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Industry Affects Do Not Explain Momentum in Canadian Stock Returns

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Abstract

Similar to previous Canadian, US, and international studies, we find evidence of momentum in stock returns, using a Canadian sample over the 1981 to 1999 period. However, unlike recent US evidence provided by Moscowitz and Grinblatt (1999), we cannot attribute the majority of the excess returns produced by a stock momentum strategy to industry momentum. While we do find evidence that industry momentum strategies offer some potential for excess returns, these returns are well below those produced by a stock momentum strategy. In addition, the composition of our stock momentum portfolios with respect to industry momentum groups is not nearly as concentrated in "hot" (or "cold") industries as one would expect if industry factors were driving individual stock momentum. Finally, stock momentum portfolios continue to offer excess returns on a risk-adjusted basis, even after making adjustments for industry returns. In short, industry factors do not explain momentum in Canadian stock returns.

Key Words: Investments, Empirical, Market Anomaly, Market Efficiency.

1. Introduction

Momentum trading strategies have attracted a great deal of attention from academics and practitioners over the last decade in response to the seminal article of Jegadeesh and Titman (1993), who examined US stock returns over three decades. They documented the existence of very significant positive abnormal returns for an investment strategy that involved buying the top performing decile of US stocks and selling the bottom performing decile of stocks, where portfolios were formed by ranking stocks based on their past three- to 12-month returns. The existence of this medium-term persistence in stock returns has been confirmed in several subsequent US studies, and has also been shown to exist in Canadian and other global stock markets. This phenomenon has not gone unnoticed by practitioners, and over the past few years several fund companies have initiated so-called "momentum funds," many of which have achieved impressive results.

Despite several attempts to account for this pattern in stock returns, momentum remains one of the most important anomalies contradicting the notion of efficient markets. In fact, it is the one anomaly singled out by Eugene Fama as the most serious challenge posed by recent research to the notion of market efficiency[1]. However, many researchers agree that after accounting for the transaction costs associated with implementing such a high turnover trading strategy for individual stocks, much of the apparent excess profits would disappear. Recognizing this fact, recent studies have attempted to identify the contribution of industry momentum to the excess profits realized from a stock momentum strategy, which would allow practitioners to refine a momentum strategy that can be more efficiently implemented. More specifically, if picking the "hot industry" is a key component to the success of a momentum-based strategy, the strategy would become easier and more cost-effective to implement for both individual and institutional investors. This is a reasonable assertion since investors could use industry- or sector-based mutual funds to profit from momentum, or could purchase index participation unit products that are available on stock market industry sub-indices in both Canada and the US[2].

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[1] See "Efficient Market Hypothesis: Academics and Practitioners are Still at Odds," Susan Tramel, CFA Magazine Nov/Dec 2003.

[2] Sector index participation units (or exchange traded funds) provide investors with an additional cost advantage, since the management expense ratios (MERs) for these products are generally in the 0.10% to 0.30% range, well below the average MERs for traditional funds, which are in the 2.0 to 3.0% range.

A recent study of US stock returns by Moscowitz and Grinblatt (1999) found that the majority of the excess returns resulting from a stock momentum trading strategy could be attributed to industry momentum. A related study by O'Neil (2000) used sector mutual funds to show that excess returns could be produced using an industry momentum trading strategy. He found that winner portfolios outperformed loser portfolios by almost 15% annually, and they also generally outperformed the S&P 500 Index over the 10-year period; albeit at the expense of possessing more risk than the S&P 500. More recently, Grundy and Martin (2001) dispute the strength of the conclusions of Moscowitz and Grinblatt; although they do acknowledge that industry factors do affect momentum returns to a certain extent.

The studies above draw mixed conclusions about the importance of momentum in US industry returns. We provide new insight into this topic through the using Canadian data to examine the importance of industry momentum in Canadian stock returns over the 1981 to 1999 period. Similar to most previous Canadian and global evidence, we confirm the existence of medium-term persistence in Canadian stock returns. However, contrary to the US evidence provided by MG, we find little support for the notion that industry momentum can account for this pattern in stock returns. This contradiction is all the more surprising, given the fact that the US economy and its financial markets are much larger (and better developed) than Canada's, and therefore the opportunity set for US investors is much larger and more diversified across industry segments. For example, in some Canadian industries, there may be only four or five listed companies whose liquidity and size would make them suitable for many investors; while for the same industry in the US, investors could find hundreds of suitable companies in which to invest.

The remainder of this paper is organized as follows: Section 2 provides motivation for the present study; Section 3 describes our data and methodology; Section 4 presents the results; and Section 5 concludes.

2. Motivation

Considerable research has confirmed the existence of momentum in stock returns using data from the US, Canada, and other global markets. The US evidence is the most abundant, including studies by Jegadeesh and Titman (1993), and Chan, Jegadeesh and Lakonishok (1999). In a follow-up to their initial study, Jegadeesh and Titman (2001) used "out of sample" testing to re-evaluate their original momentum model in order to show that their 1993 results were not influenced by "data snooping." Using U.S. data from 1990 to 1998, they sound that their original model still produced excess returns during the new sample period, and that past winners still outperform past losers by about the same magnitude as in their 1993 study. This is striking evidence, since one would surmise that the attention devoted to this pattern in stock returns would have caused it to self-destruct, as investors attempted to exploit it.

Canadian evidence provided by Prihar, Foerster, and Schmitz (1994/95), and by Cleary and Inglis (1998) confirmed the existence of momentum in Canadian stock returns. Similar to US evidence, neither study found conclusive evidence that the excess returns could be attributed to the underlying risk of the strategy. Cleary and Inglis also showed that transaction costs would reduce the profitability of such strategies, making excess returns available only to those investors facing very low levels of transactions costs. Finally, Rouwenhorst (1998) extended the evidence to an international setting using samples from 12 non-US countries, and confirming that a stock momentum strategy was able to generate excess returns in all 12 countries. These results remained very strong even after adjusting for risk.

None of the existing studies has provided compelling evidence that this pattern may be attributed to the risk attributes of momentum trading strategies[1]. In fact, Grundy and Martin (2001) suggest that "the strategy's average profitability cannot be explained as a reward for bearing this dynamic exposure to the three factors of the Fama and French (1996) model, neither by cross-sectional variability in stocks' average retuns, nor by exposure to industry factors." On the other hand, implementing a momentum strategy using individual stocks entails high portfolio turnover,

[1] It is the only previously documented stock return anomaly that Fama and French (1996) cannot account for using their three factor model.

and therefore, high transactions costs. As mentioned in the introduction, the resulting trading costs could be reduced substantially if a momentum strategy could be implemented using industry portfolios, as opposed to using individual stocks.

It is reasonable to surmise that industry momentum could have a significant impact on individual stock return patterns, since industries tend to fall in and out of favor with investors on a regular basis. For example, when considering the behavior of the stock market over the past few years, one could not help but notice the phenomenal returns provided by many stocks in the high-technology sector up until March 2000; and the subsequent "free-fall" in their prices in the months thereafter. Prior to the technology "boom", there were excellent returns provided by stocks dubbed as "junior mining" stocks. Thus, it is logical for investors to consider the possibility of exploiting such patterns in industry returns.

Despite the intuitive relationship between industry factors and momentum in stock returns, the 1999 study by Moscowitz and Grinblatt represented the first notable attempt to address this issue. Based on US evidence, they concluded that the majority of the excess returns resulting from a stock momentum trading strategy could be attributed to industry momentum. They divided their sample into 20 industry groups based on the stock's associated Standard Industry Classification (SIC) code, and then formed portfolios of winners and losers based on the performance of the industry groupings. The "winners" portfolio was comprised of the top three performing industries from the lag period under consideration, while the "losers" portfolio was comprised of the bottom three industries. They constructed portfolios consisting of a long position in the winners and a short position in the losers. They found that a six-month lag period followed by a six-month hold period resulted in the largest excess returns (approximately 0.43% per month), with the majority of the excess returns resulting from the long position in the winners. They also found that an individual stock momentum trading strategy produced excess returns. However, after deducting the associated industry return from the individual stock return, the excess returns produced by the stock momentum trading strategy disappeared. They concluded that the excess returns generated by a stock momentum trading strategy, was primarily attributable to industry momentum.

O'Neil (2000) also addressed the issue of medium-term persistence in industry returns, using sector mutual funds to show that excess returns could be produced using an industry momentum trading strategy. He found that winner portfolios outperformed loser portfolios by approximately 15% annually. In addition, the winner portfolios generally outperformed the S&P 500 over the 10-year period; however, they did present more risk. As mentioned previously, Grundy and Martin (2001) also examined the influence of industry factors and concluded that it is "premature" to conclude that industry influences can account for stock return momentum. Thus, this issue is far from settled based on US evidence, and has yet to be confirmed or refuted using non-US evidence.

The discussion above suggests that momentum in stock returns is a global phenomenon. US evidence provides mixed signals regarding the influence that industry momentum may have on this pattern in individual stock returns; while there exists little (or no) non-US evidence regarding this issue. The purpose of the present study is to provide Canadian evidence on the subject.

3. Data and Methodology

Sample Description

Stock price and monthly stock return data were collected for stocks listed on the Toronto Stock Exchange (TSX) between January 1980 and December 1999 that were included in the Canadian Financial Markets Research Centre (CFMRC) database (formerly the TSE-Western database). After eliminating missing observations, we were left with data for 763 companies. SIC codes were obtained from the Research Insight (Compustat-Canadian) database. When the information from both databases was matched-up, we were left with data for 716 companies; although there were still a number of missing observations in the time series for the remaining companies. In addition, it was necessary for firms to have at least six consecutive months of data for a given portfolio formation period to be included in one of the "momentum" portfolios constructed at that point in time.

All stocks are allocated to one of the following 10 industry groups according to SIC code:

Group	Description and Range of SIC Codes
1	Mining
	SIC Codes 1000-1499
2	Food and Apparel
	SIC Codes 2000-2399
3	Paper, Chemical, and Petroleum
	SIC Codes 2600-2699, 2800-2999
4	Primary and Fabricated Metals
	SIC Codes 3300-3499
5	Machinery, Transport, and Electrical Equipment; Manufacturing
	SIC Codes 3500-3999
6	Railroads and Other Transportation
	SIC Codes 4000-4799
7	Utilities
	SIC Codes 4900-4999
8	Department Stores and Other Retail
	SIC Codes 5000-5999
9	Financials
	SIC Codes 6000-6999
10	Other
	SIC Codes of all others not included in the above classifications

Unfortunately, we had to combine some similar industry groups (such as Department Stores and Other Retail) in order to ensure a reasonable number of firms in each industry group. As a result, we were unable to construct 20 industry portfolios, as in Moscowitz and Grinblatt (1999). While we recognize this may impact our results, as well as the validity of any direct comparison with the Moscowitz and Grinblatt (1999) results, data contraints left us with no other choice. For example, during the 1980s, there were only two firms classified as department stores; however, there were over 20 retail stores, so combining these two industry groups ensured we had over 20 firms in the group at all times. Thus, combining the two groups seemed to be a reasonable compromise, given the similarities between the industries.

Methodology

Our portfolios were constructed based on returns over the previous six-month portfolio formation (lag) periods, and performance was evaluated during the subsequent six-month holding periods. This is consistent with the approach of Moscowitz and Grinblatt (1999), as well as Jegadeesh and Titman (1993). Portfolio returns are calculated using both equal-weighted and value-weighted approaches. Similar to previous research, we make use of a self-financing portfolio that is constructed by taking a long position in the top performing group during the lag period, and taking a short position in the worst performing group. We also report the results for holding the top-three industries, and short selling the bottom-three. Finally, in order to examine individual stock momentum, the top 30 and bottom 30 performing stocks during the lag period were assigned to winner and loser portfolios, respectively.

We report traditional risk and return measures of performance including the Sharpe ratio, the Treynor ratio, beta, standard deviation, and average return. These measures were also determined for the TSE 300 Composite Index, and for Government of Canada T-Bills for comparison purposes.

The final portion of this study focuses on identifying whether the source of the excess returns realized from a momentum strategy is the result of industry momentum or the momentum of the stocks themselves. As a preliminary step, we examine the industry composition of the top 30 and bottom 30 stock momentum portfolios. We proceed to make adjustments to the stock momen-

tum portfolio returns. First we deduct the associated industry return from each stock's return, as in Moscowitz and Grinblatt (1999). However, this approach also eliminates the systematic (or market) portion of the return earned by the stock, so we add back the market return (as measured by the return on the TSE 300)[1]. We believe this approach is a better indicator of the impact of industry momentum on individual stock excess returns, since it results in a deduction of the associated industry return that is in excess of the market return.

4. Results

Table 1 provides summary statistics for the 10 industry groups based on SIC codes. The results presented in this table are those that would have been realized if each industry group had been held for the entire 20-year period under study. The average returns (both value- and equal-weighted) for three of the 10 industry groups were above that of the TSE 300. Additional two industry groups had an average value-weighted return above that of the TSE 300, while another group had an average equal-weighted return above the TSE 300. Based on the value-weighted returns, an investor who randomly selected an industry group to buy and hold, would have had a 50% chance of realizing returns above those of the TSE 300, versus a 40% chance if they maintained an equal-weighted industry portfolio selected on a random basis. The Sharpe and Treynor ratios presented in Table 1, show that all of the industry groups with average returns (either value- or equal-weighted) above that of the TSE 300 also produced risk-adjusted performance in excess of those produced by the TSE 300.

Panel A of Table 2 presents performance statistics for the industry momentum portfolios during the six-month portfolio formation (lag) period. Panel B of Table 2 presents their performance during the subsequent six-month holding period. Panel B shows that the top performing, as well as the top three performing industry groups (as ranked during the lag period) outperformed the TSE 300 in the subsequent holding period in terms of their average returns, Sharpe ratios, and Treynor ratios, using both value-weighted and equal-weighted returns. In contrast, the bottom industry and the bottom three industry portfolios continued to underperform during the hold period. Similar to the results in Moscowitz and Grinblatt (1999), the evidence indicates the existence of industry momentum, with positive returns being earned by the self-financing portfolios that are formed by holding the top industry group(s) and short selling the bottom industry group(s). Interestingly, the excess returns identified in the US study were considerably larger than in our study, yielding an average six month excess return (above the riskless rate) of 2.58%, versus our average excess return of 0.42%.

Panel A of Table 3 shows the summary financial data for the individual stock momentum portfolios during the six-month portfolio formation period. Panel B of Table 3 outlines the results of the stock momentum strategy during the hold periods. Holding the "top 30" portfolio produced results on a value-weighted and equal-weighted basis that were far superior to those produced by the TSE 300. The self-financing portfolio also produced excess returns. When the risk associated with the momentum portfolios was taken into consideration, the top 30 portfolio and the self-financing portfolios both produced large and positive Sharpe ratios that were more than twice those reported for the TSE 300 Index[2].

[1] This approach implicitly assumes that the average portfolio has a beta of one, which will tend to be the case for large numbers of observations.

[2] The Treynor ratios for the self-financing portfolios were uninformative, since these portfolios had small negative betas; however, the returns were well above the TSE 300 and the betas were obviously much lower.

Table 1

Industry Groups Summary Statistics (1980-1999)
(6-month returns)

	1	2	3	4	5	6	7	8	9	10	TSE 300	T-Bills
Mean return VW	4.25%	5.87%	4.02%	8.03%	8.05%	4.74%	7.73%	7.89%	8.24%	4.64%	6.10%	4.31%
Mean return EW	5.16%	5.58%	3.88%	5.93%	7.12%	5.94%	4.31%	8.50%	8.69%	6.73%	6.10%	4.31%
Std Deviation VW	0.252	0.161	0.167	0.179	0.151	0.201	0.121	0.133	0.172	0.184	0.132	0.020
Std Deviation EW	0.280	0.152	0.147	0.178	0.200	0.210	0.125	0.185	0.196	0.175	0.132	0.020
Beta VW	1.436	0.999	0.981	1.144	0.769	0.979	0.741	0.820	1.081	1.114	1.000	-0.021
Beta EW	1.619	0.857	0.876	1.086	1.028	1.181	0.707	1.089	1.262	1.152	1.000	-0.021
Avg Portfolio Size ($millions)	191,427	84,308	258,102	124,575	374,715	71,544	56,105	73,822	337,969	278,719	n/a	n/a
Avg Share Price ($)	7.044	18.992	17.334	19.010	13.456	16.027	16.814	13.459	19.077	15.185	n/a	n/a
Median Share Price ($)	3.6	14	10.875	17.5	8.5	11	17	11.25	12.1	12	n/a	n/a
Sharpe Ratio VW	-0.002	0.097	-0.017	0.208	0.248	0.022	0.283	0.270	0.228	0.018	0.135	0.000
Sharpe Ratio EW	0.030	0.083	-0.030	0.092	0.140	0.077	0.000	0.226	0.224	0.139	0.135	0.000
Treynor Ratio VW	-0.000	0.016	-0.003	0.033	0.049	0.004	0.046	0.044	0.036	0.003	0.018	0.000
Treynor Ratio EW	0.005	0.015	-0.005	0.015	0.027	0.014	0.000	0.038	0.035	0.021	0.018	0.000

Table 2

Industry Momentum Portfolio Performance
Panel A: During the Formation Period (1980-1999) (6-month returns)

The column labeled "Top-Bot." is a self-financing portfolio where the Top (or Top 3) industry (industries) is (are) held and the Bottom (or Bottom 3) industry (industries) is (are) sold short.

	Top Industry	Bottom Industry	Top-Bot.	Top 3 Industry	Bottom 3 Industry	Top-Bot.	TSE 300	T-Bills
Mean return VW	24.23%	-10.19%	34.42%	17.77%	-4.81%	22.58%	6.10%	4.31%
Mean return EW	24.39%	-10.10%	34.49%	17.83%	-4.94%	22.77%	6.10%	4.31%
Std Deviation VW	0.228	0.130	0.171	0.169	0.123	0.088	0.132	0.020
Std Deviation EW	0.241	0.135	0.160	0.192	0.132	0.096	0.132	0.020
Beta VW	1.547	0.801	0.746	1.211	0.865	0.346	1.000	-0.021
Beta EW	1.522	0.866	0.656	1.265	0.922	0.343	1.000	-0.021
Avg Portfolio Size VW ($millions)	170,550	172,550	-2,000	510,386	512,386	-2,000	n/a	n/a
Avg Portfolio Size EW ($millions)	181,854	145,241	36,613	525,099	507,731	17,368	n/a	n/a
Average Share Price VW ($)	14.30	16.78	15.54	15.04	15.33	15.19	n/a	n/a
Average Share Price EW ($)	15.24	14.13	14.69	15.47	15.19	15.33	n/a	n/a
Median Share Price VW ($)	12.25	13.36	13.12	11.63	11.00	11.42	n/a	n/a
Median Share Price EW ($)	11.13	10.88	11.05	11.94	11.25	11.50	n/a	n/a
Sharpe Ratio VW	0.872	-1.117	1.759	0.799	-0.743	2.076	0.135	0.000
Sharpe Ratio EW	0.833	-1.067	1.881	0.705	-0.699	1.920	0.135	0.000
Treynor Ratio VW	0.129	-0.181	0.404	0.111	-0.105	0.529	0.018	0.000
Treynor Ratio EW	0.132	-0.166	0.460	0.107	-0.100	0.539	0.018	0.000

Panel B: During the Holding Period (1980-1999) (6-month returns)

	Top Industry	Bottom Industry	Top-Bot.	Top 3 Industries	Bottom 3 Industries	Top-Bot.	TSE 300	T-Bills
Mean return VW	7.41%	2.98%	4.43%	7.98%	4.65%	3.32%	6.10%	4.31%
Mean return EW	7.42%	0.90%	6.52%	7.32%	4.44%	2.88%	6.10%	4.31%
Std Deviation VW	0.168	0.182	0.176	0.153	0.168	0.114	0.132	0.020
Std Deviation EW	0.190	0.195	0.137	0.166	0.173	0.106	0.132	0.020
Beta VW	1.000	0.973	0.028	1.072	1.130	-0.058	1.000	-0.021
Beta EW	1.208	1.196	0.012	1.106	1.105	0.001	1.000	-0.021
Avg Portfolio Size VW ($millions)	163,759	170,354	-1,946	500,197	502,178	-1,981	n/a	n/a
Avg Portfolio Size EW ($millions)	189,096	147,090	37,605	535,582	513,017	17,534	n/a	n/a
Average Share Price VW ($)	14.11	16.73	14.68	15.16	15.39	15.27	n/a	n/a
Average Share Price EW ($)	15.25	14.06	14.65	15.53	15.12	15.32	n/a	n/a
Median Share Price VW ($)	12.13	10.93	11.88	11.31	10.94	11.25	n/a	n/a
Median Share Price EW ($)	11.50	10.88	11.25	11.23	11.00	11.13	n/a	n/a
Sharpe Ratio VW	0.184	-0.073	0.007	0.239	0.020	-0.087	0.135	0.000
Sharpe Ratio EW	0.164	-0.174	0.161	0.182	0.008	-0.134	0.135	0.000
Treynor Ratio VW	0.031	-0.014	0.045	0.034	0.003	0.169	0.018	0.000
Treynor Ratio EW	0.026	-0.028	1.796	0.027	0.001	-16.825	0.018	0.000

Table 3

Stock Momentum Portfolio Performance

The column labeled "Top-Bot." is a self-financing portfolio where the Top 30 stocks are held and the Bottom 30 are sold short.

Panel A: During the Formation Period (1980-1999) (6-month returns)					
	Top 30 Stocks	Bottom 30 Stocks	Top-Bot.	TSE 300	T-Bills
Mean return VW	69.10%	-34.22%	103.32%	6.10%	4.31%
Mean return EW	88.83%	-38.90%	127.72%	6.10%	4.31%
Std Deviation VW	0.521	0.182	0.603	0.132	0.020
Std Deviation EW	0.555	0.173	0.631	0.132	0.020
Beta VW	1.515	0.665	0.850	1.000	-0.021
Beta EW	1.276	0.693	0.582	1.000	-0.021
Avg Portfolio Size VW ($millions)	13,583	5,285	8,299	n/a	n/a
Average Share Price ($)	15.50	5.56	10.53	n/a	n/a
Median Share Price ($)	10.25	3.00	5.75	n/a	n/a
Sharpe Ratio VW	1.243	-2.113	1.641	0.135	0.000
Sharpe Ratio EW	1.524	-2.497	1.957	0.135	0.000
Treynor Ratio VW	0.428	-0.579	1.165	0.018	0.000
Treynor Ratio EW	0.663	-0.623	2.120	0.018	0.000
Panel B: During the Holding Period (1980-1999)					
	Top 30 Stocks	Bottom 30 Stocks	Top-Bot.	TSE 300	T-Bills
Mean return VW	20.76%	5.99%	14.76%	6.10%	4.31%
Mean return EW	12.86%	1.62%	11.25%	6.10%	4.31%
Std Deviation VW	0.312	0.234	0.307	0.132	0.020
Std Deviation EW	0.201	0.218	0.235	0.132	0.020
Beta VW	1.139	1.221	-0.082	1.000	-0.021
Beta EW	0.930	1.066	-0.136	1.000	-0.021
Avg Portfolio Size VW ($millions)	16,462	6,302	10,160	n/a	n/a
Average Share Price ($)	17.41	6.53	11.92	n/a	n/a
Median Share Price ($)	12.00	3.20	7.10	n/a	n/a
Sharpe Ratio VW	0.527	0.072	0.340	0.135	0.000
Sharpe Ratio EW	0.426	-0.124	0.296	0.135	0.000
Treynor Ratio VW	0.144	0.014	-1.271	0.018	0.000
Treynor Ratio EW	0.092	-0.025	-0.510	0.018	0.000

Table 3 confirms the existence of stock momentum in Canada over the 1980 to 1999 period, which is consistent with previous evidence over earlier periods. More important for the purposes of this study, is that the results in Table 2 and Table 3, show that the returns produced by the stock momentum strategy are superior to those produced by the industry momentum strategy, both on a raw return basis and on a risk-adjusted basis. In particular, the top 30 stock portfolio produced much higher returns, and produced Sharpe ratios that were almost three times as large as those for the top-industry and top 3-industry portfolios, and Treynor ratios that were about four to five times as large. Largely as the result of this superior performance by the past winners, the self-financing stock momentum portfolios similarly outperformed those for the industry momentum portfolios by a wide margin.

The superiority of individual stock momentum over industry momentum that we document contrasts with the US results provided by Moscowitz and Grinblatt (1999), who found their

returns were similar in magnitude for stock or industry based momentum strategies. This suggests that industry momentum may not play as big a role in the success of Canadian stock momentum strategies as it does in the US. Table 4 provides additional evidence supporting this assertion.

Table 4

Composition of Stock Momentum Portfolios

The composition of the momentum portfolios is described as a percentage of stocks belonging to each industry momentum ranking.

Industry Momentum / Ranking	Top 30 Portfolio	Bottom 30 Portfolio
1	11.86%	6.40%
2	13.83%	9.99%
3	8.40%	5.53%
4	10.57%	8.44%
5	11.76%	8.34%
6	8.30%	9.21%
7	10.47%	10.09%
8	8.99%	9.99%
9	7.31%	13.77%
10	8.50%	18.23%

Table 4 outlines the composition of the portfolios used in the stock momentum strategy relative to the ranking of the stock's associated industry momentum group during the holding period. If industry momentum is the main contributor to the excess returns realized from the stock momentum strategy, we would expect the composition of the top 30 portfolio to be concentrated in the top-rated industry momentum groups, and would expect the bottom 30 portfolio to be concentrated in the lower ranked industry momentum groups. On the other hand, if there is no industry effect, we would expect approximately 10% from each industry momentum portfolio. Table 4 shows that stocks from industry groups one and two account for approximately 25% of the stocks in the top 30 portfolio, while stocks from industry groups nine and 10 account for approximately 32% of the stocks from the bottom 30 portfolio. While these figures show a concentration in the expected areas, the concentration is not nearly as pronounced as one would expect if industry momentum were a major source of individual stock momentum, especially for the top 30 stock portfolio. For example, the top 30 portfolio is comprised of approximately 25% of stocks from industry momentum groups eight, nine and 10; while the bottom 30 portfolio consists of about 22% of stocks from industry groups one, two and three. While this is only summary-type evidence it clearly suggests that industry momentum cannot, by itself, account for individual stock momentum.

Table 5 shows the results of the adjustments to the returns (as outlined in the methodology portion of this paper) generated by the stock momentum strategy. In particular, we examine if industry momentum is the source of the excess returns produced using an individual stock momentum strategy, by adjusting the stock returns by the corresponding industry return. Panel A reports the results for equal-weighted portfolios, while Panel B reports the value-weighted results. The first three columns present the results when the appropriate raw industry returns are subtracted from the returns of the stocks included in the momentum portfolios; while the next three columns present results when the appropriate excess industry returns (above the TSE 300 returns) are subtracted.

Table 5

Adjusted Returns for Stock Momentum Portfolios

Panel A: Adjusted Returns on an Equally-Weighted Basis								
	Stock Returns less Industry Returns			Stock Returns less Excess Industry Returns				
	Top 30 Stocks	Bottom 30 Stocks	Self-Financing	Top 30 Stocks	Bottom 30 Stocks	Self-Financing	T-Bill Return	TSE 300
Mean	0.064	-0.036	0.099	0.126	0.025	0.100	0.043	0.061
Median	0.034	-0.039	0.077	0.108	-0.016	0.077	0.042	0.080
Sharpe	0.143	-0.492	0.254	0.489	-0.092	0.258	0.000	0.135
Treynor	-0.076	0.521	-0.470	0.115	-0.021	-0.444	0.000	0.018
Panel B: Adjusted Returns on a Value-Weighted Basis								
	Stock Returns less Industry Returns			Stock Returns less Excess Industry Returns				
	Top 30 Stocks	Bottom 30 Stocks	Self-Financing	Top 30 Stocks	Bottom 30 Stocks	Self-Financing	T-Bill Return	TSE 300
Mean	0.074	-0.037	0.111	0.136	0.024	0.112	0.043	0.061
Median	0.029	-0.075	0.106	0.097	0.019	0.106	0.042	0.080
Sharpe	0.189	-0.343	0.222	0.456	-0.057	0.224	0.000	0.135
Treynor	-0.429	-0.074	-0.059	0.101	-0.009	-0.059	0.000	0.018

This table shows the effects on the returns produced by the stock momentum portfolios of deducting each stock's associated industry return and "excess" industry return during the hold period. Excess industry return is defined as the return of the industry less the return of the market (TSE 300).

Table 5 shows that the Top 30 portfolio, as well as the self-financing (Top-Bottom) portfolio offer higher returns and produce higher Sharpe ratios than the TSE 300 Index, while the Bottom 30 portfolio underperforms the TSE 300 based on these measures. The Treynor measures are negative (and uninformative) for these portfolios when total industry returns are subtracted, since the resulting beta is small (approximately zero) and negative, as one would expect[1]. In short, the results presented in Table 5 demonstrate that the stock momentum portfolios outperform the TSE 300, even after adjusting for industry momentum. This is the case whether the adjustment accounts for raw industry returns, or excess industry returns. As one would expect, the results for the top 30 portfolios are stronger when we adjust using excess industry returns. However, the results for the self-financing portfolios are virtually identical under either adjustment, reflecting the more severe underperformance of the bottom 30 portfolios when they are adjusted by raw industry returns.

5. Conclusions

Similar to previous Canadian, US, and international studies, we find evidence of momentum in stock returns, using a Canadian sample over the 1981 to 1999 period. However, unlike recent US evidence provided by Moscowitz and Grinblatt (1999), we cannot attribute the majority of the excess returns produced by a stock momentum strategy to industry momentum. While we do find evidence that industry momentum strategies offer some potential for excess returns, these returns are well below those produced by a stock momentum strategy. In addition, the composition of our stock momentum portfolios with respect to industry momentum groups is not nearly as concentrated in “hot” (or “cold”) industries as one would expect if industry factors were driving individual stock momentum. Finally, stock momentum portfolios continue to offer excess returns on a risk-adjusted basis, even after making adjustments for industry returns.

[1] The small, negative betas (approximately zero) are expected when we subtract industry returns (that include market returns) because all that is left is the unique, company-specific portion of the stock return, which by nature should be unrelated to market returns.

In short, industry factors do not explain momentum in Canadian stock returns, which differs from the recent US evidence provided by Moscowitz and Grinblatt (1999); however, it supports the arguments of Grundy and Martin (2001). The difference in results from those of Moscowitz and Grinblatt (1999) may be partially attributable to the fact that we were only able to form 10 industry groups, versus the 20 groups they formed. However, it is also reasonable to conjecture that many of the factors identified by previous studies (such as earnings momentum, time-varying risk premia, market sentiment, and investor "habit"), as well as factors not yet identified, all contribute to the profitability of stock momentum strategies.

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