

Introduction

In this paper, we investigate seasonality in stock returns over the past five decades in Canada (1961 to 2010) and also shed light on some conventional folklore about investment timing. The motivation for this paper is the possibility of dynamic/changing seasonality in recent years (e.g. Doyle and Chan, 2009) indicating that previously documented seasonal anomalies may have changed over time. As a result, we believe that investigating the implications of seasonality, including the January effect, along with some folklore about the “doldrums of summer” may provide evidence on whether or not seasonality in the Canadian stock market has changed over the years.

Related Literature

Several earlier studies have documented the presence of monthly seasonality like the January effect (see Rozeff and Kinney, 1976; Schultz, 1985; etc. for U.S. results and Jog and Riding (1989, 1990) and Jog (1988) for the Canadian stock market findings). However, papers such as Lakonishok and Smidt (1988) have shown that months that performed well in one sub period (e.g. a specific decade) are not, in general, months that performed well in other sub periods. The conclusion is that there may not be any consistent monthly (seasonal) pattern in the stock market. In this paper, we investigate seasonality using a longer time series (five decades) of data.

Data and Methodology

The data used in this study is the monthly total returns (price plus dividends) data for the TSX 300 Index from 1961 to 2010, downloaded from the CFMRC database and supplemented with 2010 monthly total return data from the TSX e-Review. The T-Bill rates are obtained from Bank of Canada.

Results

Monthly Seasonality

In this section, we present monthly patterns of the TSX 300 monthly total returns from 1961 to 2010 (Table 1). The intent is to determine if annual returns are influenced by a specific month or two within a year.

Month	Avg Return	Min Return	Max Return	Std Dev	Median Return	Neg Ret Count	Pos Ret Count	% Neg	% Pos	Sharpe ratio
January	2.0%	-8.4%	16.5%	5.1%	2.6%	19	31	38%	62%	0.21
February	0.7%	-13.3%	8.5%	4.0%	0.7%	21	29	42%	58%	-0.05
March	1.2%	-17.6%	7.8%	4.5%	1.2%	19	31	38%	62%	0.06
April	1.0%	-8.9%	9.2%	3.9%	1.3%	19	31	38%	62%	0.01

Month	Avg Return	Min Return	Max Return	Std Dev	Median Return	Neg Ret Count	Pos Ret Count	% Neg	% Pos	Sharpe ratio
May	1.0%	-9.6%	11.5%	4.0%	1.8%	19	31	38%	62%	0.02
June	-0.1%	-10.4%	10.4%	4.1%	0.2%	23	27	46%	54%	-0.24
July	1.0%	-7.5%	7.9%	3.7%	1.6%	18	32	36%	64%	0.03
August	0.7%	-20.1%	14.7%	5.2%	0.9%	21	29	42%	58%	-0.04
September	-0.7%	-14.4%	6.7%	4.7%	-0.1%	25	25	50%	50%	-0.34
October	-0.3%	-22.5%	10.9%	6.0%	0.8%	23	27	46%	54%	-0.20
November	1.7%	-10.9%	9.7%	4.8%	2.6%	16	34	32%	68%	0.17
December	2.7%	-5.1%	11.9%	3.1%	2.5%	6	44	12%	88%	0.57
All Months	0.9%	-22.5%	16.5%	4.5%	1.3%	229	371	38%	62%	0.00

Table 1: Monthly seasonality in Total Returns

From the results above, there appears to be some monthly seasonal patterns on the Canadian stock market. The means and medians of January, November and December are all higher than the average of all the months combined. On the other hand, the September mean and median values are lower (and negative) compared to the mean of all the months combined, indicating that September is on average a wealth-destructive month on the Canadian stock market. Also, since mean returns of June, July, August and September have been either lower than or close to the overall monthly average of 0.9%, it can be inferred that the folklore about the doldrums of summer seem to be valid in the Canadian stock market.

Quarterly Seasonality

To understand the implications of the monthly seasonality on investor wealth, we construct four three month investment periods: (i) Q1 made up of February, March and April, (ii) Q2 made up of May, June and July, (iii) Q3 made up of August, September and October, and, (iv) Q4 made up of November, December and January.

This unique view of seasonality led to some interesting results. The most revealing finding is that Q4 (Nov-Dec-Jan) is the highest wealth-creating quarter for every single year from 1961 to 2010. The Q4 average return is 6.5% compared to the global quarterly average of 2.8%. The Box and Whisker chart (Figure 1) below provides more descriptive information about the nature of quarterly seasonality in Canada.

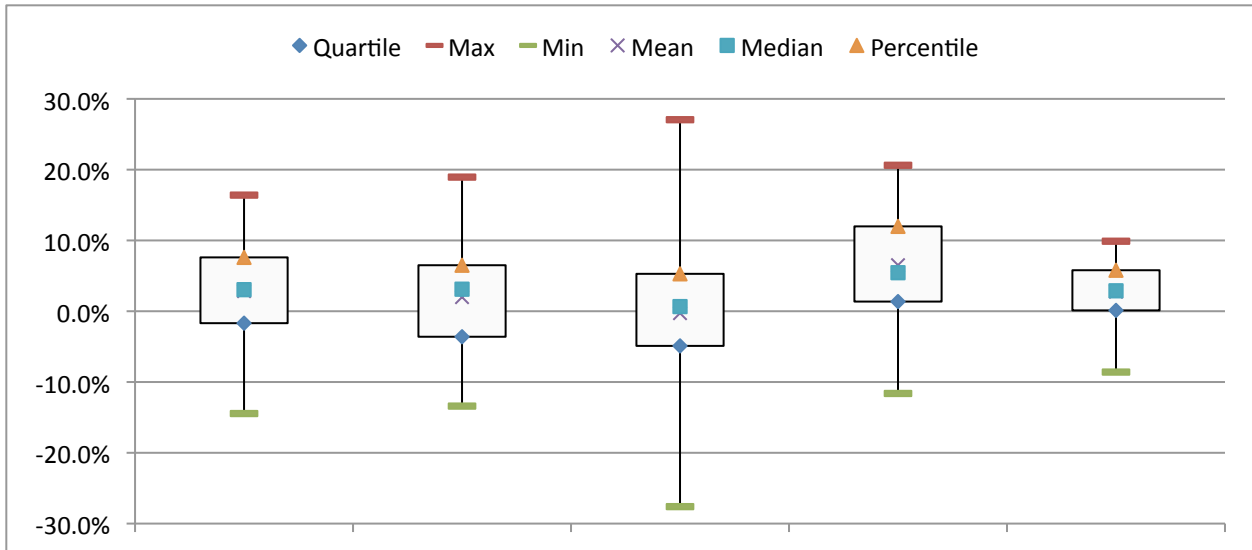


Figure 1: Box plot of Quarterly Seasonality

In addition to having the largest mean (6.5%) and median (5.4%), Figure 1 demonstrates that Q4 is the only quarter having both the quartile (1.4%) and percentile (12%) being positive. On the other hand, the mean returns of Q1 (2.8%), Q2 (2%) and Q3 (-0.3%) lag the mean returns of Q4 (6.5%). The other three quarters also lag Q4 on other metrics such as median, percentile, quartile, and proportion of quarterly returns that are negative. Q3 not only has the lowest average return, it is also the most volatile quarter. Figure 2 graphically demonstrates the wealth impact of a dollar investment by investing in each of the four quarters over this fifty-year period.

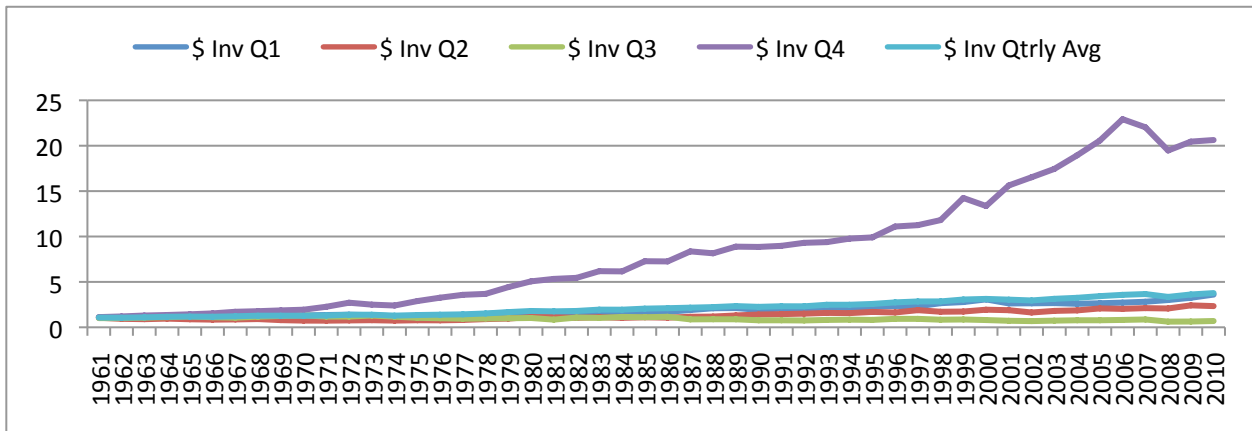


Figure 2: Dollar Investments in Q1, Q2, Q3, Q4 and the Overall Quarterly Average

As can be seen, a dollar invested at the beginning of Q4 (November – January) would have grown to \$20.6 in 2010.¹ This is significantly higher than investing in the beginning of Q1 (which would have grown to \$3.6), Q2 (which would have grown to \$2.3), Q3 (which would have shrunk to \$0.7), and the overall quarterly average would have been \$3.8 in 2010. More importantly, although not shown here, Q4 generated higher returns than any other quarter in every year for the last fifty years. It is evident that the wealth creation implications of Q4 (November-December-January) are significant and that there is considerable economically significant seasonality.²

Implications for Institutional Investors

Given that Q4 turns out to be the best time to be invested in the stock market and since (institutional) investors need to be invested year round, we examined four investment strategies that combine being invested in the stock market in each of the four quarters while being invested in T-Bills in the other three quarters. To provide a baseline, we also investigated strategies of being invested in stocks all year round and being invested in T-Bills all year round. Figure 3 summarizes the results of these six strategies.

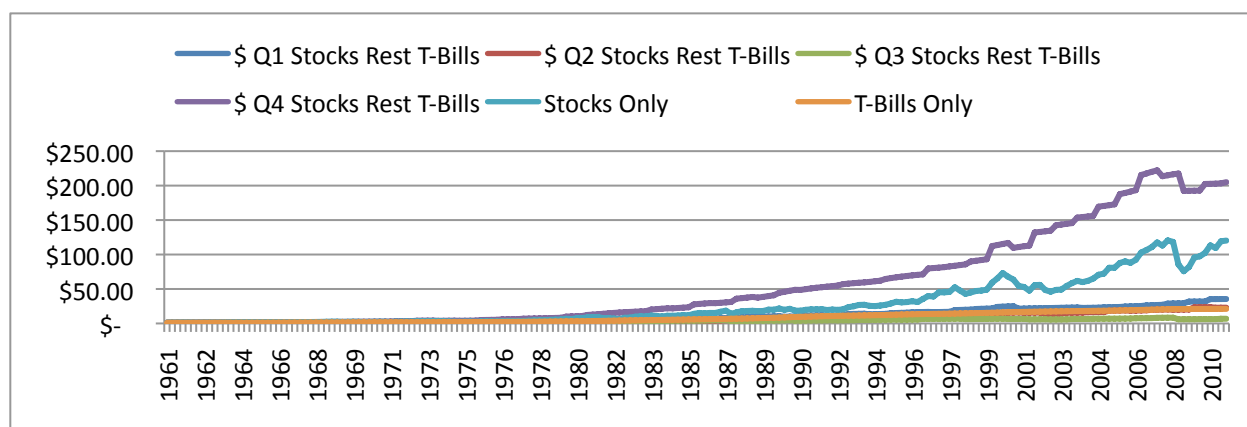


Figure 3: Dollar Investments in Six Strategies

As evident from the chart, the strategy of being invested in the stock market in Q4 and in T-Bills for the rest of the year (Q4 strategy) results in the highest wealth creation. A dollar invested in this strategy in 1961 would have grown to \$205.02 in 2010. Alternatively, a dollar invested in stocks in 1961 and every year thereafter in Q1 and in T-Bills in the rest of the year (Q1 strategy) would have grown to \$35.45 in 2010. The Q2 and Q3 strategies would have respectively resulted in \$22.90 and a paltry \$6.82 at the end of 2010.

Also, in comparison to our two baseline strategies of investing in stocks or in T-Bills all year round, we find that the Q4 (investment in stocks) strategy beats both baseline strategies as well. A dollar invested

¹ This assumes that the investor has a choice to invest only for three months in the year.

² Although not shown here, we also tested statistical significance of these results. Q4 returns were statistically significantly higher in the first three decades but not so in the last two decades, although they were the highest of any quarter.

in stocks all year round (in 1961) would have grown to \$120.25 in 2010 while a dollar invested in T-Bills would have grown to \$21.13 over the same period. Both of these strategies significantly underperform the Q4 strategy's terminal wealth of \$205.02.

All in all, the key takeaway for institutional (and other) investors is to stay invested in the stock market in Q4 and in T-Bills in the other three quarters (i.e. Q1, Q2 and Q3). This strategy yields the best wealth creation compared to the three other Q strategies plus the two baseline strategies that we have evaluated.

Conclusions

This paper provides evidence of seasonality in the Canadian stock market over the past five decades. We show that significant wealth is created from a strategy of being invested in the stock market in the months of November, December, and January and in T-bills for the rest of the year (Q4 Strategy). Alternatively, the worse strategy is to invest only in the months of August, September, and October (Q3 strategy). Not only that, the Q4 strategy beats a passive buy and hold strategy of being invested in the stock market on a year around basis.

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