Seasonal Patterns in Canadian Financial Markets and the Impact of Professional Portfolio Rebalancing: Evidence of Profitable Opportunities

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ABSTRACT

Using Canadian data for the period 1957-2003, this paper provides evidence in support of the gamesmanship hypothesis. We document strong seasonality in (excess) returns of Canadian stock and government bond indices. However, the seasonality in the returns of the Canadian government bond index is opposite in direction from that of the Canadian stock indices**.** Seasonal strength is observed in equities, especially smaller stocks at the beginning of the year, with the rest of the year, especially the second half of the year, showing widespread weakness in relation to January. The opposite is true for government of Canada bonds, as the gamesmanship hypothesis would predict. In addition, this paper provides support of the popular expression "Sell in May and Go Away", as the average performance of risky securities is higher in the November to April period than the May to October period. The opposite is true for government of Canada bonds. There is also support for the motto "As January Goes, so Goes the Year" and the predictive power of the January returns. Support for these popular expressions is also consistent with the gamesmanship hypothesis. Moreover, not only does this study examine the seasonal behavior of security returns (i.e., an indirect test of gamesmanship hypothesis), but data are also provided that enable us to observe directly the trading behavior of institutional investors, thus complementing the indirect tests of the gamesmanship hypothesis. We find that the stock and government of Canada bond flow of funds data employed for the direct tests of the gamesmanship hypothesis exhibit seasonality which mirrors the seasonality in the returns of stocks and government bonds, thus substantiating and consolidating the support for the gamesmanship hypothesis. The paper's findings will be useful not only to institutional investors, but also to individual investors. Understanding the seasonal behavior of financial markets and the inefficiencies bestowed upon them by institutional factors will help investors secure higher returns and better retirement. Moreover, this paper's support of the gamesmanship hypothesis is in line with the argument in favor of agency related factors as the key drivers of the so called value premium, namely that value stocks beat growth stocks.

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I. Introduction

How much truth does the popular expression "Sell in May and Go Away" have?[1] How about the motto "As January Goes, so Goes the Year" and the predictive power of January returns?[2] Moreover, if the returns of risky securities, such as stocks, exhibit seasonal patterns, how do the returns of risk-free securities, such as government bonds, behave throughout the year? Are seasonal patterns in security returns interlinked? If such patterns exist, what drives them and are there profitable opportunities arising from such behavior of financial securities? This paper purports to investigate and address these questions.

There has been much research in recent years to indicate that there is a distinct seasonal pattern in the equity markets around the world (see Gultekin and Gultekin (1983), Athanassakos (2002), Bouman and Jacobsen (2002), Ogden (2003), L'Her, Masmoudi and Suret (2004)). Similarly, research has shown that the returns of high risk corporate bonds also exhibit seasonality that mirrors that of equities (see Fridson (2000), Chan and Wu (1995), Al-Khazali (2001)). While the government bond market has not been researched as extensively, evidence does exist to indicate that government bond returns also exhibit seasonal behavior which, however, is distinctly different from the seasonal behavior of stocks and high risk corporate bonds (see Ogden (2003), Athanassakos and

1 See, for example, Luciw (2005), DeCloet (2005) and Tait (2005).
2 See, for example, Santoli (1999).

Tian (1997), Chan and Wu (1995)). Returns of stocks and high risk bonds tend to be strong at the beginning of the year, while government bond returns tend to exhibit strength towards year end (see Ogden (2003), Athanassakos and Tian (1997)).

If markets are efficient such patterns in return behavior should not persist. Yet evidence shows they do. While many explanations have been proposed for the seasonal behavior of stocks and bonds, a universally accepted and unified theory on why it occurs and with such regularity is yet to emerge. Tinic, Barone-Adisi and West (1987) provide evidence in support of tax-loss selling as the driving force behind the so called "January Effect". Athanassakos and Schnabel (1994), using Canadian data, and Ackert and Athanassakos (2001) and Cuny et al. (1996), using US data, demonstrate that portfolio rebalancing by professional portfolio managers drives the seasonal behavior of stocks. Ogden (2003) links the seasonality of stocks and bonds to economic activity and to the annual cycle view of the economy. Athanassakos and Tian (1997) link the seasonality in the government of Canada bond market to the annual Canada Savings Bond campaign, a uniquely Canadian phenomenon. Bouman and Jacobsen (2002) find support for the saying "Sell in May and Go Away" in equity markets around the globe, but they conclude that this finding, and why it occurs, remains a puzzle as a number of possible explanations they investigate, such as data mining and risk explanations, among others, are rejected. While some studies, notably of Ogden (2003), have discussed the opposite seasonal pattern in the returns of stocks and high risk bonds vs. government bonds and linked it to economic activity, no attempt has been made to link this seasonal behavior of stocks/high risk bonds and government bonds to a unified underlying driving force that, as it will be explained later, is related to the investment decision process of professional portfolio managers who invest in these securities.

This paper argues that portfolio rebalancing and gamesmanship by portfolio managers (see Haugen (1990), Haugen and Lakonishok (1988)) drive the seasonal behavior of stocks and risk-free bonds and it is this behavior that contributes to the opposite seasonal pattern of the returns of these securities in the financial markets.

To understand the gamesmanship argument, one needs to understand the investment decision process. Greenwald et al. (2001, p. 21) describe it best when they say: "Even though most investment dollars are in the hands of institutions, institutions do not make investment decisions; individuals working for institutions do. These people have their own interest and agendas, some of which may not be in line with the interest of the institution for which they work. They also have their own psychologies, over which they may have little control. On the other hand, institutions normally have investment policies that are mandated by authority, which are intended to constrain the decisions of current investment managers".

Recent research trying to explain the seasonal pattern of stock returns along these lines has tended to emphasize human psychology and the impact weather variables have on investor behavior rather than the principle-agent problems arising from delegated portfolio management. These studies tend to argue that the weather influences the mood and risk taking behavior of investors, which in turn influences stock returns. Hirshleifer and Shumway (2003) hypothesize that cloudy skies lead to investor pessimism and lower returns. This argument, however, does not seem to hold much water as although the weather tends to be better during the summer months, we find lower returns during the summer. On the other hand, Kamstra, Kramer and Levi (2003) argue that bad weather is associated with more risk-aversion. There is less risk aversion in the summer, as the weather is better, and that is why we document lower returns in the summer months. Similarly, Cao and Wei (2004) link stock returns to temperature variations. The last two papers are more intuitively appealing, and can be consistent with the opposite seasonality documented between risky (generally smaller and obscure) stocks and government bonds. However, the weakest months for stock returns are September and October and the strongest months for government bond returns are October and November, which are definitely outside the summer months. In addition, as it will be shown later, the government of Canada bond return seasonality is driven by the second sub-period of our study, when the government of Canada bond market became liquid. As the weather seasonality was the same over our two sub-periods, differential government bond return seasonality can not be explained by the weather. Finally, in relation to the last two papers, Jacobsen and Marquering (2004) conclude that, "without any further evidence, the correlation between weather variables and stock returns might be spurious and the conclusion that weather affects stock returns through mood changes of investors is premature".

In this paper, we concentrate on the other characteristic of individuals working for institutions, described above by Greenwald et al. (2001), namely, that these individuals have their own agendas which may not be in line with those of the institutions they work for.[3] Such principle-agent relationship induces portfolio managers to act on their own behalf, trying to maximize their own wealth, as opposed to that of their clients.

As Greenwald et al. (2001) explain, portfolio managers exhibit herd mentality. They are safe when their portfolios look pretty much like everyone else's who invests with the same mandate, as no one loses his/her job because of average performance or holding the same securities as the rest of the peer group. Herding becomes more pronounced towards the end of the year when portfolio managers window dress to spruce up their portfolios by selling stocks that are obscure and have fallen in price and buying up stocks (and other securities, such as government bonds) that have done well and are visible and in the public eye. At the same time portfolio managers lock in good performance by selling risky stocks (whom they bought at the beginning of the year) and moving to lower risk stocks or risk free securities to affect their Christmas bonus.[4] Window dressing and remuneration-motivated portfolio rebalancing, exacerbated by herding, affects prices and returns of financial securities throughout the year in a predictable way. Risky stocks and high risk bonds are bid up (down) at the beginning of the year (towards year-end), whereas low risk stocks and risk-free bonds are bid up (down) towards year end

3 It is reasonable to assume that portfolio managers, being professionals, are more disciplined and able to resist irrationalities and human psychology biases better than individual investors. However, they do have an incentive to follow self benefiting behavior.

4 This is consistent with comments made to the media by market professionals, as the quote that follows indicates. "Going into year-end what you're going to have is some of the portfolio managers locking in some of their nice gains and not putting them at risk four weeks from year end" (Heinzl (2005)).

(beginning of the year).[5] The pattern repeats annually mimicking window dressing and/or the annual performance evaluation cycle of portfolio managers.

Such seasonal behaviour is difficult for the markets to fully eliminate for two reasons. First, it is related to window dressing or remuneration-motivated turn-of-the-year portfolio rebalancing by professional portfolio managers who pursue their own interest year in and year out. Second, seasonality is not consistently observed every year. Unless we have a unified theory to help us anticipate seasonal behaviour on a consistent basis, market participants can not fully arbitrage the seasonal behaviour of financial securities. This is particularly true since professional portfolio managers' survival is based on short term performance metrics (see Brandes (2004, pp. 40 and 42)).

In this paper, for the period 1957-2003 and sub-periods, we examine whether seasonality is present (and persistent) in the raw and excess returns not only of risky securities, but also of risk free securities by looking at a number of Canadian stock and government bond/bill indices that are highly used in academic and practitioner-based research. The seasonality in Canadian stock and government bond fund flows will also be examined as it is complementary to the examination of the seasonal behaviour of security returns. Moreover, the validity of popular expressions, such as "Sell in May and Go Away" and "As January Goes, so Goes the Year", is also examined. We use such tests as the

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5 Baker and Wurgler (2005) find that government bonds commove strongly with "bond-like" stocks. These are large stocks, long listed stocks and stocks of profitable and dividend paying stocks. This finding is consistent with the argument made in this paper that such "bond-like" stocks and risk-free bonds should exhibit similar seasonality which is driven by the trading behavior of professional portfolio managers whose trades are motivated by self interest.

foundation to support gamesmanship by portfolio managers as the determining factor that drives security return seasonality.

This paper provides evidence in support of the gamesmanship hypothesis. Seasonal strength is observed in the returns of equities, especially smaller stocks at the beginning of the year, with the rest of the year, especially the second half of the year, showing widespread weakness in relation to January. The opposite is true for the returns of government of Canada bonds, as the gamesmanship hypothesis would predict. This finding is consistent with other Canadian (see Athanassakos and Schnabel (1994)) and US (see Cuny et al. (1996) and Ackert and Athanassakos (2001)) studies, which used different data bases and methodology to test for the gamesmanship hypothesis. The above studies carried out direct tests of the gamesmanship hypothesis, as they used mutual fund and/or pension fund data in their tests, but they only examined stock return seasonality in relation to the gamesmanship hypothesis. However, as explained earlier, gamesmanship by portfolio managers has implications for both stocks and government bonds. For a convincing case to be made in favor of portfolio rebalancing and the gamesmanship hypothesis, one has to examine not only the behavior of stocks, but also that of government bonds, and both returns as well as fund flows. This study offers a more complete test of the gamesmanship hypothesis, as it examines the behavior of the returns of both stocks and government of Canada bonds, as well as covers the investments in stocks and government bonds of a wider spectrum of institutional investors (i.e., trusteed pension plans, mutual funds, investment dealers, insurance companies and public financial institutions) whose trading affects security prices and returns. Not only does this study examine the seasonal behavior of security returns (i.e., an indirect test of gamesmanship hypothesis), but data are also provided that enable us to observe directly the trading behavior of institutional investors, thus complementing the indirect tests of the gamesmanship hypothesis. We find that the stock and government of Canada bond flow of funds data employed for the direct tests of the gamesmanship hypothesis exhibit seasonality which mirrors the seasonality in the returns of stocks and government bonds, thus substantiating and consolidating the support for the gamesmanship hypothesis.

In addition, this paper provides support for the expression “Sell in May and Go Away”, as the average performance of risky securities is higher in the November to April period than the May to October period. The opposite is true for risk-free securities. There is also support for the motto “As January Goes, so Goes the Year” and the predictive power of the January returns. Both of these findings are consistent with the gamesmanship hypothesis.

Finally, the paper provides evidence that had investors invested consistently in risky securities in November to April for the last 47 years and rebalanced their portfolios out of risky securities and into government bonds or T-bills for the remaining annual period, they would have outperformed the market by a significant margin.

The paper’s findings will be useful to institutional investors since portfolio managers' bonus and quite often survival are tied to their short-term performance vs. their peers who invest with the same mandate (see Brandes (2004, pp. 40 and 42)). The cyclical nature of the securities industry and the high turnover in this industry reinforce such short-term performance evaluation measures (see Athanassakos (2002) and Leitch (2005)). Information, such as the one that is sought after in this paper, will help portfolio managers do better than average throughout the year. It can also be quite useful to individual investors, as well. This is of particular importance in light of fundamental changes that are taking place in the retirement planning industry. Corporate pension funds that were traditionally structured as defined benefits plans are rapidly changing their structure to defined contributions plans, requiring plan contributors to take personal responsibility for their own financial well being in retirement. Understanding the seasonal behavior of financial markets and the inefficiencies bestowed upon them by institutional factors will help investors secure higher returns and better retirement.

Moreover, this paper's investigation (and support) of the gamesmanship hypothesis will contribute to the discussion on the drivers of the so called value premium, and the reasons that value stocks beat growth stocks. According to one school of thought, the proponents of efficient markets, the value premium exists because value strategies bear more risk (see Fama and French (1992, 1993, 1996, 1998)). Others, belonging to another school of thought, advocate that systematic errors made by investors, consistent with the findings of behavioral researchers, and agency problems faced by professional portfolio managers, consistent with agency theory, prevent the value premium from disappearing (see La Porta, Lakonishok, Shleifer and Vishny (1997), Chan and Lakonishok (2004)). This paper's findings shed further light to these discussions as the paper's thesis and findings are along the lines of the latter argument, particularly as it relates to the agency-driven behavior of professional portfolio managers.

The rest of the paper is organized as follows: Section II develops the indirect tests of the gamesmanship hypothesis by examining the seasonal behavior of security returns in Canada; it discusses the testable hypotheses, data and methodology followed and presents the empirical results. Section III develops the direct tests of the gamesmanship hypothesis by examining the seasonal behavior of the fund flows in stocks and government of Canada bonds; it discusses the flow of funds data and testable hypothesis and reports the empirical results. Finally, Section IV concludes the paper and interprets the findings.

II. Indirect Tests: Seasonality in (Excess) Returns of Financial Securities

In this section, we will examine the seasonal behavior of security returns, which has been impacted by the trading of institutional investors, in order to provide indirect support for the gamesmanship hypothesis.

II.1. Testable Hypotheses

Prior research has documented seasonality in the returns of small stocks and high risk bonds. Keim (1983) finds that about half of the annual excess return of small firms occurs in the first few months of the year. This evidence is corroborated by Blume and

Stambaugh (1983) and Haugen and Lakonishok (1988), among others. Fridson (2000) finds evidence consistent with seasonality in high risk bonds that mimics the seasonality in stocks and argues that whatever drives the seasonality of stocks also drives the seasonality of high risk bonds. Seasonality in high risk securities is consistent with both the gamesmanship hypothesis and tax loss selling. Tax loss selling, however, can not explain the seasonality in government bond returns that is opposite to that experienced by high risk securities (see Athanassakos and Tian (1997)).

In this paper, we argue that if the gamesmanship hypothesis is correct, we should observe seasonality in the (excess) returns not only of risky securities (especially smaller stocks), but also in the (excess returns) of well known, large, low risk stocks and risk-free securities.[6] According to the gamesmanship hypothesis, the high returns on risky securities (particularly smaller companies) in the first few months of the year are caused by systematic shifts in the portfolio holdings of professional portfolio managers who "window dress" or lock in returns to affect performance-based remuneration. Institutional investors are net buyers of risky securities in the early months of the year when they are less concerned about including well-known, low risk or risk-free securities in their portfolios or they are trying to outperform benchmarks. Towards the later months of the year, portfolio managers divest from lesser-known, risky, or poorly performing stocks and replace them with well known and less risky (generally larger) stocks with solid recent performance or risk-free securities, such as government bonds. The excess demand

6 Our data (see Section II.2) do not allow us to directly examine the issue related to well known, large and safer stocks in detail. Given the data limitations, the value weighted index (proxy for large stocks) may be used as an imperfect proxy to examine this issue. However, Ackert and Athanassakos (2001) do find that their US sample of large, well followed and "bond-like" stocks exhibits opposite seasonality from that shown by small and less followed stocks.

for risky securities early in the year bids the prices of these securities up. The opposite happens towards the last few months of the year. Government bonds and safer, larger, well known stocks are bid up, whereas risky, smaller, obscure, less known stocks (and high risk corporate bonds) are bid down. As a result, we would expect to find seasonality not only in risky securities, but also in low risk (the "bond-like" stocks as per footnote #5)) and risk-free securities, as portfolio managers rebalance their portfolios throughout the year. If tax loss selling causes seasonal behaviour in financial markets, we will not expect to find seasonality in government bonds, and in the returns of low risk, large, safe stocks. This is because tax loss selling is generally associated more with the behaviour of individual investors who tend to hold smaller cap stocks (see Ritter (1988)). At the same time, institutional investors tend to concentrate more on larger, safer and better known stocks, and risk-free bonds (see Blume and Friend (1986)). Thus, the stock of large, well known and low risk firms, as well as government bonds should not be subject to any buying or selling pressure for the purpose of tax-loss selling.

Our research hypothesis is thus:

H_0: There is no monthly seasonal pattern in the (excess) returns of financial securities, namely, small stocks, and large, well known, safe stocks and risk-free bonds.

If portfolio managers invest to outperform benchmark portfolios, they will put their money in risky securities at the beginning of the year and away from risky securities towards year end. As a result, for risky securities, January (or the first few months of the year) (excess) returns can be expected to be quite high. In such cases, the second half of the year should be weak in relation to January, as managers would bail out of those securities in order to lock in profits. As they disinvest from those securities, managers would tend to move to less risky or risk-free securities pushing up those less risky securities' prices. As a result, those large, low risk companies' securities and risk-free securities are expected to experience weakness in January (or the first few months of the year) and strength towards the second half of the year in relation to January, as the gamesmanship hypothesis would predict, and, hence, we would expect to reject H_0.

However, portfolio managers would not invest in risky securities indiscriminately, irrespective of whether the year was (or was expected to be) a bull or bear market and irrespective of whether the year was (or was expected to be) a recovery year or a recessionary year. Based on Athanassakos (1995), portfolio managers would invest in risky securities when the year ahead was expected to be a good one and withhold their investment from such securities if the year ahead was forecast to be adverse. Athanassakos (1995) demonstrates that the strength in risky securities at the beginning of the year is not a sure thing, but it largely depends on what institutional investors think of the year ahead. This is also consistent with the popular motto "As January Goes, so Goes the Year". If institutional investors are, on average, right when they expect a recession or a bear market in the year ahead, and they divest from risky securities in such cases at the beginning of the year when portfolios are rebalanced, it is only natural to also expect risky securities to experience weakness in January and in the months of the year that follow and, as a result, for the year as a whole.[7] This should not be the case for risk free securities for obvious reasons.

Consequently, if we control for recessions or bear markets, we may be able to get a better idea of the contribution of institutional investors to the seasonal behaviour of financial securities and whether these investors' trading behaviour throughout the year and in good or bad years affects security returns.

As a result, the following subsidiary hypothesis will also be tested to examine the effect of recessions and/or bear markets on security returns seasonality, particularly with regards to the strength in January, to further investigate the gamesmanship hypothesis, especially as it relates to the motto "As January Goes, so Goes the Year".

H_0^1: There is a monthly seasonal pattern in the (excess) returns of financial securities (small stocks, and large, well known, safe stocks and risk-free bonds) in January during recessions or bear markets.

If risky security seasonality is driven by portfolio managers, we should not expect a seasonal strength in the excess returns of risky stocks in January if a recession or a bear market occurs (or is expected to occur) in the year ahead and reject the above hypothesis, as it relates to risky stocks. However, if portfolio managers are rebalancing into

[7] Athanassakos (1995) constructs an economic indicator, consisting of variables that could proxy for indicators institutional investors would consider before making investments, such as the yield curve, risk premium, real corporate profits and expectations about inflation and corporate profits from economic consensus forecasts, and tries to determine whether this indicator could anticipate stock market performance over the following year, as well as, implicitly, professional portfolio manager behavior. While we could have used such model to anticipate economic performance and institutional investor attitude with regards to investing in financial securities, we chose to use actual recession/bear market timing (see Section II.2 and footnote #10), assuming that professional portfolio managers are, on average, right about a recession/bear market.

government bonds during recessions or bear markets, we should observe strength in government bond returns during such periods and, as a result, we will be unable to reject H_0^1, as it relates to government bonds.

A popular expression in the financial markets, in relation to equity investments, is "Sell in May and Go Away”. It is possible that the strength in stock returns in January is actually spread over a few months around this month as it is not unexpected that some arbitraging will be taking place by those investors not bound by the restrictions or conflicts portfolio managers are facing. Moreover, gamesmanship may not take place all at once in January but spread around the month of January and portfolio rebalancing may not happen all at once in the first month of the year, but also spread around it, namely, in the first and last few months of the year. Such portfolio rebalancing should not only impact risky stocks, but also government bonds consistent with the gamesmanship hypothesis. As a result, we should expect seasonal strength (weakness) in more than the month of January, namely from November until April for risky (risk-free) securities and reversal from May to October.[8]

Consequently, two more subsidiary hypotheses will be tested along these lines to test the validity of the expression “Sell in May and Go Away”. They are the following:

[8] On the question of why we chose November to April and May to October, we refer to Bouman and Jacobsen (2002) who state “While we lack a formal theory, we do at least have an old market saying to go by. In other words, we have not tried all half-year periods and have only reported the results of the best period we find”.

H_0^2: There is no semi-annual seasonal pattern in the (excess) returns of financial securities, namely, small stocks, and large, well known, safe stocks and risk-free bonds.

H_0^3: There is semi-annual seasonal pattern in the (excess) returns of financial securities (small stocks, and large, well known, safe stocks and risk-free bonds) in November-April during recessions or bear markets.

Based on the above discussion, we should expect to reject both hypotheses.

II.2. Data

Data from January 1957 to December 2003 are obtained from the Canadian Financial Markets Research Centre (CFMRC) data base.[9] This data base includes, among other data, stock index (universe equally weighted and value weighted) total return data, as well as rates of returns on indices of long-term government of Canada bonds (over 10 years) and 91-day Treasury bills.

The CFMRC equal weighted index return is the average monthly total return for all domestic common equities in the CFMRC database. It is used in this study as a proxy for smaller, higher risk stocks. The CFMRC value weighted index return is the market value weighted average monthly total return for all domestic common equities in the CFMRC

9 The CFMRC database starts in January 1957.

database. This index is used in this study as a rough proxy for larger, well known, lower risk stocks.

The 91-day T-bill return is defined as the return on a 91 day T-bill purchased at the end of last month and sold at the end of the current month. Long-term government of Canada (GOC) bond return is defined as the return on a long term GOC bond with an approximate term to maturity of 17 years purchased at the end of last month and sold at the end of the current month. More on the descriptions of these series and their construction can be found in Hatch and White (1988).

The timing of recessions and bear markets has been obtained from www.thedowtheory.com/bear&recessions.htm.[10]

II.3. Methodology

To test for seasonality in the returns of Canadian financial securities in relation to our H_0 hypothesis, the following time-series dummy OLS regressions are run.

$$R_{qt} = \sum_{j=1}^{12} a_j D_{qt}^{j} + e_{qt} \qquad (1)$$

[10] The timing of recessions from this database is consistent with NBER's business cycle dates. However, this database also makes available dates for bull and bear markets. The US and Canadian business cycle dates are mostly identical, but we prefer to use the US business cycle dates as more effort and resources go into the timing of US business cycle dates and it is the US economy that most Canadian economists tend to focus on as the driver of the Canadian business cycles.

where, R_{qt} is the total monthly raw return of the CFMRC value weighted total return index or the equally weighted total return index or the government of Canada bond index, or the T-bill index in month t, or excess return thereof. D^j_{qt} is a dummy variable that is equal to 1 if the current month is month j and equal to zero otherwise. This model tests whether stock or government bond/bill raw returns (or excess returns) in a given month (j=1 to 12) are statistically different from zero. Coefficient a_1 indicates the average raw return of stocks or government bonds/bills (or the average excess return) in our sample for the month of January. The rest of the coefficients (a_2 to a_{12}) represent the average returns (or excess returns) from February to December.

To test for security return seasonality in relation to our H_0^1 hypothesis, the following time-series dummy OLS regressions with an interaction term are run in order to additionally capture seasonal effects, if any, during recessions or bear markets, namely the joint effect of the impact of recessions or bear markets on stock and government bond/bill raw returns (or excess returns) in January.

$$R_{qt} = \sum_{j=1}^{12} a^*{}_j D^j_{qt} + b_1{}^* X_{qt} JAN_{qt} + \varepsilon_{qt} \qquad (2)$$

The coefficients of such a regression represent the average return (or excess return) for each month of the year. Not only does this regression differentiate each month from each other, but also captures the effect of recessions or bear markets on raw or excess returns in the month of January. Independent variable X_{qt} stands for a dummy variable that takes on the value of 1 for the recession or bear market months of the year. Variable "JAN" is a binary dummy variable for the month of January. As a result, the security return seasonality in the month of January during recessions or bear markets will be measured by (a_1* + b_1*). The rest of the coefficients (a_2* to a_{12}*) represent the average returns (or excess returns) from February to December, exactly as in regression (1).

Finally, to test hypotheses H_0^2 and H_0^3, regressions (1) and (2) above are run with only two semi-annual periods, November-April and May-October. The November-April period average return (or excess return) is captured by coefficient a_1 (i.e., the coefficient for dummy variable for November-April) and the May-October period average return (or excess return) by coefficient a_2 (i.e., the coefficient for dummy variable for May-October). As earlier, X_{qt} in regression (2) stands for a dummy variable for recession or bear market months of the year, as applied to the semi-annual seasonality tests.[11] Variable "JAN" in this case is a binary dummy variable for the period November to April. Similarly, the security return seasonality in the period November to April during recessions or bear markets will be measured by (a_1* + b_1*).

11 For recession or bear market months to be considered, the recession/bear market had to cover a period of at least 8 months. This ensured that the recession/bear market had considerable length to affect professional portfolio manager behavior and lasted for a period close to a year, which, except for one case, included the month of January and made sure that the whole November-April period or a large part thereof was in a recession or bear market, when a recession/bear market was flagged.

II.4. Empirical Results on the Seasonality of (Excess) Returns of Financial Securities

II.4.1. Summary Statistics

Table 1 reports the summary statistics of monthly returns of the equally and value weighted stock indices, and the government of Canada bond and T-bill indices, as well as differences between these indices' returns for the whole sample period and sub-periods. It is interesting to note that while stock returns have declined on average in the 1981-2003 sub-period from the one before (1957-1980), the opposite is the case for government bonds. Government bond returns in the second sub-period have significantly exceeded those of the first sub-period. In fact, in the 1981-2003 sub-period, government bond returns exceeded the returns of the value weighted index and almost matched the returns of the equally weighted index.

II.4.2. Monthly Stock and Government Bond Return Seasonality

Tables 2 and 3 report the results from regression (1), respectively, for raw index returns and differences between index returns over 1957-2003 and sub-periods. The results provide support for H_0. In Table 2, we see that both value and equally weighted indices show high average returns in the month of January and low returns thereafter, particularly for the equally weighted index and in the May to October period.[12] Both sub-periods exhibit similar behaviour, although the strength of January has weakened for both indices in the second sub-period, but more so for the value weighted index. The government of Canada bond returns exhibit statistically significant returns only in the August to December period. While the strength in the equally weighted stock index returns is consistent throughout our sample, the value weighted stock index seasonality is driven by the first sub-period and the government of Canada bond index seasonal strength is primarily driven by the second sub-period of our sample. In Table 3, we observe the superior performance of the equally weighted index (smaller stock) returns vs. the value weighted index (larger stock) returns and the government of Canada bond index returns at the beginning of the year and particularly in January. While stocks seem to do better in January and at the beginning of the year, the government of Canada bond index is outperforming both stock indices in October and the value weighted index both in October and November. This behaviour is particularly robust in the second sub-period of our sample. The value weighted index significantly out-performs the equally weighted index in the month of October (be it at 10% level) in the second sub-period of our sample (see Table 3, Panel C), which is also consistent with the documented strength in the September-October returns of the government of Canada bond index in the second sub-

[12] November and December returns tend to also be significantly positive for the stock indices employed in this paper, especially for the equally weighted index. It is quite possible that some arbitrage is taking place by those investors not bound by the constraints or conflicts portfolios managers face. In addition, it is possible that some risk taking behavior is followed by "desperate", so to speak, portfolio managers who have lagged their benchmarks and are trying to catch up by investing in extremely risky stocks. This behavior is not unlike the behavior of corporate finance managers who in cases of extreme financial distress are willing to forgo positive NPV projects in favor of negative NPV projects as long as these projects have extremely high risk hoping to hit the "jackpot" and escape the predicament their company and themselves are in and in so doing "go for broke", to use a gambling language (see Brealey, Myers and Allen (2006, p. 483).

period of our sample.[13] Figures 1 to 10 depict diagrammatically the results from regression (1), namely, the average returns per month of the raw index returns and the differences between the indices used in this study. The clear seasonal strength of the equally weighted index (smaller stocks) at the beginning of the year is evident, as well as the seasonal strength of the government bond returns in the second half of the year and the inverse seasonality between stock and government of Canada bond returns, especially in the second sub-period of our sample.

To obtain a better picture of the seasonality of the financial securities examined in this paper and the statistical significance of the difference in returns between January and the rest of the months of the year, regression (1) is run in the following transformation:

$$R_{qt} = a_0 + \sum_{j=2}^{12} a_j D^j_{qt} + e_{qt} \qquad (1)'$$

where, R_{qt} and D^j_{qt} are defined as in regression (1) earlier. This model identifies the months in which stock and government bond/bill returns (or excess returns) are unusually high. It tests whether stock or government of Canada bond/bill returns (or excess returns) in a given month (j=2 to 12) are different from a base month, in this study January. The intercept a_0 indicates the average raw return of stocks or government of Canada bonds/bills (or the average excess return) in our sample for the month of January. The

[13] As indicated earlier (see footnote #6), the value weighted index is only an imperfect proxy of well known, less risky, large stocks and, as a result, one should only expect moderately strong results in this regard.

rest of the coefficients represent the difference in mean returns (or excess returns) between January and each of the other months.

Tables 4 and 5 report the results from regression (1)'. This regression looks not only at the January raw returns and differences between the various index returns over 1957-2003 and sub-periods, but also at the difference in returns (and excess returns) between January and the rest of the months of the year. The results provide further support for H_0. In Table 4, we see that both value and equally weighted indices show strength in the month of January and weakness vis-à-vis January thereafter, particularly for the equally weighted index and in the second half of the year. This is true in both sub-periods. The government of Canada bond returns exhibit no strength in January, and only returns in October (at 5% level of significance) and November (at 10% level of significance) are statistically higher than January. While the seasonality in the equally weighted stock index returns is consistent throughout our sample, the value weighted stock index return seasonality is driven by the first sub-period and the government of Canada bond index return seasonal strength is driven primarily by the second sub-period of our sample. In Table 5, we observe a strong seasonal behaviour in the difference in returns between the equally weighted index (smaller stock) returns and the value weighted index (larger stock) returns and between the equally weighted (or value weighted) index returns and the government of Canada bond (or T-bill) returns. While stocks seem to do better in January and at the beginning of the year, government of Canada bonds and T-bills are outperforming both stock indices in September and October. This behaviour is consistent in both sub-periods. It is, however, particularly robust in the second sub-period of our sample. Moreover, as earlier, our imperfect proxy for low risk, safe, larger stocks (i.e., the value weighted index) shows better (statistically significant) performance in October than the equally weighted index (see Table 5, EW-VW). As before, the October performance is driven by the second sub-period. In the first sub-period, the value weighted index outperforms the equally weighted index in November.

II.4.3. Sell in May and Go Away: Semi-Annual Stock and Government Bond Return Seasonality

As documented in Tables 2 and 3 and explained in footnote #12, November and December returns tend to also be significantly positive for the stock indices employed in this paper, especially for the equally weighted index. It is quite possible that some arbitrage is taking place by those investors not bound by the constraints or conflicts portfolios managers face. In addition, it is possible that some risk taking behavior is followed by "desperate", so to speak, portfolio managers who have lagged their benchmarks and are trying to catch up by investing in extremely risky stocks. As a result, months are now grouped into two semi-annual periods based on the popular saying "Sell in May and Go Away", namely November-April and May to October. Tables 6 and 7 report the results from running regression (1), as applied to the semi-annual rather than the monthly seasonality tests. They pertain to tests of semi-annual seasonality in returns of financial securities and hypothesis H_0^2. From Table 6, there is unequivocal evidence that there is a strong November-April semi-annual seasonal pattern in stock returns.[14, 15] In fact, on average, the annual return of the stock indices examined in this paper is all realized in November-April, as the average return for May-October is not different from zero. In terms of the government of Canada bond returns, there is a strong semi-annual seasonality in the second half of the annual period (i.e., May-October), which nevertheless is primarily driven by the 1981-2003 sub-period. Changes that took place in the late 70's and early 80's in the contact of monetary policy by the US Fed and the Bank of Canada and, especially, a dramatic increase in the liquidity of the Canadian government bond market helped induce a more severe portfolio rebalancing in and out of government securities by institutional investors in the 1981-2003 sub-period.[16]

Table 7 shows semi-annual seasonality in return differences between the securities in question. The inverse semi-annual seasonality between stocks and government of Canada bonds is quite apparent. Stock indices tend to outperform the government of Canada bond index in the November-April period and under-perform it in the May to October period. This pattern is particularly true in the second sub-period. The equally weighted index, on

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[14] This finding is consistent with Bouman and Jacobsen (2002). They examine a number of possible explanations for this finding, such as data mining, the January Effect, risk explanations, shifts in interest rates, sector specific factors, which they all reject. Particularly with regards to the usual criticism of such studies, that of data mining, they state "While we lack a formal theory, we do at least have an old market saying to go by. In other words, we have not tried all half-year periods and have only reported the results of the best period we find". They conclude by saying "It seems that we have not yet solved this new puzzle".

[15] The equally weighted total return index experienced a positive return in the November-April period in 39 out of the 47 years of our sample and a negative return only in 8 years. Out of the 8 negative return years, 6 years, namely, 1960, 1970, 1973, 1974, 1982 and 1990, were recession years.

[16] In the late 70's, the Canadian government started to incur large budgetary deficits which resulted in the issuance of a large amount of government of Canada bonds to finance the deficit. This was unlike earlier periods. The increased issuance of government of Canada bonds added to the liquidity of the Canadian government bond market starting in the late 70's. In fact, prior to the late 70's, the Canadian government bond market was so thin that market participants were benchmarking all bonds off a corporate bond, namely the Bell Canada Enterprises bond, which had much higher liquidity than corresponding government of Canada bonds. As a result, there would have been little scope for portfolio rebalancing by professional portfolio managers using government of Canada bonds in the 1957-1980 sub-period of our study. We would like to thank Mr. Rajiv Silgardo of Barclays Global Investors for bringing this to our attention.

the other hand, tends to outperform the value weighted index in the November-April period, in both sub-periods. This out-performance is also observed in the May-October period, but only in the first sub-period.[17] It seems that the prediction of portfolio rebalancing and gamesmanship works more consistently in 1981-2003 than in the earlier sub-period. This is quite interesting as in the 1981-2003 sub-period, the derivatives markets were more prevalent and better developed. While portfolio managers could have used such markets to affect some of their objectives to a greater extent in 1981-2003 than in the earlier sub-period, it seems they did not. In fact, their behaviour intensified more in the latter sub-period than in the former one.

Finally, Figures 11-20 plot the results from Tables 6 and 7. The patterns speak for themselves. November to April tends to be a strong semi-annual period for stock returns, whereas May to October tends to be a strong semi-annual period for government of Canada bond returns. Hence, we reject H_0^2.

These findings have important implications for investors. Had investors invested consistently in risky securities (i.e., gone long in the equally weighted stock index, or an equivalent exchange traded fund (ETF)) and shorted the government of Canada bond index (or an equivalent ETF) in November to April for the last 47 years and rebalanced their portfolios out of risky securities and into government bonds for the remaining annual period (i.e., shorted (smaller) stocks and gone long in government of Canada

[17] Regression (1)', as applied to the semi-annual tests, was also run in this case, as well. In the case of the stock indices, for both sub-periods, November-April returns are statistically higher than May-October returns at traditional levels of significance. The same holds for the difference in returns between the stock indices and risk-free securities. As in the reported results, the government of Canada bond return seasonality is driven by the second sub-period. Detailed results from running this regression are not reported in the paper, but are available from the author upon request.

bonds), they would have produced an average annual rate of return of about 15% (see Table 7, Panel A). The corresponding performance for the 1981-2003 sub-period would have been about 20% (see Table 7, Panel C). The average annual rate of return over the last 47 years (1981-2003) would have been 20% (24%) had investors gone long in the equally weighted index in November-April and gotten out of risky securities altogether in the May-October semi-annual period and, over that period, invested instead heavily (and exclusively) in government of Canada bonds (see Table 6, Panels A and C, respectively).[18]

The findings have also implications for ongoing research on the drivers of the return seasonality in financial securities. The seasonality in government bond returns evident in this, as well as in the previous section is not consistent with tax-loss selling. Moreover, lack of seasonality in government bond returns in 1957-1980, when there was strong seasonality in 1981-2003, seems to also be inconsistent with the weather related explanation of seasonality in financial securities.

II.4.4. As January Goes so Goes the Year: Stock and Government Bond Returns in January vs. the Rest of the Year

Another popular expression in the markets is "As January Goes, so Goes the Year". It is related primarily to equity returns and implies that the January Effect has a predictive power when it comes to the performance of the stock market. But based on the

[18] Not only does this strategy generate a higher return than the market portfolio, but it also encompasses lower risk. In addition, this is a low transaction costs strategy as it requires entry into and exit out of the market only twice a year.

gamesmanship hypothesis, it can also have implications for government bond returns. Is there any truth to such expression? Tables 8 and 9 report the results from running regression (2). They purport to provide evidence in support (or not) of hypothesis H_0^1 and the effect of recessions on January security returns and stock and government bond return seasonality. From Table 8, it is evident that the January seasonal tends to completely disappear (and in fact be reversed) for the value weighted index, and considerably weaken for the equally weighted index, especially in the second sub-period during recessions. At the same time, the government of Canada bond returns strengthen in January during recessions, as we would expect. Table 9 presents an even clearer picture of the disappearing January strength in the equally and value weighted index returns vis-à-vis government securities during recessions. Most interestingly, the difference in returns between the value-weighted index and the government of Canada bond index or T-bill index considerably weakened in January in the first sub-period and strongly reversed sign in the second sub-period. The results from running regression (2) and testing H_0^1 with regards to the effect of bear markets on January financial security return seasonality are similar to those obtained when we control for recessions and, hence, they are not reported here (but are available upon request). The findings in this section provide sufficient evidence to reject (accept) H_0^1, as it relates to stock (government bond) returns. Professional portfolio managers seem to do a fairly good job in anticipating recessions and/or bear markets and in these periods they tend to withhold a lot of their investments in equities and favour investments in risk-free securities. Such behaviour affects adversely (favourably) the returns of risky (risk-free) securities at the beginning of the year when a recession or a bear market is expected.

Tables 10 and 11 report the results from running regression (2), as applied to the semi-annual rather than the monthly seasonality tests. They pertain to tests of semi-annual seasonality in returns of financial securities in relation to recessions, and, hence, to tests of hypothesis H_0^3. Similar to the evidence provided in Tables 8 and 9, the semi-annual seasonality of the stock indices mostly disappears, or considerably weakens and even reverses sign in some cases, when we control for recessions in the November-April period. On the other hand, as we would expect, the returns of the government of Canada bond index tend to strengthen in the November-April period during recessions. The results from running regression (2) and testing H_0^3 with regards to the effect of bear markets on the November-April period financial security return seasonality are similar to those obtained when we control for recessions and, hence, they are not reported here (but are available upon request). Consistent with the earlier discussion on H_0^1, these results, too, provide sufficient evidence to reject (accept) H_0^3, as it relates to stock (government bond) returns.

In addition to controlling for recessions and bear markets using regression analysis to examine the motto "As January Goes, so Goes the Year", in order to shed further light to the validity of this motto and at the same time make an inference about the predictive power of January (or the November-April period), we also looked at financial security returns in January (November-April) vs. the rest of the year in years when the equally weighted index declined in January (November-April), as well as when this index rose in

January (November-April) for the 1957-2003 period.[19] The January (November-April) return in a down market is -.0342 (-.0147). For the rest of the year, the mean monthly return is .0043 (.0025).[20] While the mean monthly returns for the rest of the year are positive (the median return for the non-January months is actually negative (see footnote #20)), they are not statistically different from zero. As a result, when the market goes down in January (November-April), the rest of the year goes nowhere and if one includes the strong negative January (November-April) returns in the calculation, the whole year is a down year. For government of Canada bonds, the mean January (November-April) return is .0022 (.0066) in a down market, while for the rest of the year, the mean monthly return is .0132 (.0155). Similar to previous evidence, government bonds show greater strength in the rest of the year as opposed to January or November-April period, even though in down markets government bonds do show positive returns in January, as well as in November-April.[21] What are the findings in an up market (i.e., when the equally weighted index went up) in January or the November-April period? The average January (November-April) return for the equally weighted index is .0767 (.0350) vs. an average monthly return of .0139 (.0043) for the rest of the year.[22] As a result, strong January or November-April period returns beget positive rest of the year returns for the equally

[19] The equally weighted index is chosen here as the seasonality in the returns of this index was considerably weakened during recessions (and bear markets), but not totally eliminated, as was the case for the value weighted index (see Tables 6 and 7 and 10 and 11).

[20] There were 8 negative November-April periods for the equally weighted index. In addition to the mean referred to above the median, max and min returns in May-October (i.e., rest of year) in this case are .0017, .035, and -.034, respectively. There were 10 negative January months for the equally weighted index. In addition to the mean referred to above the median, max and min returns in the rest of year in this case are -.0017, .040, and -.027, respectively.

[21] The mean return differences between January (November-April) and the rest of the year for both stocks and government of Canada bonds in a down market are statistically significant at traditional levels of significance.

[22] There were 39 positive November-April periods for the equally weighted index. In addition to the mean referred to above the median, max and min returns in May-October (i.e., rest of year) in this case are .0076, .068, and -.059, respectively. There were 37 positive January months for the equally weighted index. In addition to the mean referred to above the median, max and min returns in the rest of year in this case are .0098, .058, and -.034, respectively.

weighted index and, naturally, for the year as a whole. Consequently, consistent with earlier evidence from Tables 8-11, there is evidence in support of the popular expression "As January Goes, so Goes the Year". As far as the government of Canada bonds are concerned, the mean January (November-April) return is .0053 (.0056) vs. a mean monthly return of .0050 (.0058) for the rest of the year. From the evidence on government bond returns in an up and down market, it is apparent that government bonds tend to do much better when there is uncertainty and low returns in the stock market as opposed to when stock markets are doing well and there is confidence in stock market performance.[23] Again, this is consistent with rebalancing and active portfolio management by professional portfolio managers.

III. Direct Tests: The Seasonality of the Flow of Funds in Stocks and Government of Canada Bonds

Up to this point, this study has examined the seasonal behaviour of security returns which has been impacted by the trading of institutional investors. This represented an indirect test of the gamesmanship hypothesis. However, if there is a seasonal pattern in institutional investors' portfolio rebalancing (affecting stock and government bond prices and returns), we should be able to observe such trading behaviour directly by examining the flow of funds in stocks and government of Canada bonds throughout the year. This is the question we examine in this section.

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[23] The return difference between January (November-April) and the rest of the year for stocks in an up market is statistically significant at traditional levels of significance. This is not the case for the government of Canada bonds.

III.1. Data

To complement (and substantiate) the indirect tests (evidence) of the gamesmanship hypothesis, we make use of the flow of funds data. These data, which are obtained from CANSIM II Table 3780001 of the CANSIM data base of Statistics Canada, are sectoral financial flow of funds and are available quarterly from 1961:Q1 to 2005:Q3. They are not seasonally adjusted. The flow of funds data are widely disaggregated both by sector in the economy and financial instrument and provide one of the few sources of comprehensive and detailed data on the sources and uses of funds. From this data base, we extract total fund flows in stocks and government of Canada bonds by Trusteed Pension Plans, Mutual Funds, Investment Dealers, Insurance Companies and Public Financial Institutions. Prior to 1980's, the Canadian government bond market was extremely illiquid (see footnote #16). At the same time, prior to the 1980's, the Canadian flow of funds data suffered from many shortcomings, such as weak survey coverage, survey questionnaires which were not sufficiently detailed to meet the requirements of the flow of funds accounts and a lack of adequately documented records (see Athanassakos (1988)). As a result, this study examines the seasonality of stock and government bond flow of funds data over the 1981:Q1-2005:Q3 period, which coincides with the second sub-period of the study.

III.2. Testable Hypothesis

As the flow of funds data are only available quarterly, we can not separately test the January vs. the semi-annual effect. Moreover, there are not enough degrees of freedoms to test for the effect of recessions/bear markets in any reliable way. As a result, the only hypothesis that will be tested with regards to our direct tests of the gamesmanship hypothesis is the following:

H_0^4: There is no seasonal pattern in the flow of funds in stocks and government of Canada bonds.

In this paper, we have found support for monthly and semi-annual seasonality in stock and government bond returns. The frequency of reporting the flow of funds data is quarterly. As the quarterly frequency lies in between the monthly and semi-annual reporting, if monthly and semi-annual seasonality in stock and government bond returns is driven by the behaviour of institutional investors, we should also be able to observe similar seasonality in the quarterly flow of funds in stocks and government of Canada bonds and reject the above hypothesis. This is because the supply of stocks and government bonds is fairly stable in the short-term, and, as a result, any seasonal change in the demand for funds relative to the supply of funds should affect the seasonal behaviour of security prices and returns.

III.3. Empirical Results on the Seasonality of the Flow of Funds in Stocks and Government of Canada Bonds

III.3.1. Summary Statistics

Table 12, Panel A reports the summary statistics for the stock and government of Canada bond quarterly flow of funds data for the period 1981:Q1-2005:Q3, overall and by quarter. For stocks, the strongest quarter of the year is quarter one, while for government of Canada bonds, the strongest quarter of the year is quarter four. This is evident from both the mean and median of the quarterly flow of funds in stocks and government of Canada bonds. Figure 21, which plots mean quarterly fund flows, shows very vividly the opposite pattern of fund flows in stocks and government of Canada bonds throughout the year. It is interesting to note that while the fund flows in stocks in Quarters 2 to 4 are way below those of Quarter 1, there are still positive fund flows into the stock market.[24] As discussed in footnote #12, it is possible that some arbitrage is taking place or some risk taking behaviour is followed by "desperate" institutional investors who have lagged their benchmarks and are trying to catch up by investing heavily in stocks, especially risky ones.

[24] T- and F-statistics show that mean quarterly fund flows in stocks are different from zero and from each other, respectively at traditional levels of significance. Similar statistics for the mean quarterly fund flows in government bonds show that only quarters 2 (at the 10% level) and 4 (at the 1% level) are statistically different from zero, although the mean quarterly fund flows in government bonds are different from each other at traditional levels of significance.

III.3.2. Regression Analysis

To more formally examine the seasonality of the flow of funds in stocks and government of Canada bonds and provide a more robust direct test of portfolio rebalancing to complement the seasonal behaviour of the returns of stocks and government of Canada bonds, we run the following dummy OLS regressions, which are similar to regression (1)'.

$$F_{qt} = a_0 + \sum_{i=1}^{4} a_j D_{qt}^{j} + e_{qt} \qquad (1)''$$

In these regressions, the dependent variable is now the quarterly flow of funds in stocks or government of Canada bonds, while the seasonal dummy variable takes on the value of 1 if current quarter is quarter j and zero otherwise. Similar to the interpretation of regression (1)', this model identifies the quarters in which fund flows in stocks and government bonds are unusually high. It tests whether stock or government bond fund flows in a given quarter (j=2 to 4) are different from a base quarter, in this case quarter 1. The intercept a_0 indicates the average stock or government bond fund flows in the first quarter. The rest of the coefficients represent the average difference in stock or government bond fund flows between quarter 1 and each of the other quarters.

The regression coefficients from running this regression for the stock and government bond fund flows are reported in Table 12, Panel B. Consistent with Table 12, Panel A, the opposite seasonality of fund flows into stocks and government bonds is quite apparent and mirrors that of the stock and government bond return data. Fund flows in the stock market are strong in the first quarter and weaken through out the year. Quarter 3 fund flows in stocks are significantly lower than quarter 1 at the 5% level of significance, while quarter 2 fund flows in stocks are significantly lower only at the 10% level of significance. The opposite is the case for the government of Canada bond fund flows. The strongest quarter of the year for the government of Canada bonds is the fourth quarter with the rest of the quarters being significantly lower than the last quarter. Hence, we reject H_0^4. This section's findings are consistent with the behaviour of stock and government bond returns and provide further support for the gamesmanship hypothesis.[25]

IV. Conclusions and Interpretation of Findings

In this paper, for the period 1957-2003 and sub-periods, we examined whether seasonality was present (and persistent) in the raw and excess returns not only of risky securities, but also of risk free securities by looking at a number of Canadian stock and government bond/bill indices that are highly used in academic and practitioner-based research. The seasonality in Canadian stock and government bond fund flows was also examined as it was complementary to the examination of the seasonal behaviour of security returns. Moreover, the validity of popular expressions, such as "Sell in May and Go Away" and "As January Goes, so Goes the Year", was also examined. We used such

[25] We also ran regressions similar to equation (2) with an interaction term to capture the effect of recessions on the flow of funds in stocks and government bonds in the first quarter. As there were only three first quarter observations for recessions, the coefficients for the interaction term were not statistically significant at traditional levels of significance, even though it had the right sign for stocks, i.e., negative, while it was virtually zero for government of Canada bonds.

tests as the foundation to support gamesmanship by portfolio managers as the determining factor that drives security return seasonality.

This paper's findings provided evidence in support of the gamesmanship hypothesis. Seasonal strength was observed in equities, especially smaller stocks at the beginning of the year, with the rest of the year, especially the second half of the year, showing widespread weakness in relation to January. The opposite was true for government of Canada bonds, as the gamesmanship hypothesis would predict. If portfolio managers invest to outperform benchmark portfolios, they will put their money in risky securities at the beginning of the year. For those securities, January (or beginning of the year) (excess) returns can be quite high. In such cases, the second half of the year is, in general, weak, as managers bail out of those securities in order to lock in profits. As they disinvest from those securities, managers tend to move to less risky and/or risk-free securities pushing up those securities' prices. As a result, those securities tend to have weak January (or beginning of the year) effect but a strong second half of the year, as the gamesmanship hypothesis would predict. The evidence provided in this paper is consistent with other Canadian (see Athanassakos and Schnabel (1994)) and US (see Cuny et al. (1996) and Ackert and Athanassakos (2001)) studies of the gamesmanship hypothesis, which examined only equities and used different data bases and methodology to test for the gamesmanship hypothesis and the January Effect.

This study offered a more complete test of the gamesmanship hypothesis, as it examined the behavior of the returns of both stocks and government of Canada bonds, as well as covered the investments in stocks and government bonds of a wider spectrum of institutional investors (i.e., trusteed pension plans, mutual funds, investment dealers, insurance companies and public financial institutions) whose trading affects security prices and returns. Not only did this study examine the seasonal behavior of security returns (i.e., an indirect test of gamesmanship hypothesis), but data were also provided that enabled us to observe directly the trading behavior of institutional investors, thus complementing the indirect tests of the gamesmanship hypothesis. We found that the stock and government of Canada bond flow of funds data employed for the direct tests of the gamesmanship hypothesis exhibited seasonality which mirrored the seasonality in the returns of stocks and government bonds. As the supply of stocks and government bonds is fairly stable in the short-term, the seasonal change in the demand for funds relative to the supply of funds affected the seasonality in security prices and returns in a way consistent with the gamesmanship hypothesis.

In addition, consistent with the findings of Bouman and Jacobsen (2002), this paper provided support for the expression "Sell in May and Go Away", as the average performance of risky securities was higher in the November to April period than the May to October period.[26] The opposite was true for risk-free bonds. This evidence is also consistent with the gamesmanship hypothesis. There is also support for the motto "As

[26] It has recently come to our attention that a working paper by Doeswijk (2004) attributes the "Sell in May and Go Away" finding to an optimism cycle in the stock market that repeats every year, based on the argument that analysts tend to be optimistic at the beginning of the year and become increasingly pessimistic about earnings from June onwards. While this is true, it is not inconsistent with the gamesmanship hypothesis. This is because, it is not the analysts who drive returns, but rather those who put their money where their mouth is and trade, namely professional portfolio managers. Ackert and Athanassakos (1997), for example, argue that, as portfolio managers rebalance their portfolios at the turn of the year, analysts have a greater incentive to be optimistic early in the year in order to attract new institutional business. As a result, causality runs not from the analysts to professional portfolio managers, but the other way, although there may also be a feedback effect as professional portfolio managers may use analysts' optimistic forecasts as an excuse to invest heavily in equity markets at the beginning of the year.

January Goes, so Goes the Year" and the predictive power of the January stock returns. Consistent with that, not all Januarys experience strong stock performance. It largely depends on whether professional portfolio managers view the year ahead as a good or bad year. A "January" or "Semi-Annual" seasonal was mainly observed when there was no recession or bear market in "January" or the "November-April" period. In recessions or bear markets no, or considerably weakened, January or semi-annual stock return seasonality was documented. The opposite was true for government of Canada bond returns.

Moreover, the paper provided evidence that had investors invested consistently in risky securities in November to April for the last 47 years and rebalanced their portfolios out of risky securities and into government bonds or T-bills for the remaining annual period, they would have outperformed the market by a significant margin.[27]

The paper's findings have implications for ongoing research on the drivers of the return seasonality in financial securities. The seasonality in government bond returns evident in this paper is not consistent with tax-loss selling. Moreover, lack of seasonality in government bond returns in 1957-1980, when there was strong seasonality in 1981-2003, is also be inconsistent with the weather related explanation of seasonality in financial securities.

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[27] While this study deals with indices that are not directly tradable, an investor can still invest in financial securities which trade and are highly correlated with those examined from the CFMRC database. Exchange traded funds (ETFs), such as Barclays' iUnits S&P 60, iUnits S&P Mid Cap, iUnits Government of Canada 5 Year bonds, iUnits Canadian Bonds are all ETFs that mimic large and intermediate cap stock portfolios and long term government bonds, respectively, not of course to mention the existence of a larger number of mutual funds that also mimic the series examined in this study.

Finally, the paper's findings would be of particular usefulness to professional portfolio managers, whose bonus and, indeed, survival are tied to short-term performance vs. their peers who invest with the same mandate, and will help them perform better than average throughout the year. They can also be quite useful to individual investors, as well. This is of particular importance in light of fundamental changes that are taking place in the retirement planning industry now requiring working adults to take personal responsibility for their own financial well being in retirement. Understanding the seasonal behavior of financial markets and the inefficiencies bestowed upon them by institutional factors will help investors secure higher returns and better retirement. Moreover, this paper's support of the gamesmanship hypothesis is in line with the argument in favor of agency related factors as the key drivers of the so called value premium, namely that value stocks beat growth stocks.

Table 1

Summary Statistics of Monthly Returns for the Value Weighted (VW) CFMRC Index, Equally Weighted (EW) CFMRC Index, Government of Canada (GOC) Long Term Bonds and Treasury Bills (TB) and Their Differences for 1957-2003 and Sub-Periods

Panel A: 1957-2003 (Obs=564)

	Mean	Median	Std	Min	Max
EW	0.0153	0.0170	0.0570	-0.2835	0.3723
VW	0.0089	0.0109	0.0455	-0.2302	0.1854
GOC	0.0066	0.0053	0.0259	-0.0996	0.1617
TB	0.0054	0.0048	0.0030	-0.0008	0.0191
EW-VW	0.0064	0.0034	0.0310	-0.0898	0.2896
EW-GOC	0.0087	0.0124	0.0591	-0.3671	0.3266
EW-TB	0.0097	0.0125	0.0573	-0.2936	0.3689
VW-GOC	0.0023	0.0049	0.0463	-0.3138	0.1621
VW-TB	0.0034	0.0058	0.0456	-0.2403	0.1784
GOC-TB	0.0011	0.0001	0.0254	-0.1122	0.1426

Panel B: 1957-1980 (Obs=288)

	Mean	Median	Std	Min	Max
EW	0.0162	0.0198	0.0497	-0.1719	0.2869
VW	0.0093	0.0115	0.0440	-0.1863	0.1854
GOC	0.0032	0.0031	0.0192	-0.0632	0.1146
TB	0.0046	0.0041	0.0023	-0.0008	0.0181
EW-VW	0.0069	0.0047	0.0198	-0.0430	0.1015
EW-GOC	0.0131	0.0168	0.0506	-0.1468	0.2477
EW-TB	0.0116	0.0162	0.0493	-0.1799	0.2799
VW-GOC	0.0062	0.0114	0.0442	-0.1612	0.1623
VW-TB	0.0048	0.0079	0.0437	-0.1944	0.1784
GOC-TB	-0.0014	-0.0006	0.0189	-0.0722	0.1022

Panel C: 1981-2003 (Obs=276)

	Mean	Median	Std	Min	Max
EW	0.0143	0.0131	0.0638	-0.2835	0.3723
VW	0.0085	0.0101	0.0472	-0.2302	0.1489
GOC	0.0102	0.0092	0.0310	-0.0996	0.1617
TB	0.0064	0.0062	0.0034	-0.0003	0.0191
EW-VW	0.0058	0.0003	0.0395	-0.0898	0.2896
EW-GOC	0.0041	0.0040	0.0665	-0.3671	0.3266
EW-TB	0.0077	0.0060	0.0646	-0.2936	0.3689
VW-GOC	-0.0017	-0.0010	0.0481	-0.3138	0.1285
VW-TB	0.0021	0.0022	0.0478	-0.2403	0.1342
GOC-TB	0.0038	0.0020	0.0306	-0.1122	0.1426

Table 2

Average Monthly Returns for the Value Weighted (VW) CFMRC Index, Equally Weighted (EW) CFMRC Index, Government of Canada (GOC) Long Term Bonds and Treasury Bills (TB) for 1957-2003 and Sub-Periods

This Table's results correspond to the following time-series dummy OLS regressions:

$$R_{qt} = \sum_{j=1}^{12} a_j D_{qt}^{j} + e_{qt} \tag{1}$$

where, R_{qt} is the total monthly raw return of the CFMRC Value Weighted Total Return Index or the Equally Weighted Total Return Index or the Government of Canada Bond Index, or the T-bill index in month t, D^{j}_{qt} is a dummy variable that is equal to 1 if the current month is month j and equal to zero otherwise. This model tests whether stock or bond returns in a given month (j=1 to 12) are statistically different from zero. Coefficient a_1 indicates the average raw return of stocks or bonds in our sample for the month of January. The rest of the coefficients (a_2 to a_{12}) represent the average returns from February to December. T-statistics are in brackets. ** stands for statistical significance at the 1% level, and * for statistical significance at the 5% level.

Panel A: 1957-2003 (Obs=564)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
VW R^2=.08 F=4.2**	.022** (3.39)	.006 (.97)	.012 (1.79)	.009 (1.30)	.009 (1.41)	.001 (.10)	.008 (1.28)	.007 (1.08)	-.010 (1.48)	-.003 (.56)	.019** (3.00)	.027** (4.05)
EW R^2=.14 F=7.4**	.053** (6.58)	.018* (2.20)	.019* (2.31)	.014 (1.67)	.014 (1.79)	.001 (.14)	.007 (.87)	.012 (1.47)	-.003 (.34)	-.008 (.98)	.023** (2.81)	.034** (4.18)
GOC R^2=.10 F=5.0**	.005 (1.24)	.004 (1.13)	-.001 (.21)	.004 (.96)	.008* (2.09)	.005 (1.25)	-.001 (.24)	.011** (3.02)	.005 (1.40)	.016** (4.40)	.014** (3.87)	.008* (2.23)
TB R^2=.77 F=149**	.006** (12.6)	.005** (11.8)	.005** (12.2)	.005** (12.0)	.006** (12.6)	.005** (12.0)	.005** (12.3)	.006** (12.5)	.005** (12.0)	.006** (12.9)	.005** (12.1)	.005** (11.9)

Panel B: 1957-1980 (Obs=288)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
VW R^2=.11 F=2.78**	.032** (3.66)	.007 (.76)	.007 (.76)	.008 (.90)	.003 (.29)	.004 (.45)	.012 (1.33)	.005 (.58)	-.001 (.15)	-.011 (1.22)	.022* (2.49)	.025** (2.81)
EW R^2=.21 F=5.92**	.065** (6.68)	.014 (1.44)	.011 (1.08)	.010 (1.67)	.005 (1.79)	.007 (.14)	.017 (.87)	.009 (1.47)	.008 (.34)	-.006 (.98)	.019* (1.99)	.033** (3.45)
GOC R^2=.05 F=1.31	.003 (.52)	.001 (.32)	-.001 (.10)	.008 (1.82)	.001 (.31)	.004 (1.10)	-.002 (.41)	.003 (.72)	.004 (1.02)	.007 (1.72)	.008* (2.12)	.006 (1.58)
TB R^2=.80 F=92**	.005** (9.87)	.005** (9.50)	.005** (9.59)	.004** (9.26)	.005** (10.2)	.004** (9.38)	.004** (9.37)	.005** (9.60)	.004** (9.28)	.005** (9.62)	.005** (9.89)	.005** (9.55)

Panel C: 1981-2003 (Obs=276)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
VW R^2=.09 F=2.1*	.012 (1.18)	.006 (.61)	.017 (1.74)	.009 (.93)	.016 (1.65)	-.003 (.29)	.005 (.50)	.009 (.94)	-.018 (1.89)	-.004 (.39)	.017 (1.75)	.028** (2.89)
EW R^2=.12 F=3.01**	.041** (3.12)	.022 (1.67)	.027* (2.08)	.017 (1.27)	.024 (1.90)	-.005 (.42)	-.004 (.30)	.014 (1.08)	-.014 (1.09)	-.010 (.79)	.026* (2.01)	.034** (2.60)
GOC R^2=.16 F=4.22**	.005 (.77)	.008 (1.23)	-.001 (.15)	.002 (.24)	.015* (2.34)	.007 (1.05)	.002 (.28)	.020** (3.13)	.008 (1.19)	.026** (4.11)	.021** (3.29)	.011 (1.69)
TB R^2=.78 F=77.6**	.007** (9.07)	.006** (8.32)	.006** (8.73)	.006** (8.77)	.006** (8.83)	.006** (8.71)	.006** (8.97)	.007** (9.09)	.006** (8.80)	.007** (9.55)	.006** (8.41)	.006** (8.39)

Table 3

Average Monthly Excess Returns for the Value Weighted (VW) CFMRC Index, Equally Weighted (EW) CFMRC Index and Government of Canada (GOC) Long Term Bonds for 1957-2003 and Sub-Periods

This Table's results correspond to the following time-series dummy OLS regressions:

$$R_{qt} = \sum_{j=1}^{12} a_j D_{qt}^{j} + e_{qt} \qquad (1)$$

where, R_{qt} is the total monthly excess return of the CFMRC Value Weighted Total Return Index or the Equally Weighted Total Return Index or the Government of Canada Bond Index, from each other and the T-bill index in month t, D^j_{qt} is a dummy variable that is equal to 1 if the current month is month j and equal to zero otherwise. This model tests whether stock or bond excess returns in a given month (j=1 to 12) are statistically different from zero. Coefficient a_1 indicates the average excess return of stocks or bonds in our sample for the month of January. The rest of the coefficients (a_2 to a_{12}) represent the average excess returns from February to December. T-statistics are in brackets. ** stands for statistical significance at the 1% level, and * for statistical significance at the 5% level.

Panel A: 1957-2003 (Obs=564)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
EW-VW R^2=.11 F=5.8**	.031* (7.03)	.011** (2.60)	.007 (1.57)	.005 (1.13)	.005 (1.19)	.001 (.11)	-.001 (.31)	.005 (1.08)	.007 (1.57)	-.004 (.97)	.003 (.70)	.007 (1.64)
EW-GOC R^2=.11 F=5.4**	.048** (5.83)	.014 (1.69)	.019* (2.34)	.010 (1.19)	.007 (.79)	-.004 (.43)	.008 (.96)	.001 (.07)	-.008 (.96)	-.024** (2.93)	.008 (.99)	.025** (3.05)
EW-TB R^2=.10 F=5.18*	.048** (5.83)	.013 (1.55)	.013 (1.63)	.008 (1.00)	.009 (1.09)	-.004 (.52)	-.002 (.20)	.006 (.78)	-.008 (1.00)	-.014** (1.68)	.017* (2.14)	.028** (3.39)
VW-GOC R^2=.06 F=3.05**	.018** (2.65)	.002** (.33)	.012 (1.90)	.005 (.75)	.001 (.21)	-.004 (.61)	.009 (1.41)	-.004 (.63)	-.015* (2.26)	-.020** (3.05)	.005 (.78)	.018** (2.75)
VW-TB R^2=.05 F=2.6**	.017** (2.58)	.001** (.17)	.006 (.96)	.003 (.48)	.004 (.55)	-.005 (.72)	.003 (.45)	.002 (.24)	-.015* (2.30)	-.009 (1.43)	.014* (2.17)	.021** (3.24)
GOC-TB R^2=.04 F=2.03*	-.001 (.22)	-.001 (.28)	-.006 (1.69)	-.002 (.48)	.002 (.61)	-.001 (.18)	-.006 (1.73)	.006 (1.57)	-.001 (.04)	.011** (2.93)	.009* (2.48)	.003 (.71)

Panel B: 1957-1980 (Obs=288)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
EW-VW R^2=.27 F=8.3**	.032** (8.66)	.007** (1.94)	.004 (1.02)	.002 (.66)	.002 (.51)	.003 (.92)	.006 (1.56)	.005 (1.22)	.010* (2.54)	.005 (1.39)	-.003 (.73)	.009* (2.29)
EW-GOC R^2=.17 F=4.7**	.061** (6.10)	.013 (1.34)	.011 (1.13)	.005 (.50)	.003 (.35)	.005 (.47)	.021* (2.12)	.007 (.68)	.005 (.52)	-.013** (1.29)	.011 (1.19)	.027** (2.77)
EW-TB R^2=.17 F=4.6**	.060** (6.24)	.009 (.98)	.006 (.62)	.006 (.63)	-.001 (.04)	.003 (.30)	.013 (1.36)	.005 (.53)	.004 (.39)	-.010 (1.06)	.014 (1.51)	.029** (3.00)
VW-GOC R^2=.08 F=2.11*	.028** (3.15)	.006 (.67)	.007 (.83)	.002 (.28)	.002 (.17)	.001 (.13)	.015 (1.71)	.002 (.24)	-.004 (.48)	-.018* (2.01)	.014 (1.55)	.019* (2.12)
VW-TB R^2=.08 F=2.00*	.028** (3.15)	.002** (.25)	.002 (.25)	.004 (.41)	-.002 (.26)	-.001 (.06)	.007 (.83)	.001 (.06)	-.006 (.66)	-.015 (1.75)	.017* (1.97)	.020* (2.31)
GOC-TB R^2=.03 F=.82	-.001 (.09)	-.004 (.98)	-.005 (1.34)	.001 (.29)	-.003 (.98)	-.001 (.44)	-.008* (2.04)	-.001 (.41)	-.001 (.37)	.003 (.66)	.004 (.92)	.001 (.38)

Panel C: 1981-2003 (Obs=276)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
EW-VW R^2=.09 F=2.3**	.029** (3.63)	.016 (1.95)	.010 (1.25)	.008 (.94)	.009 (1.07)	-.003 (.32)	-.009 (1.10)	.005 (.61)	.004 (.52)	-.014 (1.74)	.009 (1.13)	.006 (.72)
EW-GOC R^2=.10 F=2.3**	.036** (2.66)	.014 (1.03)	.028* (2.08)	.015 (1.12)	.010 (.73)	-.012 (.90)	-.006 (.42)	-.006 (.44)	-.022 (1.62)	-.037** (2.71)	.005 (.39)	.023 (1.73)
EW-TB R^2=.09 F=2.1*	.034* (2.54)	.016 (1.19)	.021 (1.58)	.010 (.78)	.018 (1.39)	-.012 (.89)	-.010 (.79)	.008 (.57)	-.021 (1.55)	-.017 (1.30)	.020 (1.52)	.027* (1.97)
VW-GOC R^2=.08 F=1.85*	.007 (.67)	-.002 (.19)	.018 (1.82)	.008 (.76)	.001 (.12)	-.010 (.97)	.003 (.32)	-.011 (1.10)	-.026** (2.65)	-.022* (2.28)	-.004 (.39)	.017 (1.78)
VW-TB R^2=.06 F=1.4	.006 (.55)	.000 (.00)	.010 (1.09)	.003 (.28)	.010 (.99)	-.009 (.93)	-.002 (.16)	.003 (.26)	-.025* (2.52)	-.003 (.32)	.011* (1.12)	.023* (2.26)
GOC-TB R^2=.09 F=2.04*	-.001 (.21)	.002 (.29)	-.007 (1.16)	-.005 (.76)	.009 (1.36)	.001 (.07)	-.005 (.75)	.013* (2.13)	.001 (.20)	.019** (3.08)	.015* (2.37)	.003 (.61)

Table 4
Average Monthly Returns for the Value Weighted (VW) CFMRC Index, Equally Weighted (EW) CFMRC Index, Government of Canada (GOC) Long Term Bonds and Treasury Bills (TB) for the Month of January (and Differences From January) for 1957-2003 and Sub-Periods

This Table's results correspond to the following time-series dummy OLS regressions:

$$R_{qt} = a_0 + \sum_{j=2}^{12} a_j D_{qt}^{j} + e_{qt} \qquad (1)'$$

where, R_{qt} and D^{j}_{qt} are defined as in Table 2 earlier. This model identifies the months in which stock returns are unusually high. It tests whether stock or bond returns in a given month (j=2 to 12) are different from a base month, in this study January. The intercept a_0 indicates the average raw of stocks or bonds in our sample for the month of January. The rest of the coefficients represent the average difference in returns between January and each of the other months. T-statistics are in brackets. ** stands for statistical significance at the 1% level, and * for statistical significance at the 5% level.

Panel A: 1957-2003 (Obs=564)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
VW R^2=.05 F=2.5**	.022** (3.39)	-.016 (1.71)	-.010 (1.13)	-.014 (1.48)	-.013 (1.40)	-.022* (2.33)	-.014 (1.49)	-.015 (1.63)	-.032** (3.44)	-.026** (2.79)	-.003 (.28)	.004 (.47)
EW R^2=.08 F=4.2**	.053** (6.58)	-.035** (3.09)	-.034** (3.02)	-.040 (3.47)	-.040** (3.39)	-.052** (4.55)	-.046** (4.03)	-.041** (3.61)	-.056** (4.89)	-.061** (5.34)	-.030** (2.66)	-.019 (1.70)
GOC R^2=.04 F=2.1*	.005 (1.24)	-.001 (.01)	-.005 (1.03)	-.001 (.20)	.003 (.60)	-.000 (.00)	-.006 (1.04)	.007 (1.26)	.001 (.11)	.012* (2.24)	.010 (1.86)	.004 (.70)
TB R^2=.01 F=0.11	.006** (12.6)	-.001 (.64)	-.001 (.38)	-.001 (.48)	-.000 (.08)	-.001 (.48)	-.001 (.33)	-.001 (.17)	-.001 (.46)	.000 (.09)	-.001 (.44)	-.001 (.51)

Panel B: 1957-1980 (Obs=288)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
VW R^2=.07 F=1.82*	.032** (3.66)	-.026* (2.05)	-.026* (2.05)	-.024 (1.95)	-.030* (2.38)	-.028* (2.27)	-.021 (1.65)	-.027* (2.18)	-.034** (2.70)	-.043** (3.45)	-.01 (.83)	-.008 (.60)
EW R^2=.12 F=3.4**	.065** (6.68)	-.051** (3.70)	-.054** (3.96)	-.054** (3.96)	-.060** (4.40)	-.057** (4.19)	-.047** (3.44)	-.055** (4.02)	-.057** (4.13)	-.070** (5.13)	-.046** (3.32)	-.031* (2.29)
GOC R^2=.03 F=0.731	.004 (1.10)	.004 (.65)	-.005 (.89)	.001 (.21)	-.003 (.59)	-.002 (.29)	-.008 (1.40)	-.001 (.24)	-.001 (.25)	.003 (.50)	.004 (.70)	.002 (.30)
TB R^2=.003 F=0.08	.005** (9.87)	-.001 (.27)	-.001 (.20)	-.001 (.43)	.001 (.24)	-.001 (.35)	-.001 (.36)	-.001 (.19)	-.001 (.42)	-.001 (.18)	.000 (.01)	-.001 (.23)

Panel C: 1981-2003 (Obs=276)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
VW R^2=.06 F=1.43	.012 (1.18)	-.006 (.40)	.005 (.40)	-.002 (0.18)	.005 (.34)	-.014 (1.04)	-.007 (.48)	-.002 (.17)	-.030 (2.17)*	-.008 (.56)	.006 (.41)	.017 (1.21)
EW R^2=.08 F=1.98*	.041** (3.12)	-.019 (1.03)	-.014 (.74)	-.024 (1.31)	-.016 (.87)	-.046* (2.50)	-.045* (2.42)	-.027 (1.45)	-.055** (2.98)	-.051** (2.77)	-.015 (0.79)	-.007 (.37)
GOC R^2=.07 F=1.82*	.005 (.77)	.003 (.32)	-.006 (.65)	-.003 (.37)	.010 (1.11)	.002 (.20)	-.003 (.35)	.015 (1.67)	.003 (.30)	.021* (2.36)	.016 (1.78)	.006 (.64)
TB R^2=.01 F=.12	.007** (9.07)	-.001 (.67)	-.001 (.38)	-.001 (.35)	-.001 (.31)	-.001 (.40)	-.001 (.21)	-.001 (.13)	-.001 (.33)	.001 (.20)	-.001 (.61)	-.001 (.48)

Table 5

Average Monthly Excess Returns for the Value Weighted (VW) CFMRC Index, Equally Weighted (EW) CFMRC Index and Government of Canada (GOC) Long Term Bonds for the Month of January (and Differences From January) for 1957-2003 and Sub-Periods

This Table's results correspond to the following time-series dummy OLS regressions:

$$R_{qt} = a_0 + \sum_{j=2}^{12} a_j D_{qt}^{j} + e_{qt} \qquad (1)'$$

where, R_{qt} and D^{j}_{qt} are defined as in Table 3 earlier. This model identifies the months in which stock excess returns are unusually high. It tests whether stock or bond excess returns in a given month (j=2 to 12) are different from a base month, in this study January. The intercept a_0 indicates the average excess return of stocks or bonds in our sample for the month of January. The rest of the coefficients represent the average difference in excess returns between January and each of the other months. T-statistics are in brackets. ** stands for statistical significance at the 1% level, and * for statistical significance at the 5% level.

Panel A: 1957-2003 (Obs=564)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
EW-VW R^2=.07 F=4.01*	.031** (7.03)	-.019** (3.13)	-.024** (3.86)	-.026** (4.17)	-.026** (4.13)	-.030** (4.89)	-.032** (5.19)	-.026** (4.21)	-.024** (3.86)	-.035** (5.65)	-.028** (4.48)	-.024** (3.81)
EW-GOC R^2=.09 F=4.73*	.048** (5.83)	-.035** (2.97)	-.029* (2.47)	-.039** (3.28)	-.042** (3.56)	-.052** (4.42)	-.041** (3.44)	-.048** (4.07)	-.056** (4.80)	-.073** (6.19)	-.040** (3.42)	-.023* (1.96)
EW-TB R^2=.08 F=4.09*	.048** (5.83)	-.035** (3.06)	-.035** (3.00)	-.040** (3.44)	-.039** (3.38)	-.052** (4.52)	-.046** (4.01)	-.042** (3.60)	-.056** (4.85)	-.061** (5.33)	-.031** (2.64)	-.020 (1.72)
VW-GOC R^2=.06 F=3.20**	.018** (2.65)	-.015 (1.65)	-.005 (.54)	-.013 (1.35)	-.016 (1.73)	-.022* (2.31)	-.008 (.88)	-.022* (2.32)	-.032** (3.47)	-.038** (4.03)	-.012 (1.32)	.001 (.07)
VW-TB R^2=.05 F=2.56**	.017** (2.58)	-.016 (1.71)	-.011 (1.15)	-.014 (1.49)	-.013 (1.45)	-.022* (2.34)	-.014 (1.52)	-.016 (1.67)	-.032** (3.45)	-.026** (2.84)	-.003 (.30)	.004 (.47)
GOC-TB R^2=.04 F=2.11*	-.001 (.22)	-.001 (.04)	-.005 (1.03)	-.001 (.18)	.003 (.59)	-.001 (.03)	-.006 (1.06)	.007 (1.26)	.001 (.13)	.011* (2.22)	.010 (1.90)	.003 (.66)

Panel B: 1957-1980 (Obs=288)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
EW-VW R^2=.18 F=5.38*	.032** (8.66)	-.025** (4.76)	-.029** (5.41)	-.030** (5.66)	-.031** (5.77)	-.029** (5.48)	-.027** (5.02)	-.028** (5.26)	-.023** (4.33)	-.027** (5.15)	-.035** (6.64)	-.024** (4.51)
EW-GOC R^2=.12 F=3.26*	.061** (6.10)	-.047** (3.37)	-.049** (3.52)	-.056** (3.96)	-.057** (4.07)	-.056** (3.98)	-.039** (2.81)	-.054** (3.83)	-.055** (3.94)	-.073** (5.22)	-.049** (3.53)	-.033* (2.36)
EW-TB R^2=.12 F=3.46*	.060** (6.24)	-.051** (3.72)	-.054** (3.98)	-.054** (3.97)	-.061** (4.44)	-.057** (4.20)	-.047** (3.45)	-.055** (4.04)	-.056** (4.14)	-.070** (5.16)	-.046** (3.34)	-.031* (2.29)
VW-GOC R^2=.07 F=1.77	.028** (3.15)	-.022 (1.75)	-.021 (1.64)	-.026* (2.03)	-.027* (2.11)	-.027* (2.13)	-.013 (1.02)	-.026* (2.06)	-.032** (2.57)	-.046** (3.65)	-.014 (1.13)	-.009 (.73)
VW-TB R^2=.07 F=1.84*	.028** (3.15)	-.026* (2.05)	-.026* (2.06)	-.024 (1.94)	-.030* (2.41)	-.028* (2.27)	-.020 (1.64)	-.027* (2.18)	-.033** (2.69)	-.043** (3.47)	-.010 (.83)	-.007 (.59)
GOC-TB R^2=.03 F=.75	-.001 (.09)	-.003 (.62)	-.005 (.88)	.001 (.27)	-.003 (.63)	-.001 (.25)	-.008 (1.37)	-.001 (.22)	-.001 (.20)	.003 (.53)	.004 (.71)	.002 (.33)

Panel C: 1981-2003 (Obs=276)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
EW-VW R^2=.07 F=1.9**	.029** (3.63)	-.014 (1.18)	-.019 (1.68)	-.022 (1.90)	-.021 (1.81)	-.032** (2.79)	-.038** (3.34)	-.024* (2.13)	-.025* (2.20)	-.043** (3.80)	-.020 (1.76)	-.024* (2.06)
EW-GOC R^2=.09 F=2.5**	.036** (2.66)	-.022 (1.15)	-.008 (.41)	-.021 (1.09)	-.026 (1.36)	-.048** (2.52)	-.042* (2.18)	-.042* (2.19)	-.058** (3.03)	-.072** (3.80)	-.031 (1.61)	-.013 (.66)
EW-TB R^2=.07 F=1.91*	.034* (2.54)	-.019 (.99)	-.014 (.72)	-.024 (1.27)	-.016 (.84)	-.046* (2.44)	-.045* (2.37)	-.027 (1.42)	-.055** (2.90)	-.052** (2.73)	-.014 (.75)	-.008 (.40)
VW-GOC R^2=.08 F=1.98*	.007 (.67)	-.008 (.61)	.011 (.82)	.001 (.07)	-.005 (.38)	-.016 (1.16)	-.003 (.25)	-.017 (1.25)	-.033* (2.34)	-.029* (2.09)	-.010 (.75)	.011 (.78)
VW-TB R^2=.06 F=1.43	.006 (.55)	-.006 (.39)	.006 (.37)	-.003 (.20)	.004 (.30)	-.015 (1.04)	-.007 (.50)	-.003 (.21)	-.030* (2.15)	-.009 (.61)	.006 (.39)	.017 (1.21)
GOC-TB R^2=.07 F=1.83*	-.001 (.21)	.003 (.35)	-.006 (.66)	-.003 (.38)	.010 (1.10)	.002 (.20)	-.003 (.38)	.015 (1.64)	.003 (.29)	.021* (2.30)	.016 (1.81)	.005 (.58)

Table 6

Average Semi-Annual (Monthly) Returns for the Value Weighted (VW) CFMRC Index, Equally Weighted (EW) CFMRC Index, Government of Canada (GOC) Long Term Bonds and Treasury Bills (TB) for 1957-2003 and Sub-Periods

This Table's results are from running the regression shown in Table 2 with only two semi-annual periods, November-April and May-October. The November-April period average return is captured by coefficient a_1 (i.e., the coefficient for dummy variable for November-April) and the May-October period average return by coefficient a_2 (i.e., the coefficient for dummy variable for May-October). T-statistics are in brackets. ** stands for statistical significance at the 1% level, and * for statistical significance at the 5% level.

Panel A: 1957-2003 (Obs=564)

	Nov-April	May-Oct
VW R^2=.06 F-Stat=17.7**	.016** (5.90)	.002 (.74)
EW R^2=.10 F-Stat=35.5**	.027** (7.98)	.004 (1.19)
GOC R^2=.06 F-Stat=18.5**	.006** (3.72)	.007** (4.82)
TB R^2=.76 F-Stat=913**	.005** (29.86)	.006** (30.58)

Panel B: 1957-1980 (Obs=288)

	Nov-April	May-Oct
VW R^2=.07 F-Stat=10.9**	.017** (4.64)	.002 (.52)
EW R^2=.13 F-Stat=20.9**	.025** (6.24)	.007 (1.71)
GOC R^2=.03 F-Stat=4.2*	.004* (2.52)	.002 (1.41)
TB R^2=.80 F-Stat=570**	.005** (23.92)	.005** (23.85)

Panel C: 1981-2003 (Obs=274)

	Nov-April	May-Oct
VW R^2=.05 F-Stat=7.1**	.015** (3.71)	.002 (.53)
EW R^2=.09 F-Stat=13.6**	.028** (5.22)	.001 (.15)
GOC R^2=.10 F-Stat=15.9**	.008** (2.85)	.012** (4.87)
TB R^2=.78 F-Stat=481**	.006** (21.45)	.006** (22.40)

Table 7

Average Semi-Annual (Monthly) Excess Returns for the Value Weighted (VW) CFMRC Index, Equally Weighted (EW) CFMRC Index, Government of Canada (GOC) Long Term Bonds and Treasury Bills (TB) for 1957-2003 and Sub-Periods

This Table's results are from running the regression shown in Table 3 with only two semi-annual periods, November-April and May-October. The November-April period average return is captured by coefficient a_1 (i.e., the coefficient for dummy variable for November-April) and the May-October period average return by coefficient a_2 (i.e., the coefficient for dummy variable for May-October). T-statistics are in brackets. ** stands for statistical significance at the 1% level, and * for statistical significance at the 5% level.

Panel A: 1957-2003 (Obs=564)

	Nov-April	May-Oct
EW-VW R^2=.06 F-Stat=17.8**	.011** (5.88)	.002 (1.07)
EW-GOG R^2=.06 F-Stat=18.8**	.021** (6.05)	-.003 (1.01)
EW-TB R^2=.07 F-Stat=19.7**	.021** (6.26)	-.002 (.46)
VW-GOC R^2=.03 F-Stat=8.9**	.010** (3.71)	-.005* (2.00)
VW-TB R^2=.03 F-Stat=8.5**	.011** (3.90)	-.004 (1.31)
GOC-TB R^2=.01 F-Stat=.84	.001 (.20)	.002 (1.28)

Panel B: 1957-1980 (Obs=288)

	Nov-April	May-Oct
EW-VW R^2=.11 F-Stat=18.5**	.009** (5.24)	.005** (3.08)
EW-GOG R^2=.09 F-Stat=13.8**	.021** (5.13)	.005 (1.13)
EW-TB R^2=.09 F-Stat=13.4**	.021** (5.15)	.002 (.59)
VW-GOC R^2=.04 F-Stat=6.1**	.013** (3.49)	-.001 (.10)
VW-TB R^2=.04 F-Stat=6.1**	.012** (3.40)	-.003 (.74)
GOC-TB R^2=.01 F-Stat=1.14	-.001 (.34)	-.002 (1.47)

Panel C: 1981-2003 (Obs=276)

	Nov-April	May-Oct
EW-VW R^2=.05 F-Stat=7.7**	.013** (3.91)	-.001 (.39)
EW-GOG R^2=.06 F-Stat=18.8**	.020** (3.68))	-.012* (2.19)
EW-TB R^2=.06 F-Stat=8.20**	.021** (3.91)	-.006 (1.05)
VW-GOC R^2=.04 F-Stat=5.2**	.007 (1.81)	-.011** (2.67)
VW-TB R^2=.02 F-Stat=2.9*	.009* (2.15)	-.004 (1.09)
GOC-TB R^2=.02 F-Stat=3.1*	.001 (.46)	.006* (2.54)

Table 8

Average Monthly Returns for the Value Weighted (VW) CFMRC Index, Equally Weighted (EW) CFMRC Index, Government of Canada (GOC) Long Term Bonds and Treasury Bills (TB) for 1957-2003 and Sub-Periods – Controlling for January in Recession Years

This Table reports the results from the following time-series dummy OLS regressions with an interaction term in order to additionally capture seasonal effects during recessions, namely the joint effect of the impact of recessions on stock and bond raw returns in January.

$$R_{qt} = \sum_{j=1}^{12} a^*_j D^j_{qt} + b_1^* X_{qt} JAN_{qt} + \varepsilon_{qt} \quad (2)$$

The coefficients of such a regression represent the average return for each month of the year. Not only does this regression differentiate each month from each other, but also captures the effect of recessions on raw returns in the month of January. Independent variable X_{qt} stands for a dummy variable that takes on the value of 1 for the recession months of the year. Variable "JAN" is a binary dummy variable for the month of January. As a result, the security return seasonality in the month of January during recessions will be measured by ($a_1^* + b_1^*$). T-statistics are in brackets. ** stands for statistical significance at the 1% level, and * for statistical significance at the 5% level.

Panel A: 1957-2003 (Obs=564)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan*Rec
VW R^2=0.10 F=4.86**	0.025** (3.86)	0.009 (1.44)	0.014* (2.21)	0.011 (1.66)	0.011 (1.71)	0.003 (0.39)	0.011 (1.70)	0.010 (1.56)	-0.007 (1.01)	-0.001 (0.09)	0.023** (3.52)	0.030** (4.52)	-0.028** (3.48)
EW R^2=0.16 F=7.89**	0.057** (7.05)	0.022** (2.67)	0.022** (2.73)	0.016* (2.03)	0.017* (2.09)	0.004 (0.43)	0.010 (1.29)	0.016 (1.94)	0.001 (0.12)	-0.004 (0.52)	0.027** (3.33)	0.038** (4.65)	-0.022** (3.45)
GOC R^2=0.10 F=4.87**	0.004 (1.00)	0.003 (0.89)	-0.002 (0.41)	0.003 (0.78)	0.007 (1.94)	0.004 (1.11)	-0.002 (0.44)	0.010** (2.77)	0.004 (1.16)	0.016** (4.14)	0.014** (3.57)	0.008* (1.98)	0.005 (1.72)
TB R^2=0.78 F=145.52**	0.005** (12.06)	0.005 (11.28)	0.005** (11.76)	0.005** (11.72)	0.005** (12.40)	0.005** (11.83)	0.005** (11.84)	0.005** (11.96)	0.005** (11.55)	0.005** (12.34)	0.005** (11.46)	0.005** (11.33)	0.002** (4.75)

Panel B: 1957-1980 (Obs=288)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan*Rec
VW R^2=.0.12 F=2.76**	0.026* (2.58)	0.007 (0.76)	0.007 (0.76)	0.008 (0.91)	0.003 (0.29)	0.004 (0.45)	0.012 (1.33)	0.005 (0.58)	-0.001 (0.15)	-0.011 (1.22)	0.022* (2.50)	0.025** (2.82)	-0.033 (1.51)
EW R^2=0.22 F=5.81**	0.056** (5.08)	0.014 (1.45)	0.011 (1.09)	0.011 (1.09)	0.005 (0.47)	0.007 (0.76)	0.018 (1.82)	0.010 (1.01)	0.008 (0.85)	-0.006 (0.58)	0.019* (2.00)	0.034** (3.46)	-0.046 (1.95)
GOC R^2=0.0595 F=1.34	0.002 (0.40)	0.001 (0.19)	-0.001 (0.16)	0.006 (1.40)	0.001 (0.27)	0.003 (0.70)	-0.003 (0.87)	0.003 (0.76)	0.003 (0.76)	0.007 (1.81)	0.008* (2.10)	0.006 (1.53)	0.012 (1.27)
TB R^2=0.80 F=84.78**	0.005** (8.60)	0.005** (9.48)	0.005** (9.57)	0.004** (9.25)	0.005** (10.20)	0.005** (9.36)	0.005** (9.35)	0.005** (9.59)	0.005** (9.27)	0.005** (9.61)	0.005** (9.87)	0.005** (9.53)	0.001 (0.39)

Panel C: 1981-2003 (Obs=276)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan*Rec
VW R^2=0.10 F=2.28**	0.014 (1.41)	0.008 (0.85)	0.019* (1.98)	0.011 (1.09)	0.018 (1.82)	-0.001 (0.14)	0.008 (0.81)	0.012 (1.24)	-0.016 (1.57)	0.007 (0.69)	0.020* (2.06)	0.031** (3.13)	-0.017* (2.14)
EW R^2=0.13 F=2.95**	0.043** (3.27)	0.024 (1.82)	0.030* (2.23)	0.018 (1.38)	0.026* (2.00)	-0.004 (0.31)	-0.001 (0.09)	0.017 (1.28)	-0.011 (0.87)	-0.008 (0.57)	0.029* (2.20)	0.036** (2.75)	-0.016 (1.46)
GOC R^2=0.17 F=4.01**	0.004 (0.64)	0.007 (1.09)	-0.002 (0.28)	0.001 (0.16)	0.014* (2.25)	0.006 (0.96)	0.001 (0.10)	0.019** (2.93)	0.007 (1.01)	0.025** (3.90)	0.020** (3.08)	0.010 (1.55)	0.006 (1.19)
TB R^2=0.81 F=88.18**	0.006** (9.02)	0.006** (8.22)	0.006** (8.67)	0.006** (8.99)	0.006** (9.06)	0.006** (8.92)	0.006** (8.64)	0.006** (8.76)	0.006** (8.45)	0.006** (9.26)	0.005** (8.03)	0.006** (8.28)	0.004** (6.93)

Table 9

Average Monthly Excess Returns for the Value Weighted (VW) CFMRC Index, Equally Weighted (EW) CFMRC Index and Government of Canada (GOC) Long Term Bonds for 1957-2003 and Sub-Periods --Controlling for January in Recession Years

This Table reports the results from the following time-series dummy OLS regressions with an interaction term in order to additionally capture seasonal effects during recessions, namely the joint effect of the impact of recessions on stock and bond excess returns in January.

$$R_{qt} = \sum_{j=1}^{12} a^*_j D^j_{qt} + b_1^* X_{qt} JAN_{qt} + \varepsilon_{qt} \qquad (2)$$

The coefficients of such a regression represent the average excess return for each month of the year. Not only does this regression differentiate each month from each other, but also captures the effect of recessions on excess returns in the month of January. Independent variable X_{qt} stands for a dummy variable that takes on the value of 1 for the recession months of the year. Variable "JAN" is a binary dummy variable for the month of January. As a result, the security return seasonality in the month of January during recessions will be measured by (a_1* + b_1*). T-statistics are in brackets. ** stands for statistical significance at the 1% level, and * for statistical significance at the 5% level.

Panel A: 1957-2003 (Obs=564)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan*Rec
EW-VW R^2=0.11 F=5.43**	0.032** (7.12)	0.012** (2.73)	0.008 (1.70)	0.006 (1.25)	0.006 (1.28)	0.001 (0.21)	-0.001 (0.17)	0.006 (1.23)	0.008 (1.71)	-0.004 (0.80)	0.004 (0.87)	0.008 (1.78)	-0.004 (1.15)
EW-GOC R^2=0.13 F=6.48**	0.053** (6.42)	0.018* (2.20)	0.024** (2.85)	0.013 (1.63)	0.010 (1.15)	-0.001 (0.08)	0.012 (1.46)	0.005 (0.63)	-0.003 (0.41)	-0.020** (2.39)	0.014 (1.62)	0.030** (3.63)	-0.037** (4.15)
EW-TB R^2=0.12 F=5.94**	0.052** (6.35)	0.017* (2.05)	0.017* (2.08)	0.011 (1.39)	0.011 (1.41)	-0.002 (0.21)	0.005 (0.64)	0.010 (1.28)	-0.004 (0.51)	-0.010 (1.19)	0.022** (2.70)	0.032** (3.91)	-0.024** (3.70)
VW-GOC R^2=0.09 F=4.44**	0.022** (3.28)	0.006 (0.93)	0.016* (2.44)	0.008 (1.21)	0.004 (0.59)	-0.002 (0.24)	0.013 (1.95)	-0.001 (0.04)	-0.011 (1.67)	-0.016* (2.47)	0.010 (1.46)	0.022** (3.37)	-0.023** (4.46)
VW-TB R^2=0.08 F=3.61**	0.021** (3.11)	0.005 (0.69)	0.010 (1.42)	0.006 (0.88)	0.006 (0.88)	-0.003 (0.40)	0.006 (0.91)	0.005 (0.75)	-0.012 (1.79)	-0.006 (0.92)	0.018** (2.75)	0.025** (3.77)	-0.025** (3.82)
GOC-TB R^2=0.04 F=1.98*	-0.001 (0.38)	-0.002 (0.44)	-0.007 (1.82)	-0.002 (0.60)	0.002 (0.50)	-0.001 (0.28)	-0.007 (1.86)	0.005 (1.39)	-0.001 (0.20)	0.010** (2.75)	0.008* (2.27)	0.002 (0.54)	0.004 (1.19)

Panel B: 1957-1980 (Obs=288)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan*Rec
EW-VW R^2=0.27 F=7.85**	0.030** (7.06)	0.007 (1.94)	0.004 (1.02)	0.003 (0.67)	0.002 (0.51)	0.003 (0.92)	0.006 (1.57)	0.005 (1.22)	0.010* (2.54)	0.005 (1.39)	-0.003 (0.73)	0.009* (2.30)	-0.013 (1.46)
EW-GOC R^2=0.18 F=4.52**	0.053** (4.80)	0.013 (1.34)	0.011 (1.13)	0.005 (0.50)	0.004 (0.35)	0.005 (0.47)	0.021* (2.13)	0.007 (0.68)	0.005 (0.52)	-0.013 (1.29)	0.011 (1.12)	0.028** (2.77)	-0.034 (1.39)
EW-TB R^2=0.18 F=4.60**	0.051** (4.69)	0.010 (0.99)	0.006 (0.62)	0.006 (0.63)	-0.001 (0.04)	0.003 (0.30)	0.013 (1.37)	0.005 (0.54)	0.004 (0.39)	-0.010 (1.06)	0.015 (1.52)	0.029** (3.02)	-0.046 (1.94)
VW-GOC R^2=0.09 F=2.01*	0.024* (2.37)	0.006 (0.67)	0.007 (0.83)	0.003 (0.28)	0.002 (0.17)	0.001 (0.13)	0.015 (1.71)	0.002 (0.24)	-0.004 (0.48)	-0.018* (2.01)	0.014 (1.55)	0.019* (2.12)	-0.021 (0.94)
VW-TB R^2=0.09 F=2.01*	0.021 * (2.13)	0.002 (0.25)	0.002 (0.25)	0.004 (0.41)	-0.002 (0.26)	-0.001 (0.06)	0.007 (0.83)	0.001 (0.06)	-0.006 (0.66)	-0.015 (1.75)	0.017* (1.98)	0.020* (2.32)	-0.032 (1.50)
GOC-TB R^2=0.04 F=0.88	-0.003 (0.65)	-0.004 (0.98)	-0.005 (1.34)	0.001 (0.29)	-0.004 (0.98)	-0.002 (0.44)	-0.008 (2.04)	-0.002 (0.41)	-0.001 (0.37)	0.003 (0.66)	0.004 (0.92)	0.002 (0.38)	0.012 (1.25)

Panel C: 1981-2003 (Obs=276)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan*Rec
EW-VW R^2=0.09 F=2.10*	0.030** (3.58)	0.016 (1.91)	0.010 (1.22)	0.008 (0.92)	0.009 (1.05)	-0.003 (0.34)	-0.009 (1.11)	0.005 (0.57)	0.004 (0.49)	-0.014 (1.75)	0.009 (1.09)	0.006 (0.69)	-0.001 (0.20)
EW-GOC R^2=0.11 F=2.53**	0.039** (2.88)	0.017 (1.25)	0.031** (2.30)	0.017 (1.27)	0.012 (0.88)	-0.010 (0.76)	-0.002 (0.13)	-0.002 (0.14)	0.018 (1.32)	-0.033* (2.41)	0.009 (0.68)	0.026 (1.94)	-0.022* (1.99)
EW-TB R^2=0.10 F=2.18*	0.037** (2.74)	0.018 (1.38)	0.023 (1.77)	0.012 (0.91)	0.020 (1.53)	-0.010 (0.76)	-0.007 (0.52)	0.011 (0.82)	-0.017 (1.29)	-0.014 (1.04)	0.024 (1.77)	0.029* (2.17)	-0.020 (1.79)
VW-GOC R^2=0.11 F=2.41**	0.010 (0.99)	0.001 (0.13)	0.021* (2.16)	0.010 (0.99)	0.003 (0.34)	-0.008 (0.77)	0.007 (0.74)	-0.007 (0.68)	-0.022* (2.23)	-0.018 (1.87)	0.001 (0.03)	0.021* (2.11)	-0.024** (2.92)
VW-TB R^2=0.08 F=1.81*	0.008 (0.84)	0.003 (0.28)	0.014 (1.38)	0.005 (0.47)	0.012 (1.19)	-0.007 (0.74)	0.002 (0.22)	0.006 (0.64)	-0.021* (2.14)	0.001 (0.06)	0.015 (1.50)	0.026* (2.56)	-0.022** (2.62)
GOC-TB R^2=0.09 F=1.90*	-0.002 (0.26)	0.002 (0.24)	-0.008 (1.20)	-0.005 (0.79)	0.008 (1.32)	0.001 (0.03)	-0.005 (0.81)	0.013 (2.04)	0.001 (0.13)	0.019** (2.97)	0.014* (2.27)	0.004 (0.55)	0.003 (0.48)

Table 10

Average Semi-Annual (Monthly) Returns for the Value Weighted (VW) CFMRC Index, Equally Weighted (EW) CFMRC Index, Government of Canada (GOC) Long Term Bonds and Treasury Bills (TB) for 1957-2003 and Sub-Periods – Controlling for November-April in Recession Years

This Table's results are from running the regression shown in Table 8 with only two semi-annual periods, November-April and May-October. The November-April period average return is captured by coefficient a_1 (i.e., the coefficient for dummy variable for November-April) and the May-October period average return by coefficient a_2 (i.e., the coefficient for dummy variable for May-October). Variable "JAN" is a binary dummy variable for the months of November to April here. As a result, the security return seasonality in the period November to April during recessions will be measured by (a_1* + b_1*). T-statistics are in brackets. ** stands for statistical significance at the 1% level, and * for statistical significance at the 5% level.

Panel A: 1957-2003 (Obs=564)

	Nov-April	May-October	NovApril*Recessions
VW R^2=.07 F-Stat=3.2**	.018** (6.23)	.002 (.75)	-.014* (2.03)
EW R^2=.11 F-Stat=23.0*	.029** (8.08)	.004 (1.19)	-.017 (1.90)
GOC R^2=.07 F-Stat=13.32**	.005** (2.74)	.007** (4.83)	.007 (1.66)
TB R^2=.77 F-Stat=615.64**	.005** (26.46)	.006** (30.70)	.001* (2.33)

Panel B: 1957-1980 (Obs=288)

	Nov-April	May-October	NovApril*Recessions
VW R^2=.08 F-Stat=8.26**	.020** (4.92)	.002 (.52)	-.015 (1.69)
EW R^2=.14 F-Stat=15.73**	.030** (6.60)	.007 (1.72)	-.022* (2.19)
GOC R^2=.03 F-Stat=3.07*	.003 (1.85)	.002 (1.41)	.004 (.94)
TB R^2=.80 F-Stat=379**	.005** (21.32)	.005** (23.81)	.001 (.27)

Panel C: 1981-2003 (Obs=274)

	Nov-April	May-October	NovApril*Recessions
VW R^2=.05 F-Stat=5.20**	.017** (3.91)	.002 (.53)	-.015 (1.22)
EW R^2=.09 F-Stat=9.17**	.029** (5.07)	.001 (.15)	-.009 (.58)
GOC R^2=.11 F-Stat=11.55**	.006* (2.08)	.013** (4.89)	.013 (1.62)
TB R^2=.79 F-Stat=339.53**	.006** (19.10)	.006** (22.90)	.003** (3.64)

Table 11

Average Semi-Annual (Monthly) Excess Returns for the Value Weighted (VW) CFMRC Index, Equally Weighted (EW) CFMRC Index, Government of Canada (GOC) Long Term Bonds and Treasury Bills (TB) for 1957-2003 and Sub-Periods– Controlling for November-April in Recession Years

This Table's results are from running the regression shown in Table 9 with only two semi-annual periods, November-April and May-October. The November-April period average excess return is captured by coefficient a_1 (i.e., the coefficient for dummy variable for November-April) and the May-October period average excess return by coefficient a_2 (i.e., the coefficient for dummy variable for May-October). Variable "JAN" is a binary dummy variable for the months of November to April here. As a result, the security excess return seasonality in the period November to April during recessions will be measured by (a_1* + b_1*). T-statistics are in brackets. ** stands for statistical significance at the 1% level, and * for statistical significance at the 5% level.

Panel A: 1957-2003 (Obs=564)

	Nov-April	May-October	NovApril*Recessions
EW-VW R^2=.06 F-Stat=11.96**	.011** (5.57)	.002 (1.07)	-.002 (.49)
EW-GOG R^2=.07 F-Stat=14.91**	.025** (6.61)	-.003 (1.02)	-.024** (2.60)
EW-TB R^2=.07 F-Stat=14.55**	.024** (6.55)	-.002 (.46)	-.018* (2.00)
VW-GOC R^2=.05 F-Stat=8.9**	.014** (4.61)	-.005* (2.00)	-.022** (2.96)
VW-TB R^2=.04 F-Stat=7.28**	.013** (4.46)	-.004 (1.31)	-.016* (2.20)
GOC-TB R^2=.007 F-Stat=1.24	-.001 (.39)	.002 (1.28)	.006 (1.43)

Panel B: 1957-1980 (Obs=288)

	Nov-April	May-October	NovApril*Recessions
EW-VW R^2=.12 F-Stat=13.35**	.010** (5.46)	.005** (3.09)	-.007 (1.68)
EW-GOG R^2=.11 F-Stat=11.47**	.026** (5.75)	.005 (1.14)	-.026* (2.51)
EW-TB R^2=.010 F-Stat=10.72**	.025** (5.63)	.002 (.60)	-.023** (2.22)
VW-GOC R^2=.06 F-Stat=5.57**	.017** (4.07)	-.001 (.10)	-.019* (2.09)
VW-TB R^2=.05 F-Stat=5.04**	.015** (3.82)	-.003 (.75)	-.020 (1.72)
GOC-TB R^2=.01 F-Stat=1.04	-.001 (.71)	-.002 (1.47)	.004 (.92)

Panel C: 1981-2003 (Obs=276)

	Nov-April	May-October	NovApril*Recessions
EW-VW R^2=.05 F-Stat=5.24**	.012** (3.45)	-.001 (.39)	.005 (.54)
EW-GOG R^2=.07 F-Stat=6.72**	.023** (3.92)	-.012* (2.19)	-.022 (1.34)
EW-TB R^2=.06 F-Stat=5.64**	.023** (3.91)	-.006 (1.05)	-.012 (.74)
VW-GOC R^2=.05 F-Stat=5.26**	.011* (2.53)	-.011** (2.69)	-.027* (2.28)
VW-TB R^2=.03 F-Stat=2.68*	.011* (2.55)	-.004 (1.09)	-.018 (1.49)
GOC-TB R^2=.03 F-Stat=2.59*	-.001 (.02)	.006* (2.45)	.010 (1.25)

Table 12

Panel A: Summary Statistics of Quarterly Flow of Funds ($Millions) in Stocks and Government of Canada Bonds for the Period 1981:Q1 to 2005:Q3

	Mean	Median	Min	Max
Stock Flows				
Overall	7662	4965	-6332	31698
Quarter1	10402	7459	-499	31698
Quarter2	6822	5250	-6332	27348
Quarter3	6087	4137	-1517	20969
Quarter4	7325	3746	-5319	26587
Government Bond Flows				
Overall	2336	2043	-14115	16286
Quarter1	244	519	-9610	6449
Quarter2	2052	1595	-6028	10106
Quarter3	856	1737	-14115	11336
Quarter4	6354	7393	-11851	16286

Panel B: Average Quarterly Flow of Funds ($Millions) in Stocks and Government of Canada Bonds for the First Quarter (and Differences from the First Quarter) for 1981:Q1 to 2005:Q3

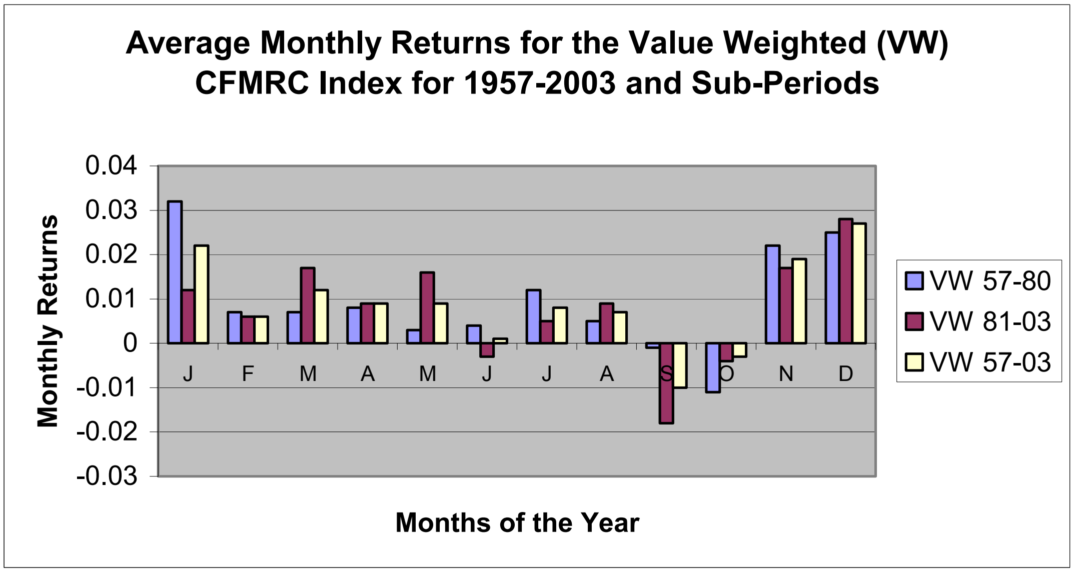
This Table's results correspond to the following time-series dummy OLS regressions:

$$F_{qt} = a_0 + \sum_{i=1}^{4} a_j D^j_{qt} + e_{qt} \qquad (1)''$$

where, F_{qt} is the quarterly flow of funds in stocks or government of Canada bonds by trusteed pension plans, mutual funds, investment dealers, insurance companies and public financial institutions, and D^j_{qt} is a dummy variable that takes on the value of 1 if current quarter is quarter j and zero otherwise. This model identifies the quarters in which fund flows in stocks and government bonds are unusually high. It tests whether stock or government bond fund flows in a given quarter (j=2 to 4) are different from a base quarter, in this case quarter 1. The intercept a_0 indicates the average stock or government bond fund flows in the first quarter. The rest of the coefficients represent the average difference in stock or government bond fund flows between quarter 1 and each of the other quarters. T-statistics are in brackets. ** stands for statistical significance at the 1% level, and * for statistical significance at the 5% level.

	Quarter1	Quarter2	Quarter3	Quarter4
Stock Flows	10402 (6.75)**	-3579 (1.64)	-4314 (1.98)*	-3076 (1.40)
Government of Canada Bond Flows	244 (0.23)	1807 (1.18)	612 (0.40)	6109 (3.96)**

Figure 1



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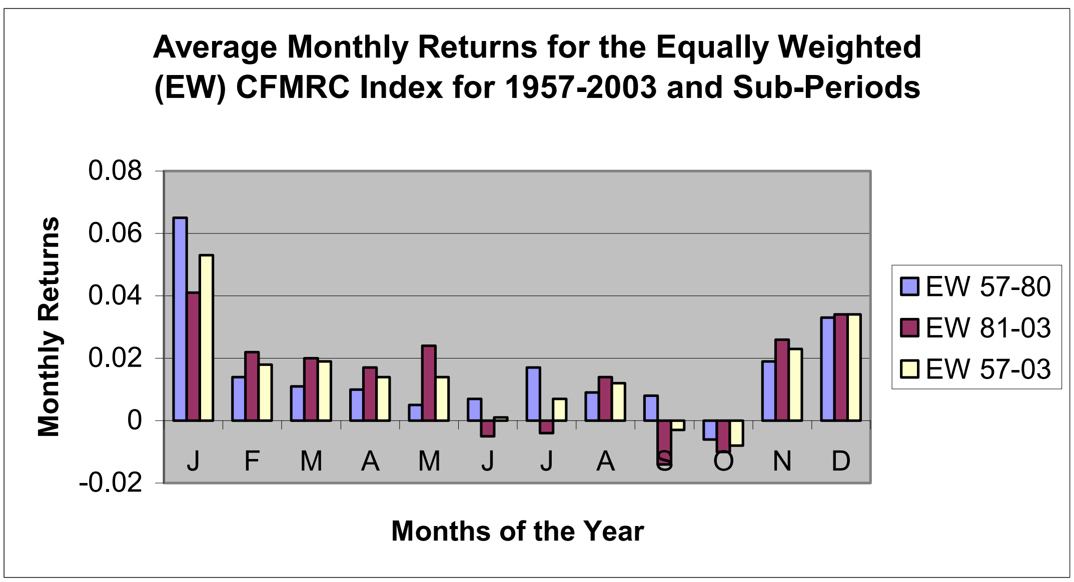

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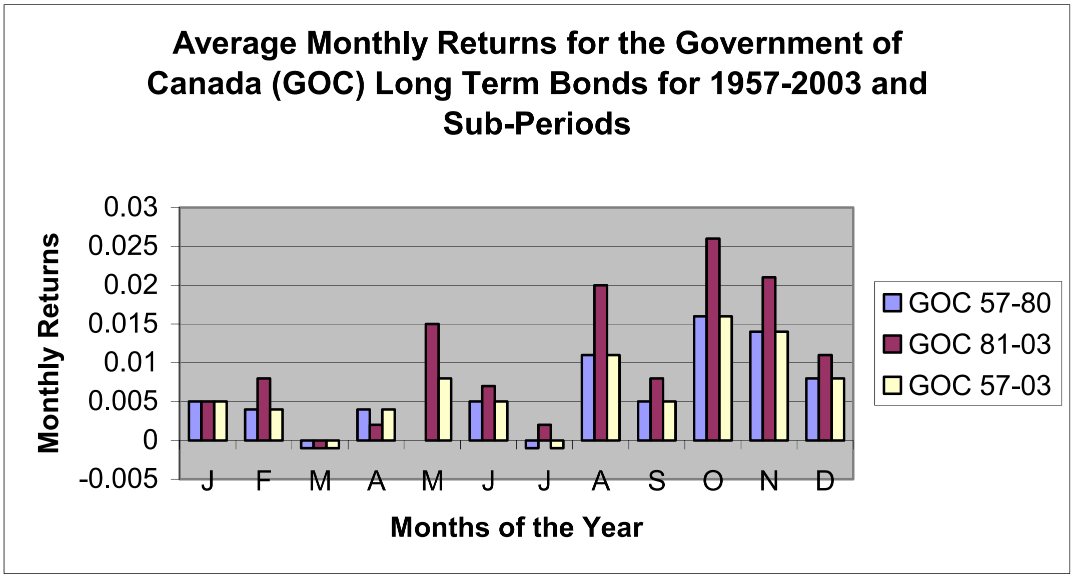

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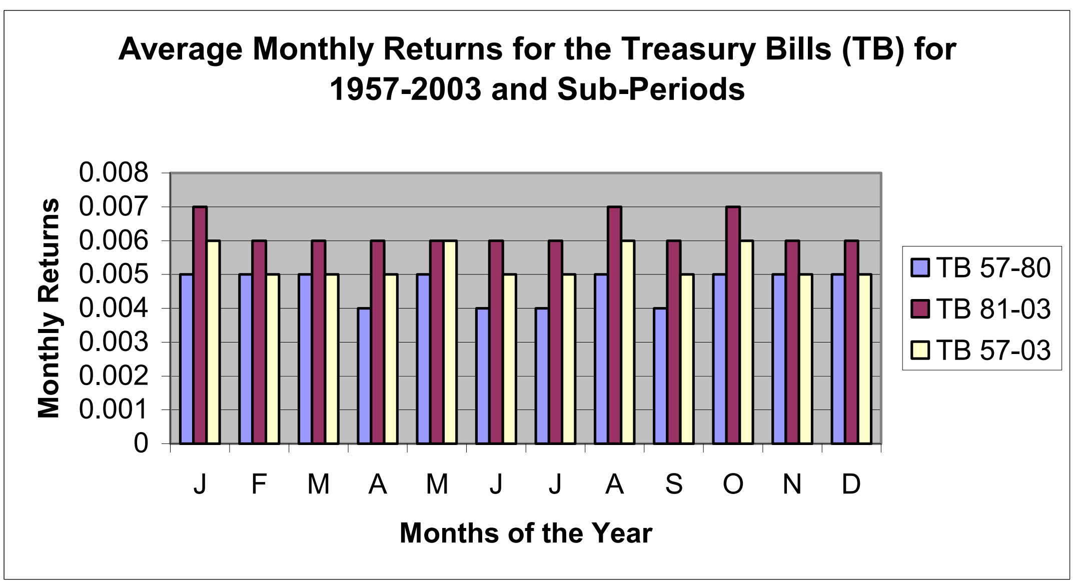

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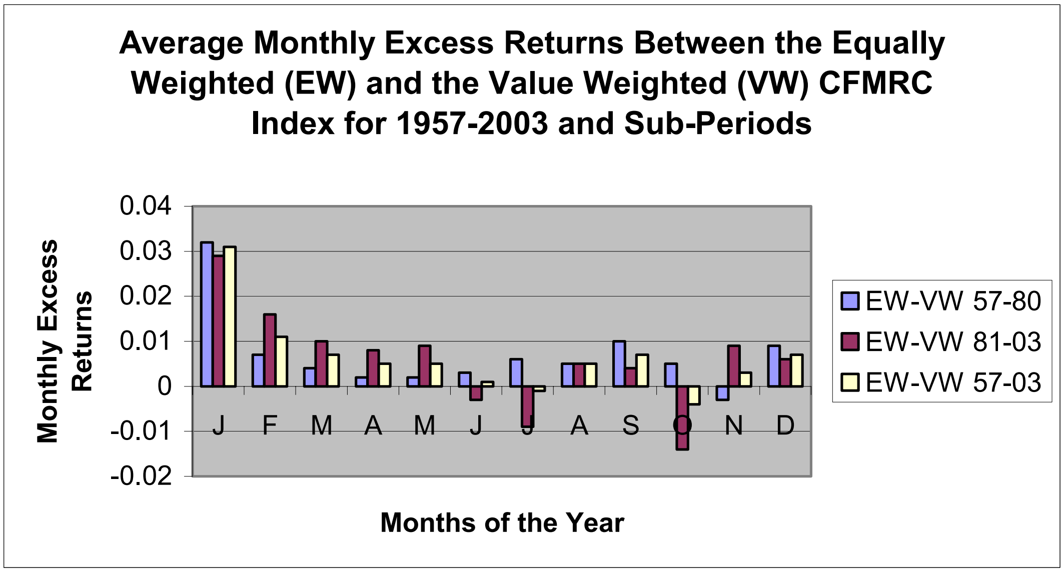

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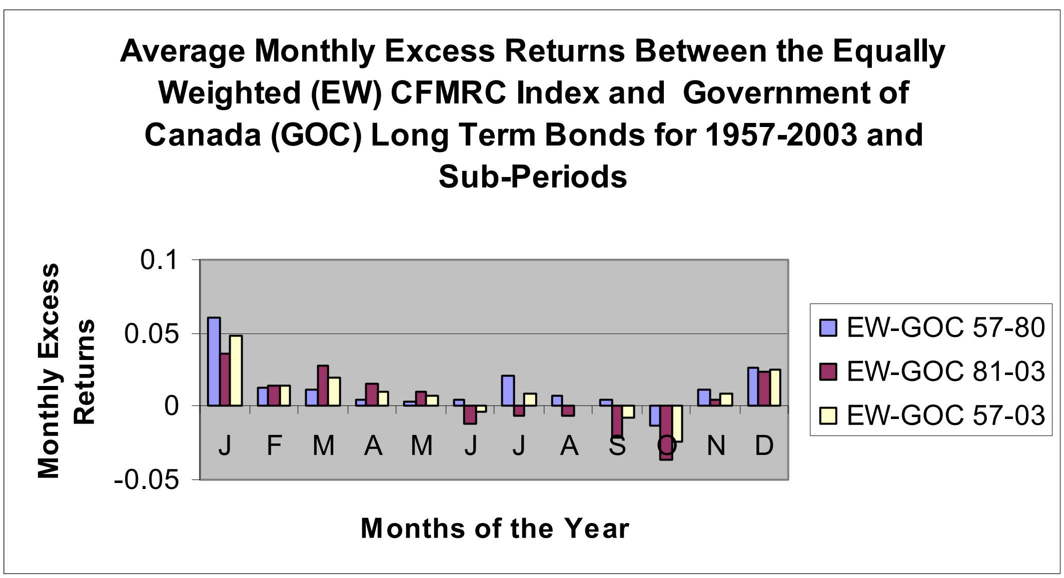

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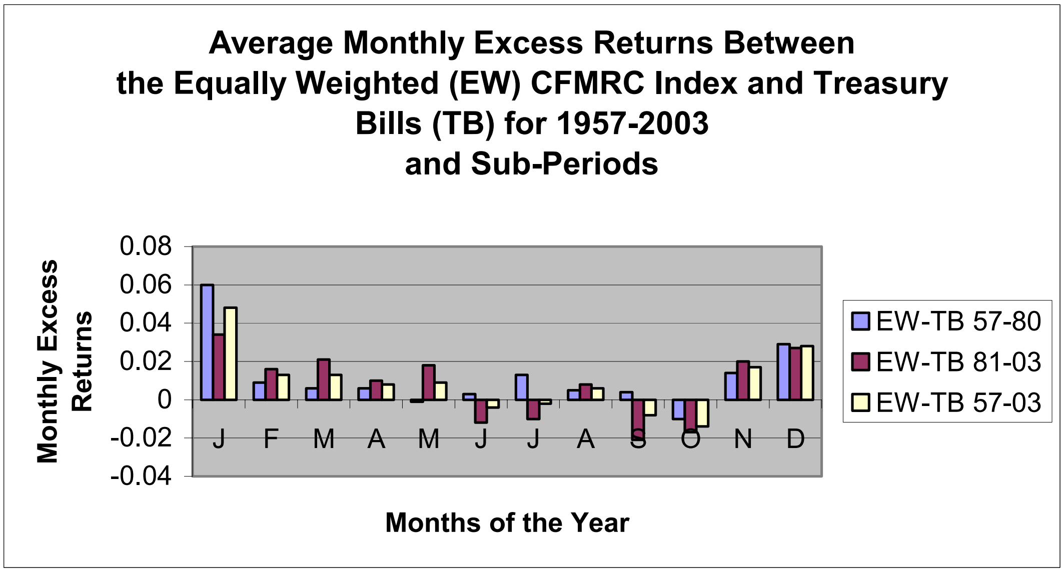

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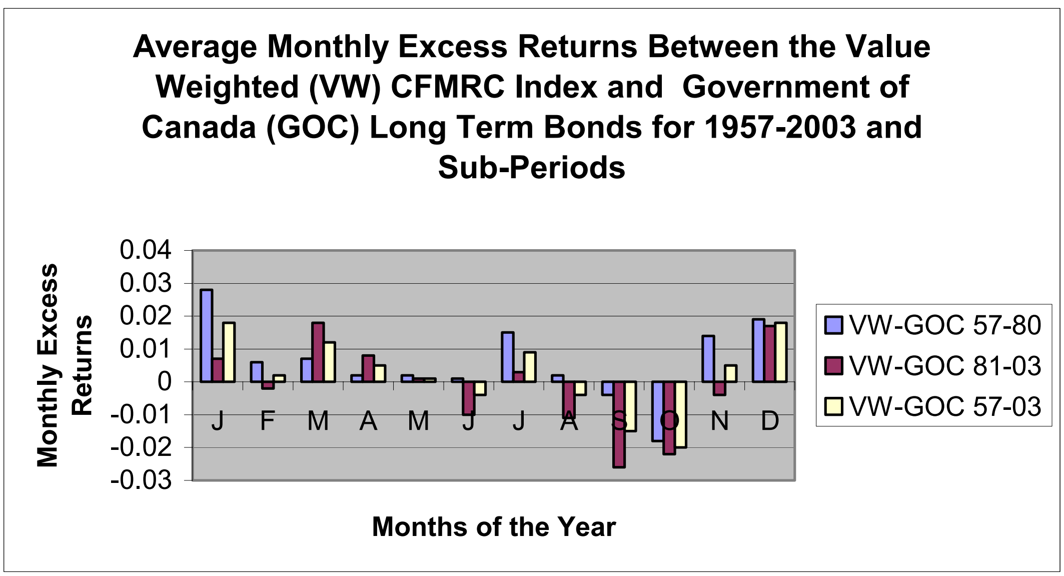
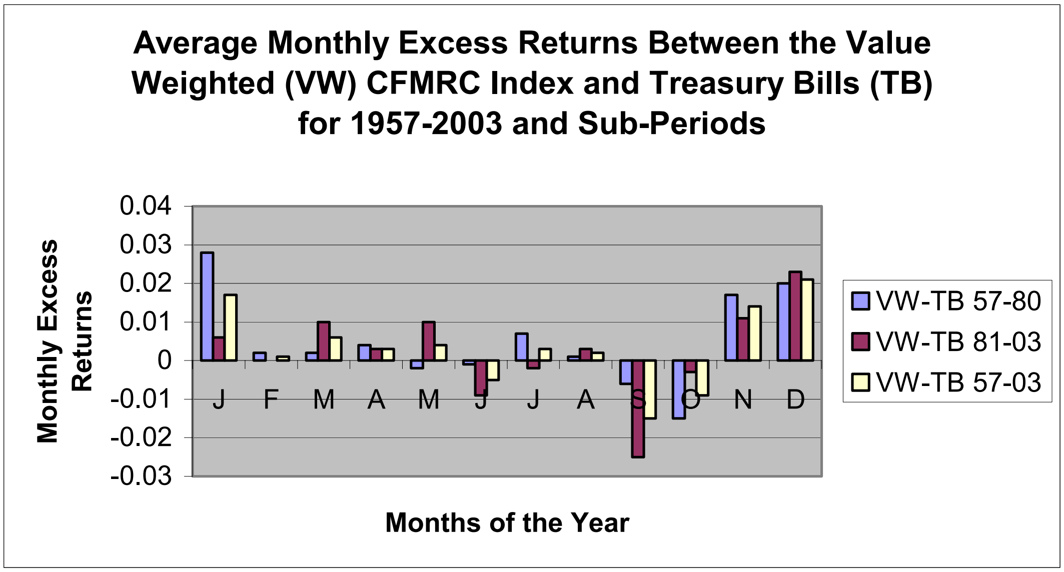


Figure 9



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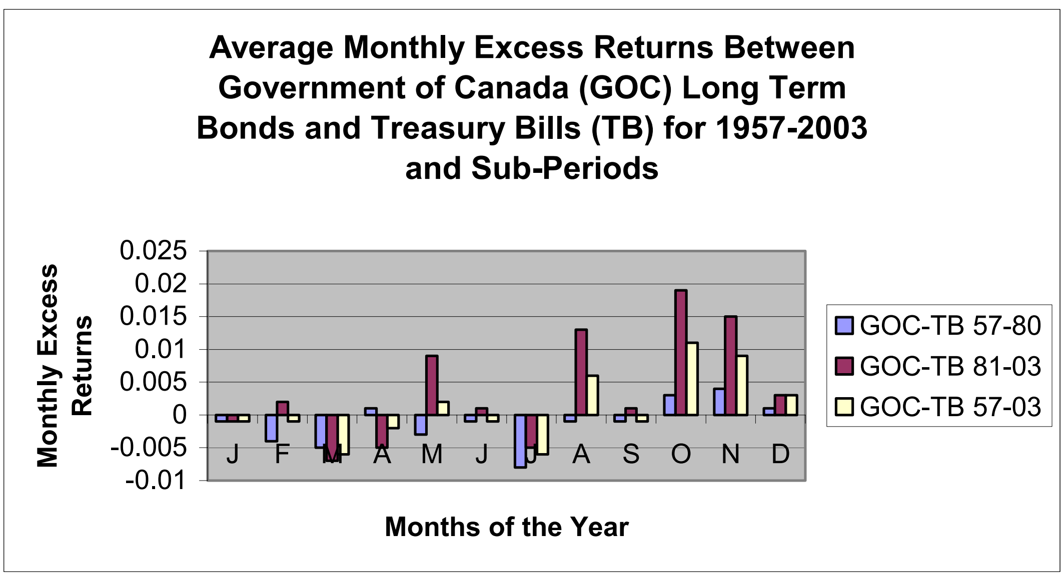

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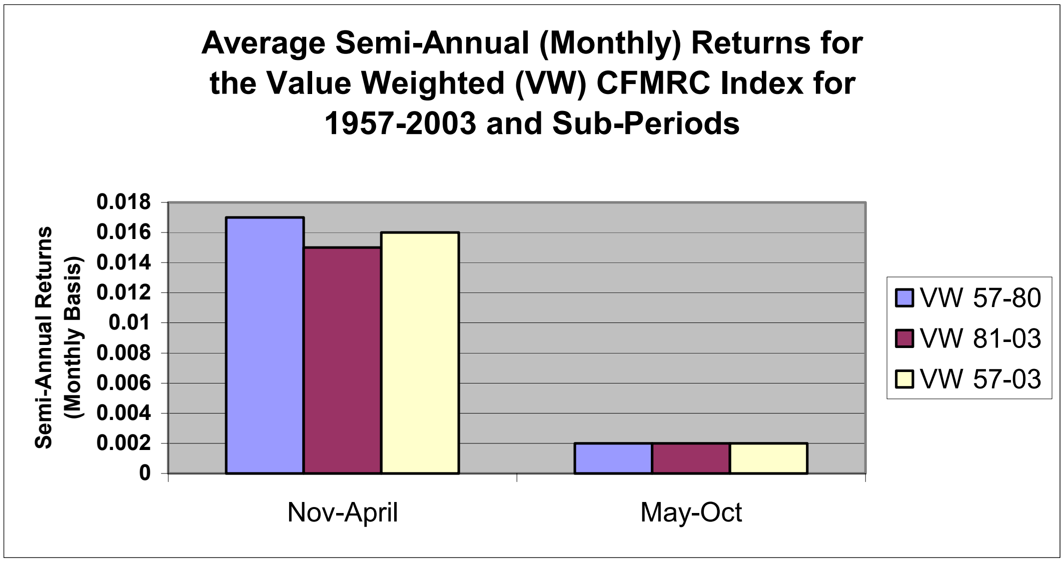

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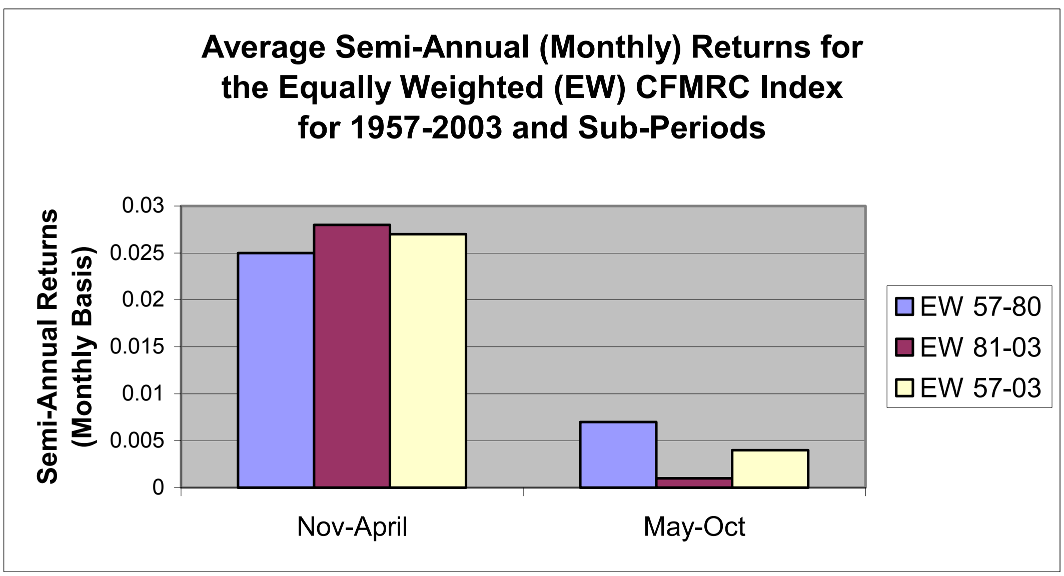

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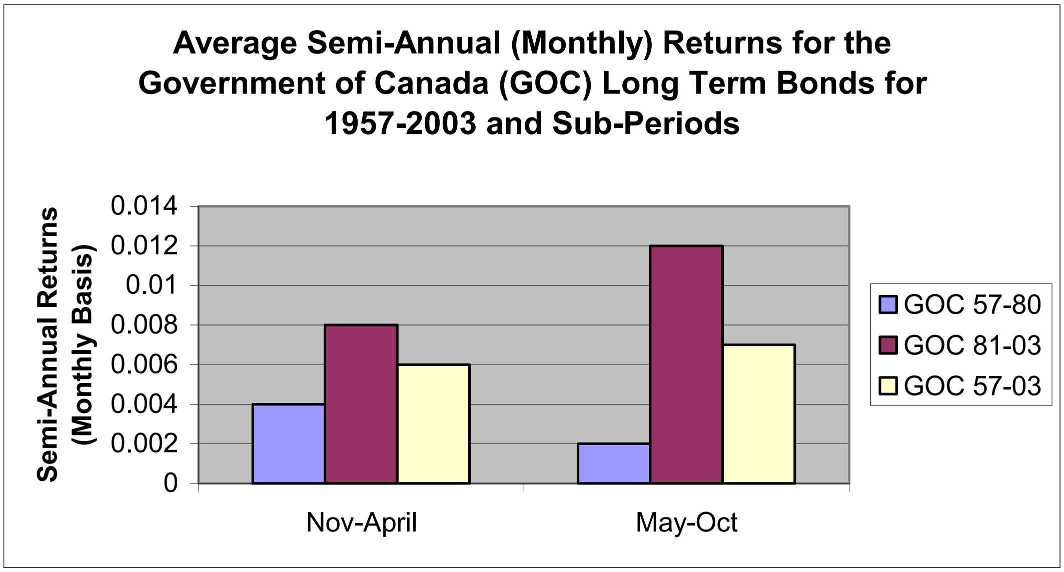

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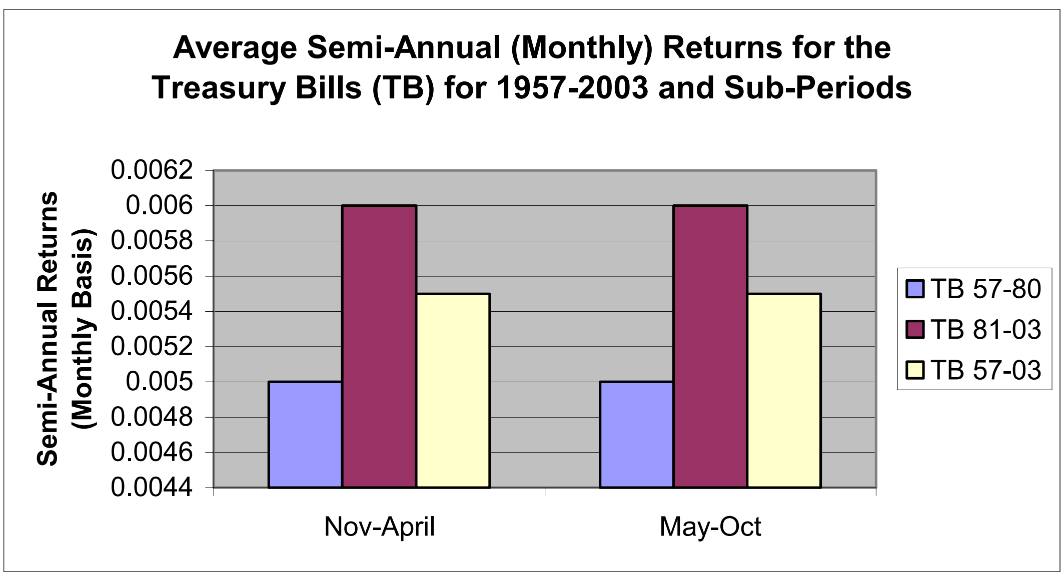

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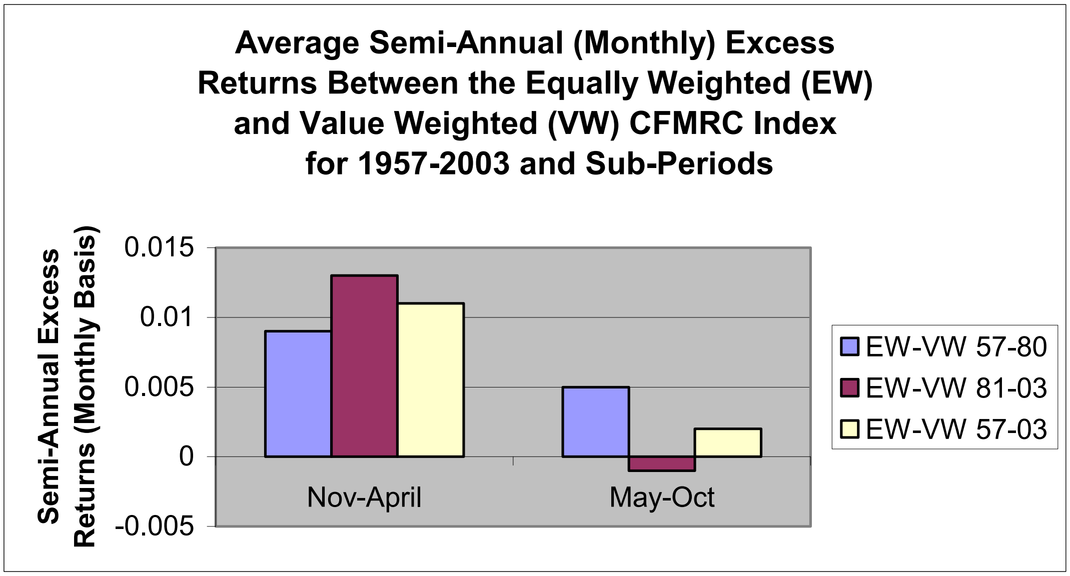

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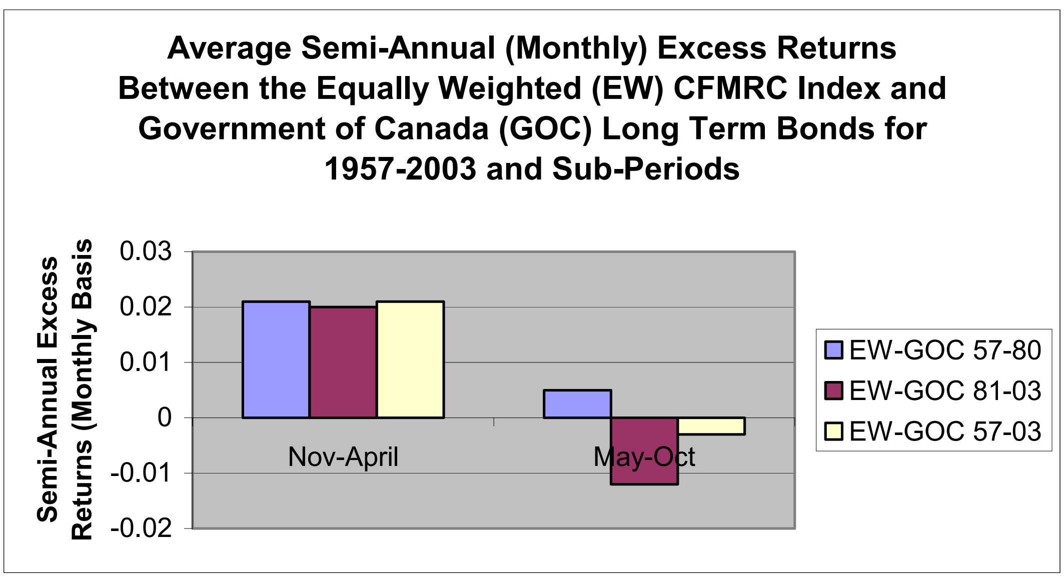

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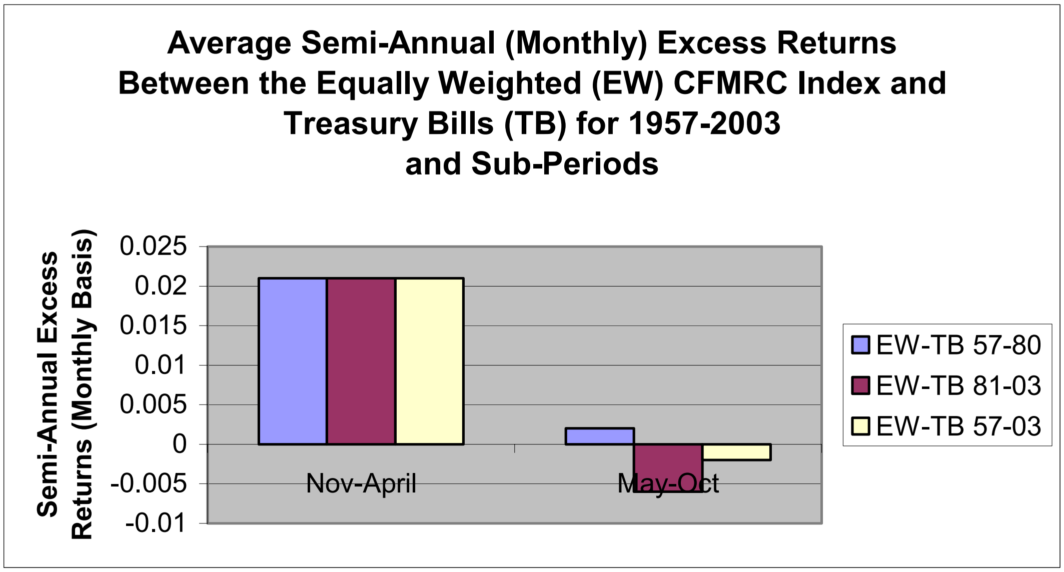

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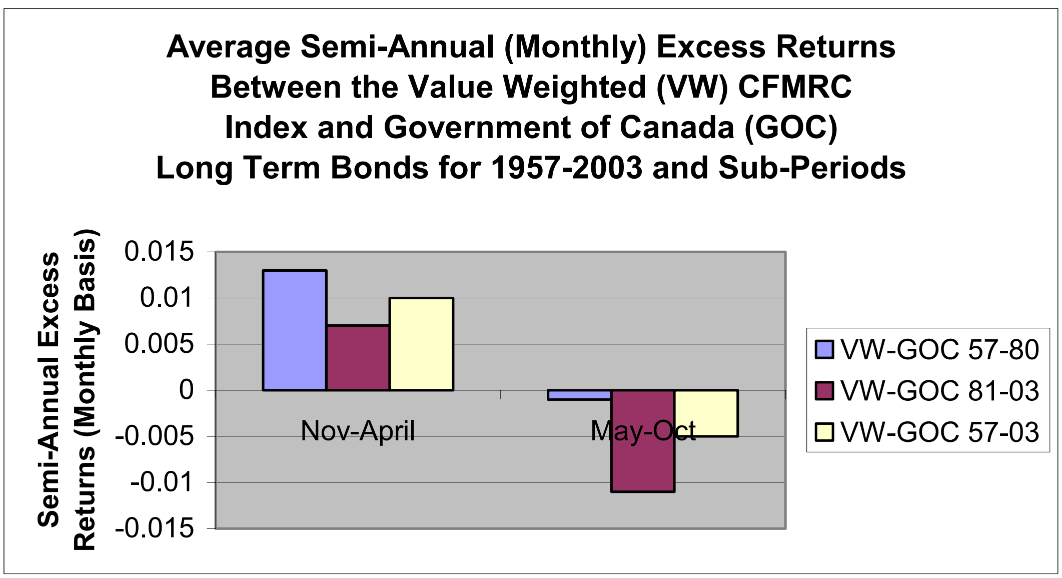

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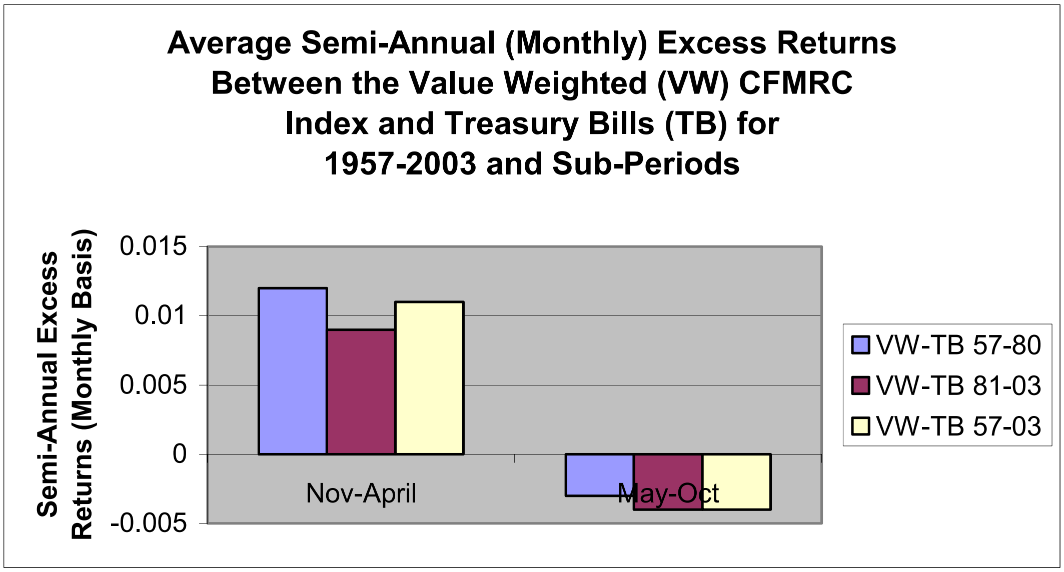


Figure 20

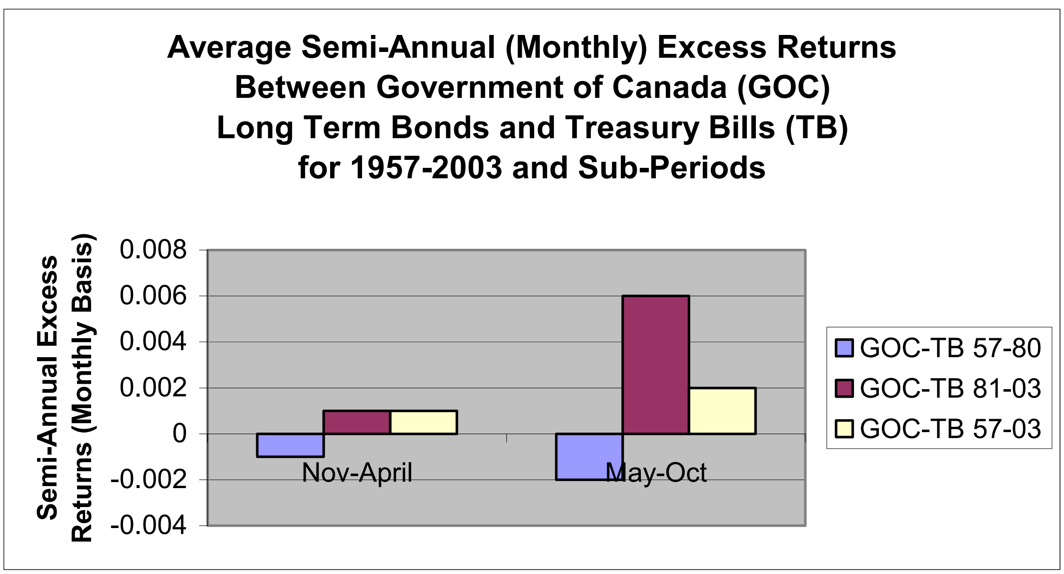
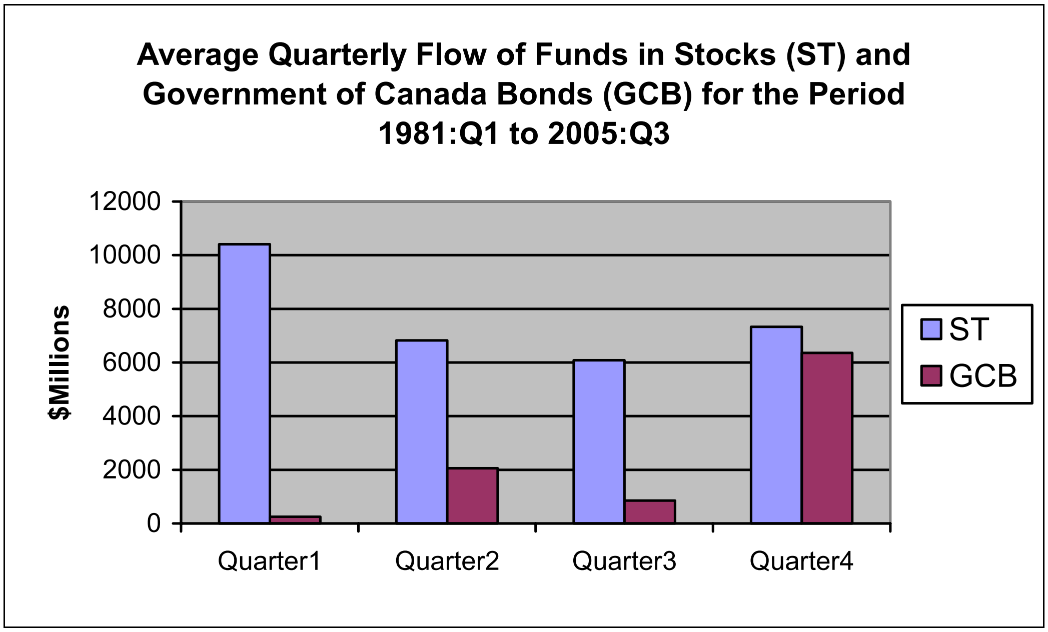


Figure 21


Average Quarterly Flow of Funds in Stocks (ST) and Government of Canada Bonds (GCB) for the Period 1981:Q1 to 2005:Q3
$Millions
12000
10000
8000
6000
4000
2000
0
Quarter1
Quarter2
Quarter3
Quarter4
ST
GCB

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