

# The relationship between Inflation rate and Interest rate, and it can influence Stock and Cryptocurrency Market\*

Market factors can be affected by Inflation rate and Interest rate changes

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This paper explores the correlation between inflation rate and interest rate since both of them increased significantly last few years and the both rates are the important factors of the global economy. Additionally, In the past few years, many stock items and cryptocurrencies fluctuated wildly. This research studies the correlation between the inflation rate and interest rate, and how the two important factors in economy impact to the stock and cryptocurrency market. Overall, the inflation rate and interest rate can be considered for future market trends.

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\*Code and data are available at: [https://github.com/kakaomonk/inflation\\_interest\\_rate\\_and\\_market\\_trends](https://github.com/kakaomonk/inflation_interest_rate_and_market_trends)

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# 1 Introduction

Throughout last few years, the inflation rate and the interest rate have been increased rampantly after pandemic, and every government tried to control the inflation rate and interest rate, but it requires a long duration to stabilize the inflation rate and interest rate since those are related to almost all factors in economy. According to... (**citezzzzzz?**), stabilizing the rate would take for a while.

In this paper

You can and should cross-reference sections and sub-sections. We use R Core Team (2023) and Wickham et al. (2019).

The remainder of this paper is structured as follows. Section [2](#)....

# 2 Data

The major 4 data sets in this research are “historical inflation rate in Canada”(Canada, n.d.), “historical interest rate in Canada”(n.d.a), “historical NASDAQ index price”(n.d.b), and “historical Bitcoin price”(n.d.c). The raw historical inflation data contains quarterly inflation rate in Canada last 10 years. The raw historical interest rate contains montly interest rate in Canada last 10 years. In case of the data sets contain NASDAQ index and Bitcoin price contain monthly price data of each index.

The raw data sets were cleaned with R(R Core Team 2023), Tidyverse(**citeTidyverse?**),

## 2.1 Data Cleaning

The

## 2.2

The interest variables in this study

Some of our data is of penguins (**?@fig-bills**), from Horst, Hill, and Gorman (2020).

Talk more about it.

And also planes (**?@fig-planes**). (You can change the height and width, but don't worry about doing that until you have finished every other aspect of the paper - Quarto will try to make it look nice and the defaults usually work well once you have enough text.)

Talk way more about it.

## 3 Model

The goal of our modelling strategy is twofold. Firstly,...

Here we briefly describe the Bayesian analysis model used to investigate... Background details and diagnostics are included in Appendix [B](#).

### 3.1 Model set-up

Define  $y_i$  as the number of seconds that the plane remained aloft. Then  $\beta_i$  is the wing width and  $\gamma_i$  is the wing length, both measured in millimeters.

$$y_i | \mu_i, \sigma \sim \text{Normal}(\mu_i, \sigma) \tag{1}$$

$$\mu_i = \alpha + \beta_i + \gamma_i \tag{2}$$

$$\alpha \sim \text{Normal}(0, 2.5) \tag{3}$$

$$\beta \sim \text{Normal}(0, 2.5) \tag{4}$$

$$\gamma \sim \text{Normal}(0, 2.5) \tag{5}$$

$$\sigma \sim \text{Exponential}(1) \tag{6}$$

We run the model in R (R Core Team 2023) using the **rstanarm** package of Goodrich et al. (2022). We use the default priors from **rstanarm**.

Table 1: Explanatory models of flight time based on wing width and wing length

### **3.1.1 Model justification**

We expect a positive relationship between the size of the wings and time spent aloft. In particular...

We can use maths by including latex between dollar signs, for instance  $\theta$ .

## **4 Results**

Our results are summarized in Table [1](#).

## **5 Discussion**

### **5.1 First discussion point**

If my paper were 10 pages, then should be at least 2.5 pages. The discussion is a chance to show off what you know and what you learnt from all this.

### **5.2 Second discussion point**

### **5.3 Third discussion point**

### **5.4 Weaknesses and next steps**

Weaknesses and next steps should also be included.

## Appendix

### A Additional data details

### B Model details

#### B.1 Posterior predictive check

In `?@fig-ppcheckandposteriorvsprior-1` we implement a posterior predictive check. This shows...

In `?@fig-ppcheckandposteriorvsprior-2` we compare the posterior with the prior. This shows...

Examining how the model fits, and is affected  
by, the data

#### B.2 Diagnostics

`?@fig-stanareyouokay-1` is a trace plot. It shows... This suggests...

`?@fig-stanareyouokay-2` is a Rhat plot. It shows... This suggests...

Checking the convergence of the MCMC algo-  
rithm

## References

n.d.a.

n.d.c.

n.d.b.

Canada, Bank of. n.d. “Inflation: Definitions, Graphs and Data.” <https://www.bankofcanada.ca/rates/indicators/capacity-and-inflation-pressure/inflation/>.

Goodrich, Ben, Jonah Gabry, Imad Ali, and Sam Brilleman. 2022. “Rstanarm: Bayesian Applied Regression Modeling via Stan.” <https://mc-stan.org/rstanarm/>.

Horst, Allison Marie, Alison Presmanes Hill, and Kristen B Gorman. 2020. *Palmerpenguins: Palmer Archipelago (Antarctica) Penguin Data*. <https://doi.org/10.5281/zenodo.3960218>.

R Core Team. 2023. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. <https://www.R-project.org/>.

Wickham, Hadley, Mara Averick, Jennifer Bryan, Winston Chang, Lucy D’Agostino McGowan, Romain François, Garrett Golemund, et al. 2019. “Welcome to the tidyverse.” *Journal of Open Source Software* 4 (43): 1686. <https://doi.org/10.21105/joss.01686>.