Impact of Inflation on Stock Market Performance – A Canadian Perspective

Research Proposal and Data Introduction

Tong Guan 1005687179

STA302H1F – Methods of Data Analysis

University of Toronto

Department of Statistics

Professor Katherine Daignault

Final Project Part 1

1. **Introduction and Research Question**

Inflation has been on the radar for most investors recently as numerous economic indicators are suggesting that inflation is not a mere transitory effect of reopening the economy, but it is here to stay (Auther, 2021). It is of great interest to investors, both retail and institutional, because a firm’s earnings may be adversely impacted by the increase in borrowing cost, a result of a contractionary monetary policy during high rates of inflation. Moreover, consumers will find it more expensive to borrow, especially if they have variable interest rate debt, experiencing a negative income effect leading to a decrease in aggregate spending. With less revenue, firms’ earnings will likely decrease, which reduces shareholder value. Furthermore, firms’ input costs will also be higher, along with the difficulty of passing the additional costs to consumers, firms’ earnings may take a substantial hit, decreasing shareholder value even further (Goedhart, Koller, and Wessels, 2018).

As an investor in both the Canadian and the US market myself, the relationship between inflation and stock market performance is naturally a topic that I am very interested in. Hence, I chose my research to answer the question “does high inflation lead to poor stock market performance?” Additionally, similar studies done in the past, as will be discussed in the following section, were mainly focused on the US stock market with data that does not cover the pandemic. I wish to extend the past studies further by exploring the relationship between inflation and stock market performance with the recent pandemic to gain a more up to date understanding, while also having a focus on the Canadian stock market.

1. **Literature Review**

Researching related studies on this topic using the University of Toronto’s online library yielded 266,249 articles and 63,051 reports related to this topic[[1]](#footnote-1). However, only a few is closely related to the proposed research question. One article suggests that, in general, a weak negative relationship between stock prices and inflation exists in the US (Valcarcel, 2011). Additionally, this relationship is also found to exist in multiple countries for the decade of the 1970’s (Cohn & Lessard, 1981). Notably, another study suggests the relationship between stock prices and inflation may differ depending on the measure of inflation (Oxman, 2012). Therefore, my analysis will take this finding into consideration by regressing stock market performance on different measures of inflation and comparing the results to gain a deeper understanding.

From the above literature review, there does not appear to be many studies on this specific research question. In addition, most studies in the field are either focused on the US market or lack a specific focus on the Canadian market. By answering my research question, I will attempt to fill in the gap of this potentially overlooked area by focusing on the Canadian stock market, introducing results that hopefully can be built upon by future studies.

1. **Data Source**

Data I am planning to include in this regression analysis includes CPI data with base year in 2005. In order to examine the possible difference in relationship between stock market performance and inflation across different measures of inflation (Oxman, 2012), I included 4 measures of CPI index – CPI Inflation, CPI-trim, CPI-median, CPI-common.

* CPI Inflation is the standard measure of consumer price index based on the basket of good set in the base year (Bank of Canada, n.d.), represented as INDINF\_CPI\_M in the dataset
* CPI-trim is the “measure of core inflation that excludes CPI components whose rates of change in a given month are located in the tails of the distribution of price changes” (Bank of Canada, n.d.), represented by INDINF\_CPI\_TRIM\_M
* CPI-median is the “measure of core inflation corresponding to the price change located at the 50th percentile (in terms of the CPI basket weights) of the distribution of price changes in a given month” (Bank of Canada, n.d.), represented by INDINF\_CPI\_MEDIAN\_M
* CPI-common is the “measure of core inflation that tracks common price changes across categories in the CPI basket. It uses a statistical procedure called a factor model to detect these common variations, which helps filter out price movements that might be caused by factors specific to certain components” (Bank of Canada, n.d.), represented by INDINF\_CPI\_COMMON\_M

Since I aim to focus the analysis on the Canadian stock market, stock market performance is therefore measured by the S&P/TSX Composite index, which is obtained from Yahoo Finance (Yahoo Finance, n.d.) and represented as “Close” in the data set. Because I am interested in the performance, rather than the overall market capitalization of the Canadian stock market, I have calculated the monthly change of the index to analyze the impact of inflation on the performance of the stock market, which is represented by “Monthly\_Change” in the data set.

To sum up, I will regress the Monthly Change of the S&P/TSX Composite Index on the Year-Over-Year inflation and comparing the relationship among inflations determined by different measurements of CPI.

1. **Exploratory Data Analysis**

***Figure 1***

Diagram, schematic

Description automatically generatedFrom Figure 1, we can see that the samples collected does not seem to present any significant skewness. Additionally, there seem to exist a weak negative correlation between inflation and stock market performance, in general, across four different measures of inflation. Therefore, it is appropriate to conduct our analysis using a linear regression model. This trend also aligns the prior result of a negative correlation between stock performance and inflation in the US (Valcarcel, 2011; Cohn & Lessard, 1981). Thus, the general trend exhibited by Figure 1 is reasonable. All variables also do not seem to present any high spreads, as measured by the standard deviation presented in Table 1. However, there does exist some outliers across the four measures of inflation as illustrated in Figure 1 which will be investigated in further analysis. Lastly, because the data set is merged from two different sources, I have cleaned the data set and have removed any rows that contains any missing values.

***Table 1 -- Summary Statistics***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | CPI Inflation[[2]](#footnote-2)\* | Mthly Change | CPI-Common Inflation | CPI Median Inflation | CPI-Trim Inflation |
| Obs | 341 | 341 | 341 | 341 | 341 |
| Median | 1.8 | 0.01 | 1.7 | 1.8 | 1.8 |
| Mean | 1.77 | 0.01 | 1.75 | 1.79 | 1.74 |
| Sd | 0.89 | 0.04 | 0.34 | 0.36 | 0.42 |

Because there are many variables that can potentially influence stock market performance in addition to inflation, like market volatility, central bank’s signal on inflation, etc., I will be aiming for a model with multiple predictors. These additional predictors will help reduce the omitted variable bias, which hopefully can result in a clearer and more precise relationship between inflation and stock market performance. Furthermore, this would also allow the model to be used for predictions, which can provide further guidance to investors for making investment decisions.

**References**

Auther, J. (2021, October 19). *Inflation Isn’t Transitory. So Now What?: Authers’ Indicators*. Bloomberg.com. Retrieved October 20, 2021, from https://www.bloomberg.com/graphics/opinion-authers-inflation-tracker/.

Cohn, R. A., & Lessard, D. R. (1981). The effect of inflation on stock prices: International evidence. *The Journal of Finance*, *36*(2), 277–289. https://doi.org/10.1111/j.1540-6261.1981.tb00440.x

Goedhart, M., Koller, T. M., & Wessels, D. (2018, February 9). *How inflation can destroy shareholder value*. McKinsey & Company. Retrieved October 20, 2021, from https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-inflation-can-destroy-shareholder-value.

*Inflation: Definitions, graphs and data*[[3]](#footnote-3). Bank of Canada. (n.d.). Retrieved October 21, 2021, from https://www.bankofcanada.ca/rates/indicators/capacity-and-inflation-pressures/inflation/.

Oxman, J. (2012). Price inflation and stock returns. *Economics Letters*, *116*(3), 385–388. https://doi.org/10.1016/j.econlet.2012.04.024

Valcarcel, V. J. (2012). The dynamic adjustments of stock prices to inflation disturbances. *Journal of Economics and Business*, *64*(2), 117–144. https://doi.org/10.1016/j.jeconbus.2011.11.002

Yahoo! (n.d.). Yahoo! Finance. Retrieved October 20, 2021, from https://finance.yahoo.com/.

1. As of October 20, 2021, with search term “inflation and stock prices.” Relevance determined by University of Toronto’s online library search service [↑](#footnote-ref-1)
2. \* All inflation are measured in percentage [↑](#footnote-ref-2)
3. CPI data used in this proposal is owned and collected by the Bank of Canada. This data is permitted for free use, copy, distribute and transmit under the terms outlined in section 1 and 2 of the *Terms of User and Disclaimers*. Changes were made to the organization of the data obtained that does not alter the original values. This is a required attribution to the Bank of Canada. [↑](#footnote-ref-3)