen Oil Well Service and Equipment firms over the time period from January 1999 to December 2000. Quarterly Jensen Alphas are calculated with the value-weighted market index as a benchmark port-folio to measure Oil Well Service and Equipment industry performance.

Quarter	Quarterly Jensen Alpha S&P 500 Index as Benchmark	Quarterly Jensen Alpha NASDAQ Composite Index as Benchmark
Jan-March/99	109.55%	95.97%
April-Jun/99	111.79%	123.74%
Jul-Sep/99	75.86%	63.37%
Oct-Dec/99	6.97%	1.32%
Jan-March/00	220.99%	205.30%
April-Jun/00	30.75%	30.09%
Jul-Sep/00	9.92%	8.22%
Oct-Dec/00	30.26	47.88%

Table 6
Quarterly Jensen Alphas of Integrated Oil Industry
(S&P 500 Index and NASDAQ Composite Index Benchmarks)

The sample consists of eleven Integrated Oil firms over the time period from January 1999 to December 2000. Quarterly Jensen Alphas are calculated with the value-weighted market index as a benchmark portfolio to measure Integrated Oil industry performance.

Quarter	Quarterly Jensen Alpha S&P 500 Index as Benchmark	Quarterly Jensen Alpha NASDAQ Composite Index as Benchmark
Jan-March/99	54.77%	51.98%
April-Jun/99	28.13%	40.06%
Jul-Sep/99	15.12%	-14.05%
Oct-Dec/99	-12.71%	-15.36%
Jan-March/00	-15.78%	-10.19%
April-Jun/00	32.86%	30.51%
Jul-Sep/00	32.73%	28.97%
Oct-Dec/00	-0.73	-5.33%

C. Performance Consistency Test Results

Our second objective is to test whether the industry exhibits a consistent time-series abnormal performance. In other words, can industry past performance be a reliable predictor for industry future performance? Will the past good performing industry continue to perform well in future? Numerous studies have demonstrated that within an industry, performance momentum doesn't hold up. In our study, we use three Oil industries to re-examine the issue of performance consistency.[3] Quarterly Jensen Alphas have been calculated for each quarter from January 1995 to December 1998. As reported in Tables 8, 9 and 10, all three industries demonstrate inconsistent quarterly performance over time. For example, Oil Well Service and Equipment industry reports 207.34% quarterly Jensen Alpha for third quarter of 1997 then report –63.22% in the following quarter. There is lack of consistent performance over this four-year study period within each industry.

Table 7
Gas Oil Futures Prices

Gas oil futures price over the time period from January 1995 to December 2000 are reported by The International Petroleum Exchange on London.

[1]Quarter	Gas Oil Futures Prices	% Changes of Gas Oil Futures Prices
Jan-March/95	152.93	
April-Jun/95	157.88	3.24%
Jul-Sep/95	152.92	-3.14%
Oct-Dec/95	152.66	-0.17%
Jan-March/96	155.43	1.81%
April-Jun/96	161.55	3.94%
Jul-Sep/96	172.94	7.05%
Oct-Dec/96	192.38	11.24%
Jan-March/97	181.88	-5.46%
April-Jun/97	172.31	-5.26%
Jul-Sep/97	171.28	-0.60%
Oct-Dec/97	173.28	1.17%
Jan-March/98	148.95	-14.04%
April-Jun/98	142.66	-4.22%
Jul-Sep/98	131.88	-7.56%
Oct-Dec/98	122.19	-7.35%
Jan-March/99	114.46	-6.33%
April-Jun/99	137.11	19.79%
Jul-Sep/99	165.11	20.42%
Oct-Dec/99	178.40	8.05%
Jan-March/00	197.02	10.44%
April-Jun/00	210.66	6.92%
Jul-Sep/00	245.02	16.31%
Oct-Dec/00	248.07	1.24%

The empirical evidence implies that it will be paid off to conduct industry analysis because the past winner may not be the future winner.[4] That explains why many brokerage firms or investment banking firms have their financial analysts track performance of securities across various industries, because today's losers may be tomorrow's winners. For most investors, the implied investment strategy is not to hold a portfolio primarily made up of securities from one particular industry. For example, in early 1990's, memory-chip industry was doing well, and by 1996 the problem of oversupply caused some firms to lose price by more than 80%. Such significant loss in investors' portfolios is not inevitable. Sector rotation strategy is the solution that investors are looking for. Our empirical results show variation in oil industry returns within test periods. One possible explanation for inconsistent performance is variations in crude oil price. For example, gas oil future prices deteriorated from 1997-1998, which caused our sample firms significantly under performed the market benchmark. Thus, our results indicate that beyond the market risk premium, industry related factors do yield industry returns variations over time

IV. Conclusion and Future Research Suggestions

This study examines whether variations in returns exist between "Old" economy industry and "New" economy industry when the U.S. economy changed from expansion to contraction. Further, this study demonstrates the lack of consistent time-series performance within an industry. Oil Exploration and Production industry, Oil Well Service and Equipment industry, and Integrated Oil industry are selected to represent "Old" economy industries. B-to-B software industry is an example of "New" economy industry. In general, our results support our hypothesis that industry factor is an important basis for substantial returns variations between "New" economy industry and "Old" economy industry. The evidence shows P/E multiple of B-to-B industry declined from 10.07 in 1999 to 6.78 in 2000, while Integrated Oil industry reported almost four times increase in P/E multiple within two-year test period

Table 8
Quarterly Jensen Alphas of Oil Exploration and Production Industry
(S&P 500 Index and NASDAQ Composite Index Benchmarks)

The sample consists of fifty-four Oil Exploration and Production firms over the time period from January 1995 to December 1998. Quarterly Jensen Alphas are calculated with the value-weighted market index as a benchmark portfolio to measure Oil Exploration and Production industry performance. * Statistically significant at 5% level

.Quarter	Quarterly Jensen Alpha S&P 500 Index as Benchmark	Quarterly Jensen Alpha NASDAQ Composite Index as Benchmark
Jan-March/95	33.68%	34.95%
April-Jun/95	23.83%	25.84%
Jul-Sep/95	32.48%	34.25%
Oct-Dec/95	20.46%	36.67%
Jan-March/96	57.74%*	58.84%*
April-Jun/96	91.77%*	83.46%*
Jul-Sep/96	44.37%	43.32%
Oct-Dec/96	81.47%*	91.20%*
Jan-March/97	-62.13%	-41.36%
April-Jun/97	35.88%	33.84%
Jul-Sep/97	88.08%*	74.04%*
Oct-Dec/97	-90.56%*	-58.91%*
Jan-March/98	-41.92%	-39.20%
April-Jun/98	-69.45%*	-70.60%*
Jul-Sep/98	-93.75%	-98.245
Oct-Dec/98	-194.27%*	-189.23%*

Table 9
Quarterly Jensen Alphas of Oil Well Service and Equipment Industry
(S&P 500 Index and NASDAQ Composite Index Benchmarks)

The sample consists of nineteen Oil Well Service and Equipment firms over the time period from January 1995 to December 1998. Quarterly Jensen Alphas are calculated with the value-weighted market index as a benchmark portfolio to measure Oil Well Service and Equipment industry performance. * Statistically significant at 5% level.

Quarter	Quarterly Jensen Alpha S&P 500 Index as Benchmark	Quarterly Jensen Alpha NASDAQ Composite Index as Benchmark
Jan-March/95	23.77%	26.35%
April-Jun/95	14.70%	14.76%
Jul-Sep/95	26.99%	24.84%
Oct-Dec/95	41.43%	53.46%
Jan-March/96	86.76%*	87.82%*
April-Jun/96	90.06%	76.00%
Jul-Sep/96	27.59%	26.51%
Oct-Dec/96	102.64%*	117.95%*
Jan-March/97	34.71%	60.226%
April-Jun/97	64.93%	63.32%
Jul-Sep/97	207.34%*	176.56%*
Oct-Dec/97	-63.22%	-10.34%
Jan-March/98	-88.04%	-81.55%
April-Jun/98	-115.39%*	-116.85%*
Jul-Sep/98	-140.50%	-145.99%
Oct-Dec/98	-164.07%	-167.89%

from 1997-1998 to 1999-2000. Sector rotation is probably attributable to such changes in P/E multiple. Particularly, "Old" economy industries, on average, have reported solid, good quarterly Jensen Alpha in the year 2000. It is reasonable to assume investors shift their investment from "New" economy industry to "Old" economy industry.

Noticeably different performance patterns between "Old" economy industry and "New" economy industry suggest it is worthwhile for investors to explore various industries which are likely to do better than other industries in the future. Therefore, industry analysis is useful and should be part of security valuation.

Table 10
Quarterly Jensen Alphas of Integrated Oil Industry
(S&P 500 Index and NASDAQ Composite Index Benchmarks)

The sample consists of eleven Integrated Oil firms over the time period from January 1995 to December 1998. Quarterly Jensen Alphas are calculated with the value-weighted market index as a benchmark portfolio to measure Integrated Oil industry performance. * Statistically significant at 5% level.

Quarter	Quarterly Jensen Alpha S&P 500 Index as Benchmark	Quarterly Jensen Alpha NASDAQ Composite Index as Benchmark
Jan-March/95	19.92%	28.76%
April-Jun/95	-12.85%	2.71%
Jul-Sep/95	-9.21%	2.42%
Oct-Dec/95	41.76%*	56.32%*
Jan-March/96	9.54%	17.85%
April-Jun/96	23.38%	23.27%
Jul-Sep/96	18.00%	18.72%
Oct-Dec/96	28.47%	45.31%
Jan-March/97	2.70%	17.70%
April-Jun/97	24.41%	38.96%
Jul-Sep/97	22.23%	-16.37%
Oct-Dec/97	-30.36%	8.40%
Jan-March/98	-42.70%	-16.98%
April-Jun/98	-10.18%	-7.44%
Jul-Sep/98	11.21%	0.62%
Oct-Dec/98	-78.04%	-58.44%

This study also documents considerable changes of quarterly Jensen Alpha for three Oil industries from time to time. However, the apparent lack of stability or consistency in returns over time suggests that the analysis of past industry performance is not sufficient for determining future industry performance. Consistent with the oil gas futures prices patterns, all three Oil industries have under performed the market in 1998 and significantly outperformed the market in 2000. It is essentially important to know that an effective investment strategy involving in sector rotation relies on accurate forecasts of economic conditions. Thus, a knowledge and understanding of the business cycle is important, as is an understanding of changes of interest rate, industry productivity, consumer price index and global economic conditions. Obviously, insightful assessments of all these economic activities changes help investors identify future potential winning industries.

Like most exploratory research, this study has two limitations. One is the short study period for "New" economy industry: B-to-B software industry. It would be interesting to replicate our study when we are able to compile more trading data. The other limitation is that we only include four industries in this study. It would be beneficial to expand the sample size by adding more industries to test the consistency and robustness of our empirical findings. For the future research directions, the returns of securities held in industries are analyzed to test volatility of securities' returns in the same industry. In addition to industry factors, we tend to examine how much of the returns' variations can be explained by firms' financial characteristics, such as debt ratio, price to earnings ratio, size or market to book ratio. The findings will offer valuable advice to security analysts in providing their recommendations on securities. Lastly, employing international data to test the sector rotation among industries will be an interest task for future research. 📖

Endnotes

1.   Latane' and Tuttle (1968) have reported different industries with annual return of 2% to 20% from 1944 to 1967.
2.   In 1999-2000, the bond yield curve is neither upward sloping nor downward sloping. Bond yield curve of this two-year period is approximately close to "hump" yield curve. Thus, we use 10-year instead of 30-year bond yield as the risk-free rate.
3.   Since B-to-B software industry has only two-year trading history, we use oil industries with more trading records.
4.   For example, retail stores industry performed well in 1986 and 1989 performed poorly in 1995 and came back with stellar performance in 1998.

References

1.   Boslet, M. 2001. After the B-to-B revolution. *The Industry Standard*. [Online], [2001, May 12].
2.   Brigham, Eugene, and Pappas, James. 1969. Rates of return on common stock. *Journal of Business* 42:302-316.
3.   Brown, Philio and Ball, Ray. 1967. Some preliminary findings on the association between the earnings of a firm; its industry and the economy. *Journal of Accounting Research* 5:55-77.
4.   Burrows, P. 2000. Old economy, we will bury you. *Business Week*. [Online]. [2001, May 4].
5.   Buss, D. 1996. The little guys strike back. *Nation's Business*. [Online], [2001, May 4].
6.   Chang, J., Ma, Y. Tsai, H.M. and Yur-Austin, Jasmine. 1999. An empirical examination of an emerging market's mutual fund performance. *Journal of Accounting and Finance Research* 7:72-82.
7.   Coy, P. 2000. The 21st century corporation the creative economy. *Business Week*. [Online]. [2001, May 4].
8.   Elfin expenditures: a look at fourth quarter spending. 2000. *Retail Merchandiser*. [Available: www.retailmerchandiser.com] [2001, May 4].
9.   Hyde, H. 2000. Oil Industry Competition. *FDCH Congressional Testimony*. [Online], [2001, May 4].
10.   Gaumnitz, Jack. 1971. Th influence of industry factors in stock price movements. *Working paper*, University of Kansas.
11.   Grinblatt, Mark and Titman, S. 1993. Performance measurement without benchmarks: An examination of mutual funds returns. *Journal of Business* 66:47-68.
12.   Jensen, M. 1968. The performance of mutual funds in the period 1945-1964. *Journal of Finance* 23:389-416.
13.   _____ 1969. Risk, and the pricing of capital assets, and the evaluation of investment portfolios. *Journal of Business* 42:167-247.
14.   King, Benjamin. 1966. Market and industry factors in stock price behavior. *Journal of Business* 39:139-190.
15.   Lee, C.F. and Rahman, S. 1990. Market timing, selectivity, and mutual fund performance: An empirical investigation. *Journal of Business* 63:261-278.
16.   Latane', Henry and Tuttle, Donald. 1968. Framework for forming probability beliefs. *Financial Analysts Journal* 24:51-61.
17.   Livingston, Miles. 1977. Industry movements of common stocks. *Journal of Finance* 32: 861-874.
18.   Meyers, Stephen. 1973. A re-examination of market and industry factors in stock price behavior. *Journal of Finance* 28: 695-705.
19.   Reilly, K. Frank. and Drzycimski, Eugene. 1974. Alternative industry performance and risk. *Journal of Financial and Quantitative Analysis* 9: 423-446.
20.   Reilly, K. Frank and Zeller, Thomas. 1974. An analysis of relative industry price-earnings ratios. *The Financial Review* 17-33.
21.   Roll, Richard. 1977. A critique of the asset pricing theory's test. *Journal of Financial Economics* 129-176.
22.   Selling, Thomas and Stickney, Clyde. 1983. The effects of business environment and strategy on firm's

rate of return on assets. *Financial Analysts Journal* 39: January - February.
23. _____. 1989. The effects of business environment and strategy on a firm's rate of return on assets. *Financial Analysts Journal 45: January* - February.
24. Sun chief advocates integrated systems. 2000. *Financial Times—Newswire*. [Online] [2001, May 4].
25. Tysseland, Mel. 1971. Further tests of the validity of industry approach to investment analysis. *Journal of Financial and Quantitative Analysis* 6:835-847.
26. Weekly retail gasoline prices. 2001. *Historical Energy Information Administration's National Energy Information Center (Online)* http://www.eia.doe.gov/oil_gas/petroleum/data_publications/weekly_ retail_gasoline_prices/wrgp_historical.html.

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