

# Air Freight in the Pandemic

How does Covid control policies impact air freight price index?

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# Description of the topic

## Air freight price index in the pandemic

- As a significant part of supply chain, air freight covers a wide spectrum of products from petroleum, electrical equipment to food.
- Air freight price index surges in the early stage of the pandemic.
- Covid control policies have different impacts on air freight price in different countries.
- The impacts are also heterogeneous among different categories.

# Literature review

- Covid-19 disrupts supply chain from credit risks (Agca et al., 2020), labor demand (Fang et al., 2020) to retailing (Hwang et al., 2020).
- The mechanism of Covid-19 disruption is empirically evaluated by DiD (Hwang et al., 2020) and fixed-effects regression with network variables (Agca et al., 2020).
- Scholars also focus on risks of air freight and transportation in the pandemic including grounded flights, border controls and operational costs (Swegal and Wiesner, 2021; Suau-Sanchez et al., 2020; Meng et al., 2021; Gudmundsson et al., 2021).

# Research questions

- How do Covid-related control policies impact inbound air freight price index?
- How do the impacts differ among different countries?
- What is the heterogeneity of effects among different categories?

# Research methods

Mixed-effects regression models:

$$PI_{i,t} = b_{0,i} + b_{1,i} \times R.E_{i,t} + b_2 \times F.E_{i,t} + C_{i,t} + \varepsilon_{i,t}$$

$$b_{0,i} = \beta_0 + v_{0,i}$$

$$b_{1,i} = \beta_1 + v_{1,i}$$

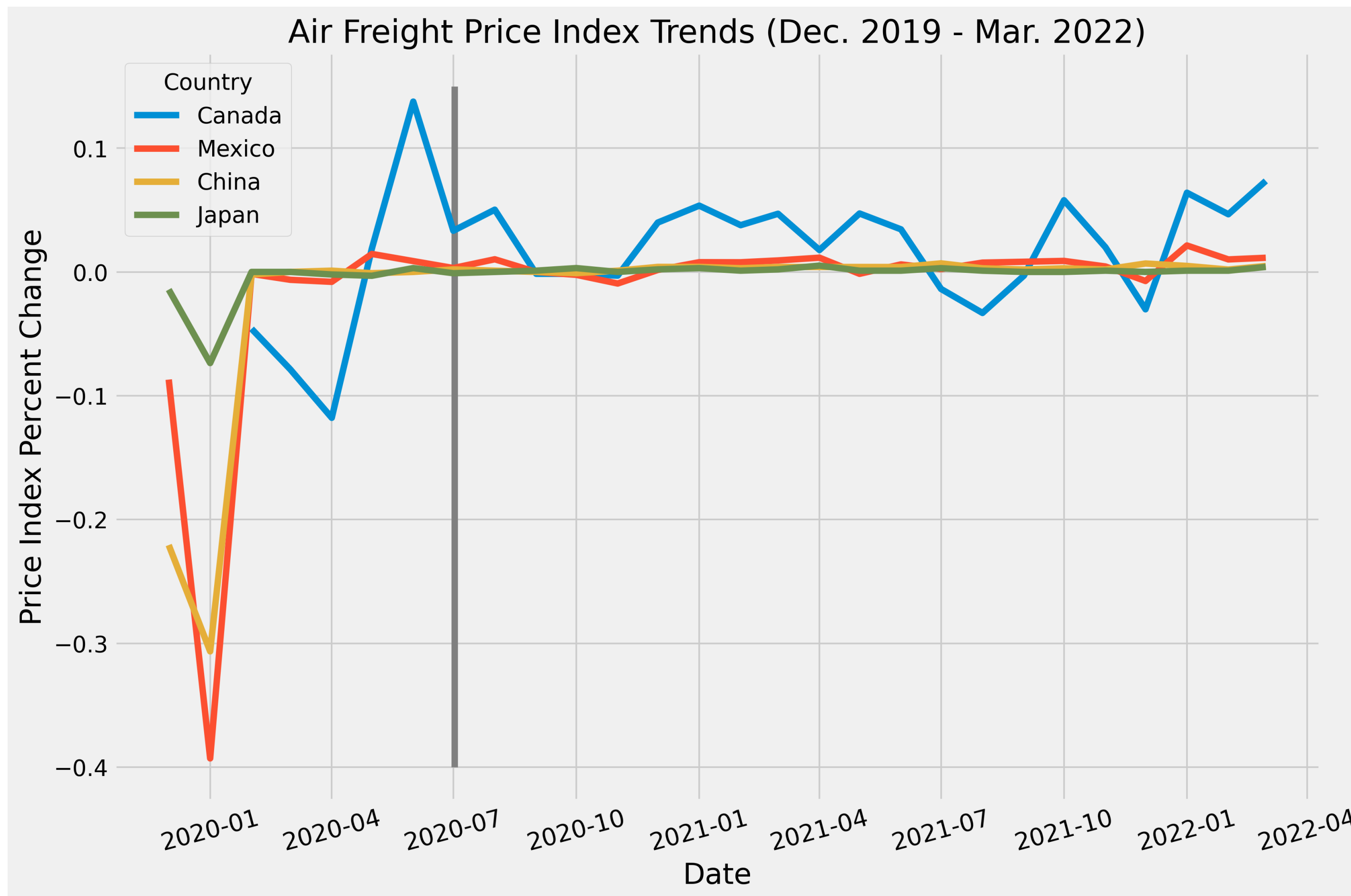
# Data

## Air freight price index data by Bureau of Labor Statistics

- It measures changes in rates for air transportation of freight.
- It aggregates airport to airport prices and weighs based on DoT International market trade value data.
- 28 months from December 2019 to March 2022.
- 4 trading partners included — Canada, Mexico, China, Japan.

# Data

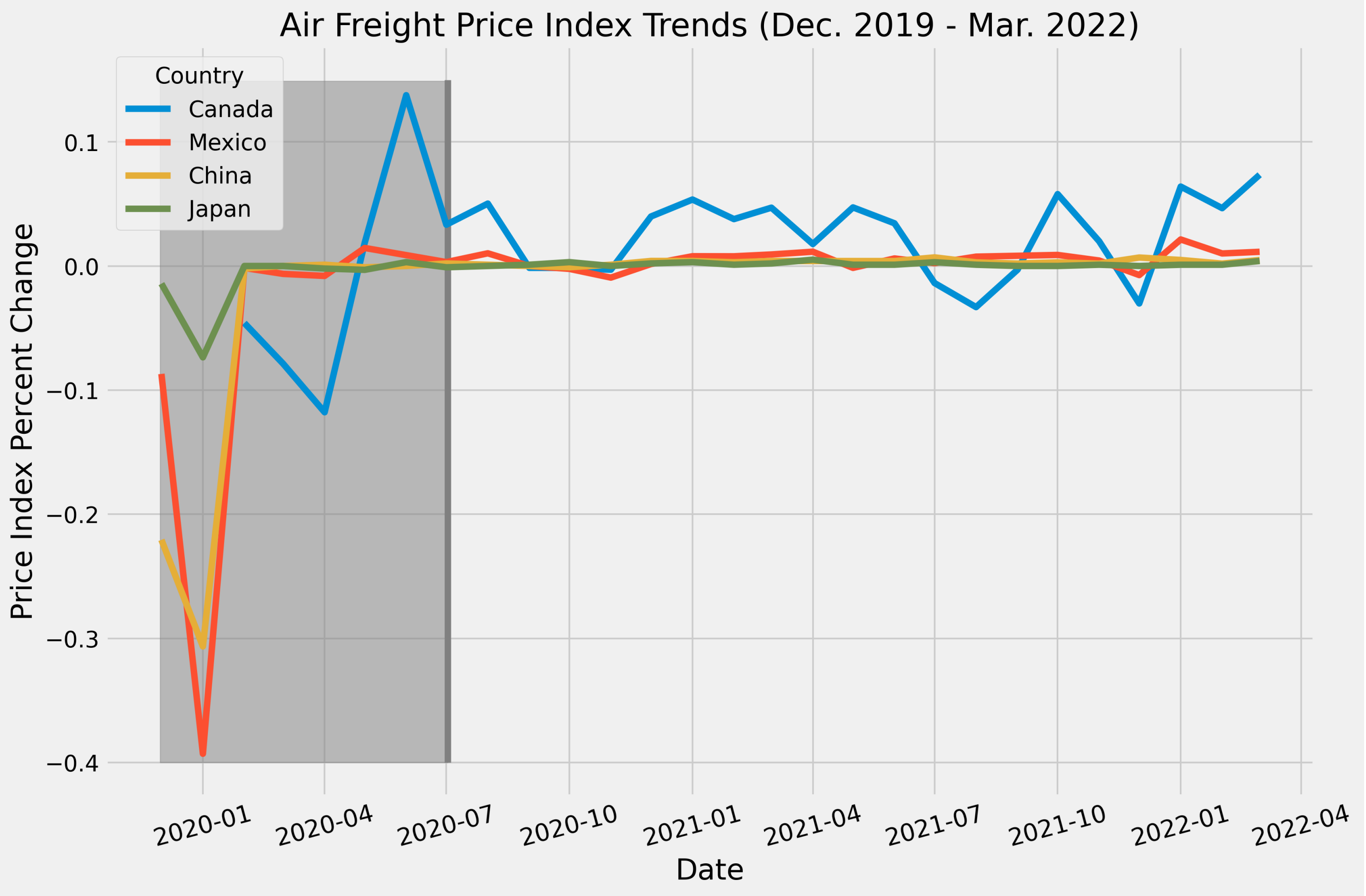
## Air freight price index



Trends fluctuated dramatically for all countries before July 2020.

# Data

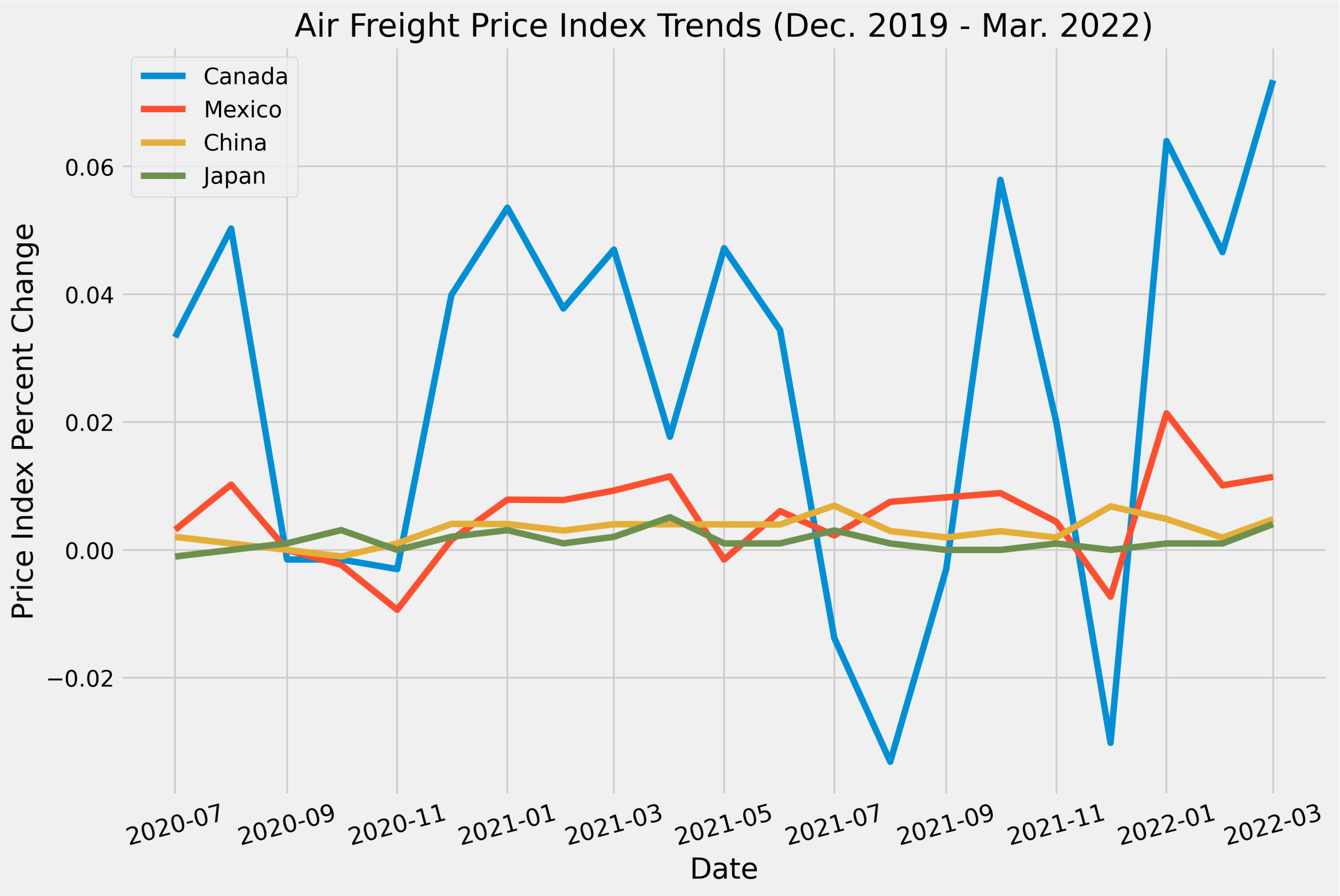
## Air freight price index





# Data

## Air freight price index



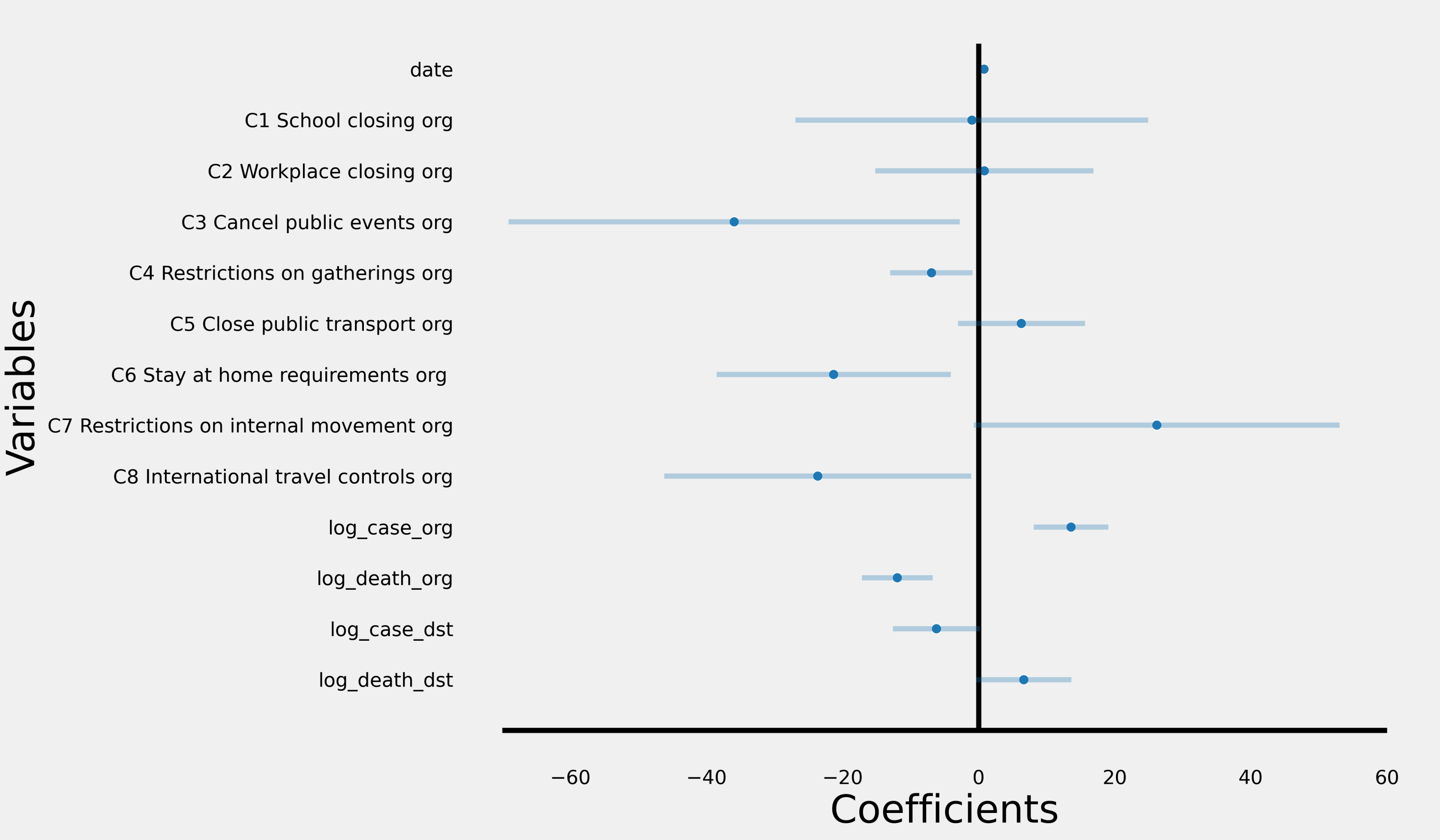
# Data

## **Covid control policy data**

- Published by Oxford Covid-19 Government Response Tracker project;
- Including a diversity of policy types from workplace closing to International travel controls;
- Time ranges from December 2019 to March 2022 for all four trading partners.

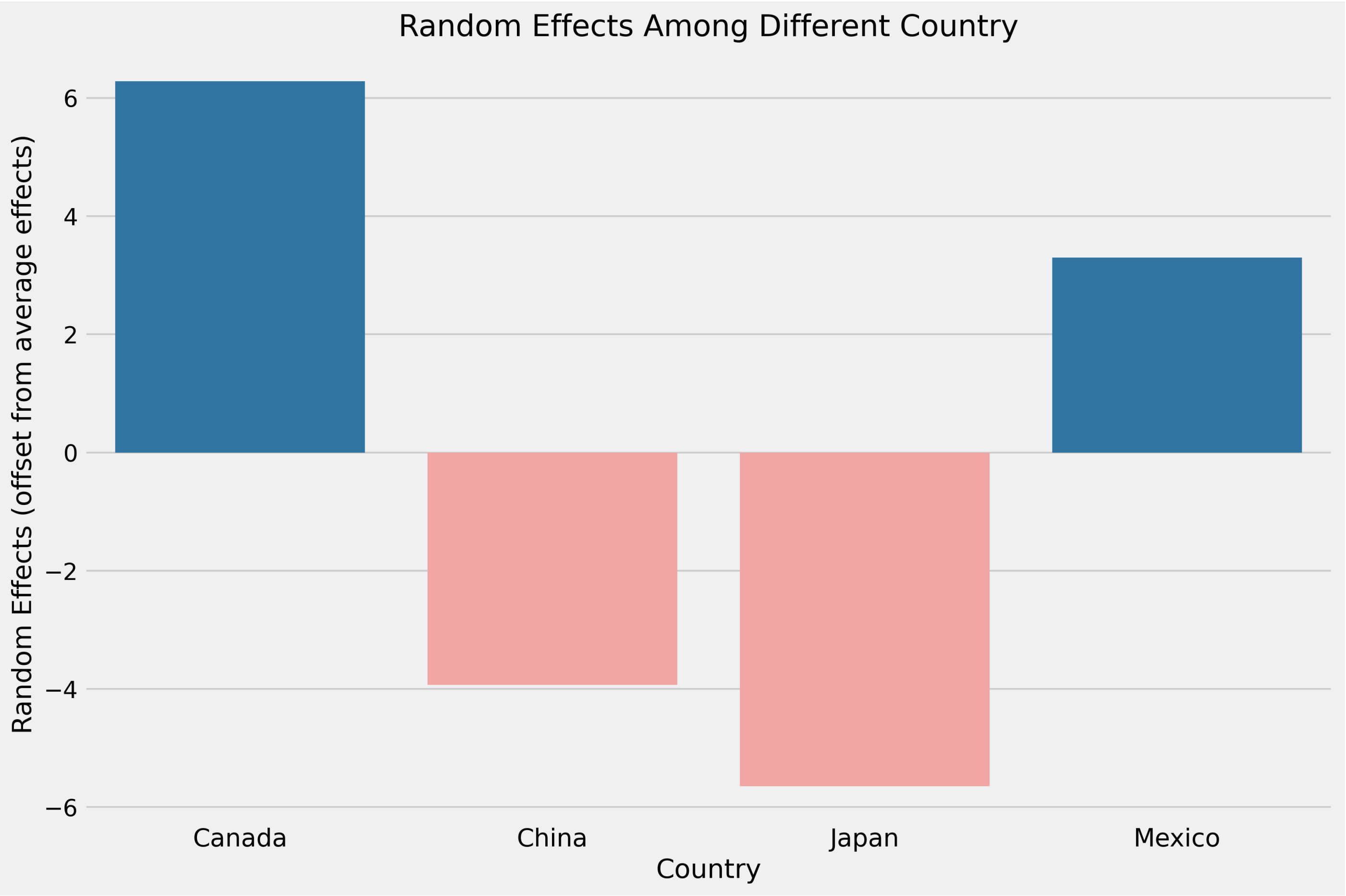
# Findings

## Impact of Covid-related policies on inbound air freight price index



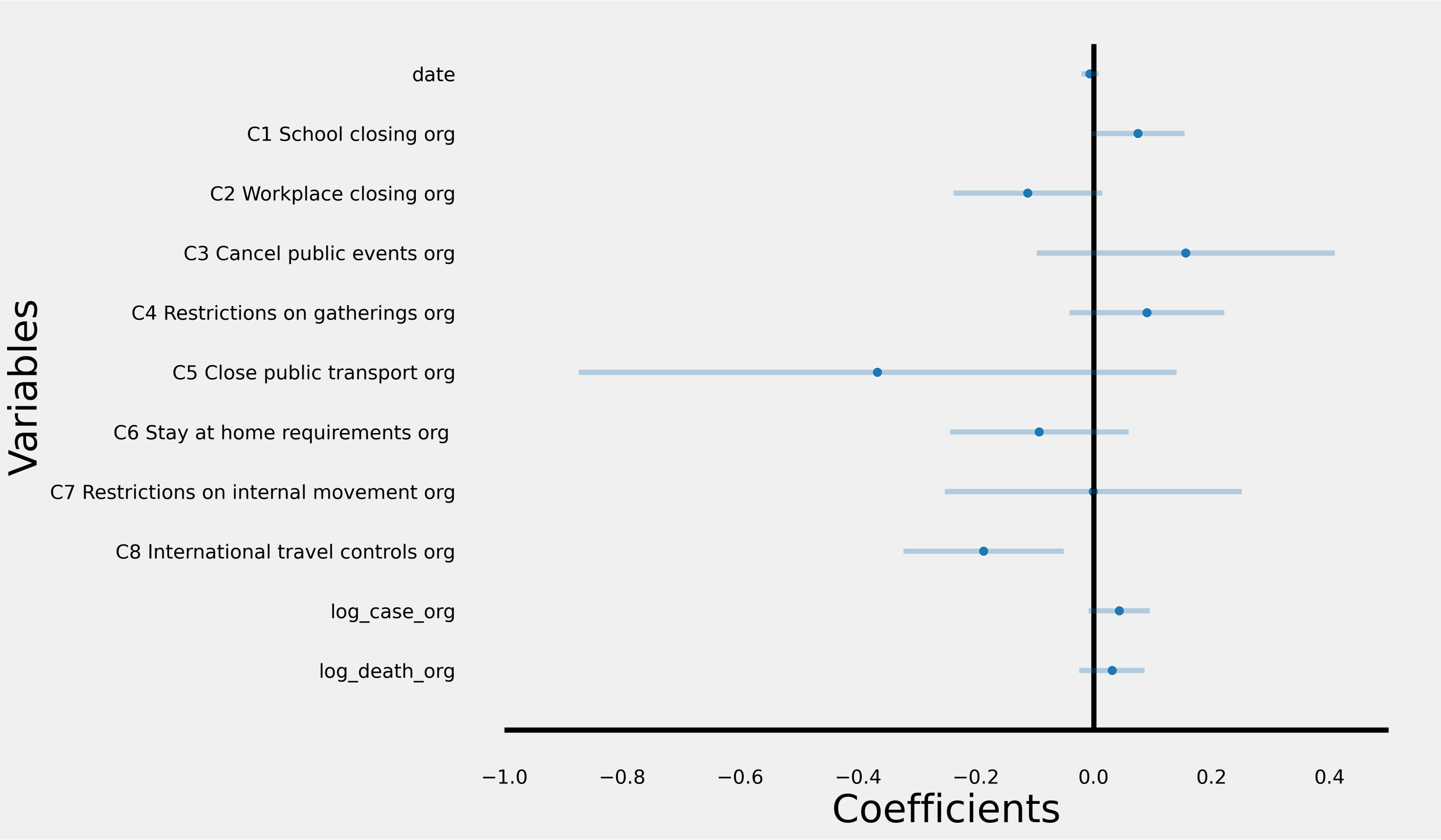
# Findings

## Heterogeneity among countries



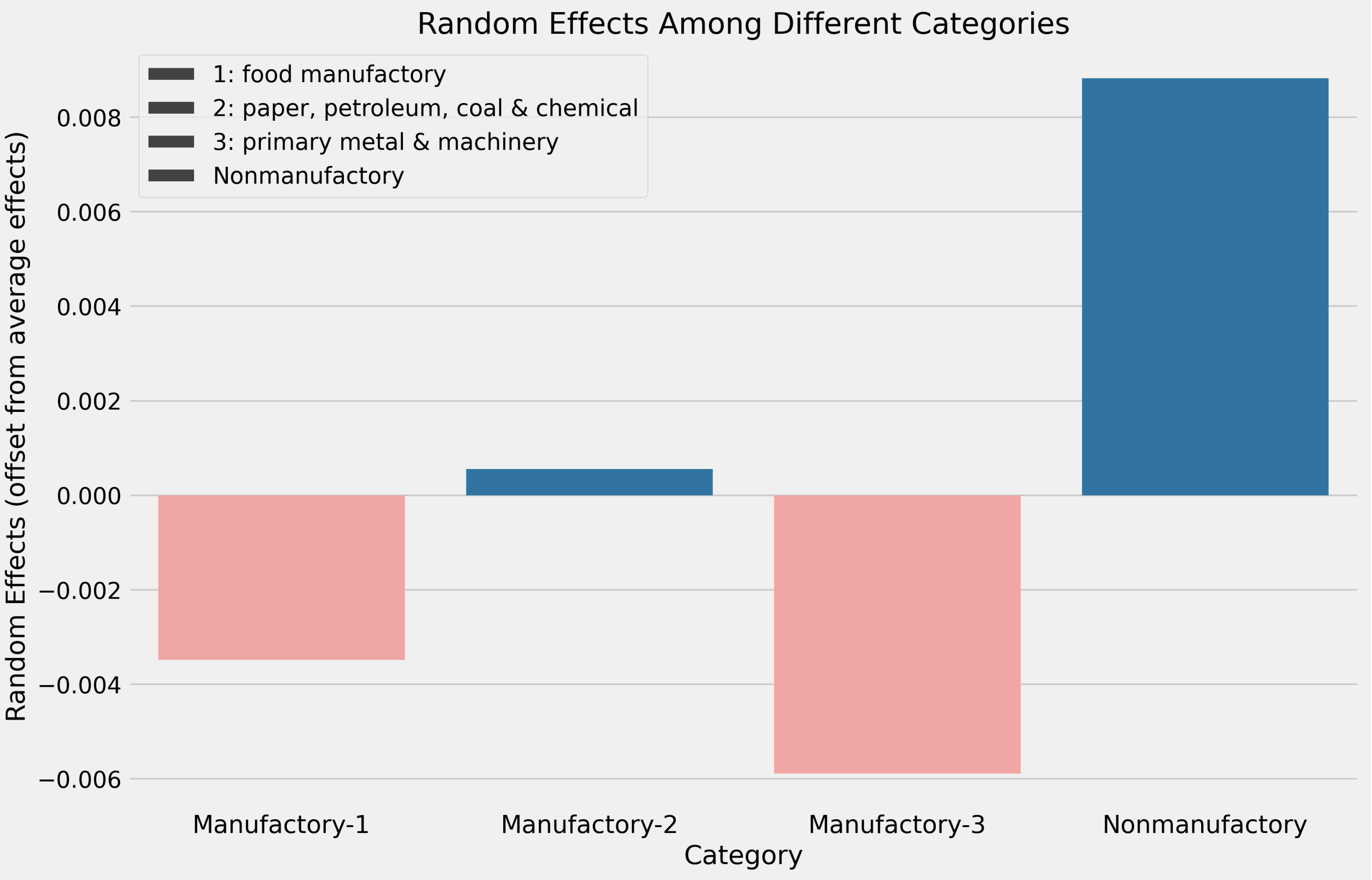
# Findings

## Impact of Covid-related policies on inbound air freight price index from Canada



# Findings

## Heterogeneity among categories of Canada



# Discussion

- Air freight with distant partners is more heavily impacted.
- Categories with more backup shipping options are more heavily impacted.
- Need more granular data for more accurate analysis:
  - Policies from different states within a country are not equal.
  - EU countries and UK are not discussed in this work.

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