The Economic Implications of COVID-19 Lockdowns

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Introduction

Background & Motivation

Government policies including **lockdowns** often receive the blame for the economic externalities of COVID-19

COVID-19 has created vastly different international outcomes and elicited disparate policy responses

However, agnostic of policy, COVID-19 creates economic harm through **decreased** **productivity** and **consumer confidence**

We sought to situate ourselves in this **debate** and understand how policies impact **economic variance** for nation-states.

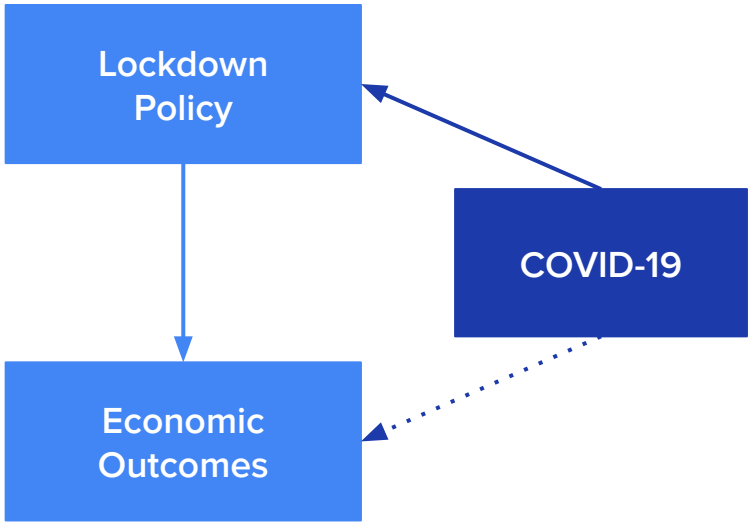
Q1 What are the effects of increasing lockdown severity on economic outcomes and how has this relationship varied by nation-state?

Q2 How is the impact of COVID-19 on global economies mitigated or enhanced by lockdowns?

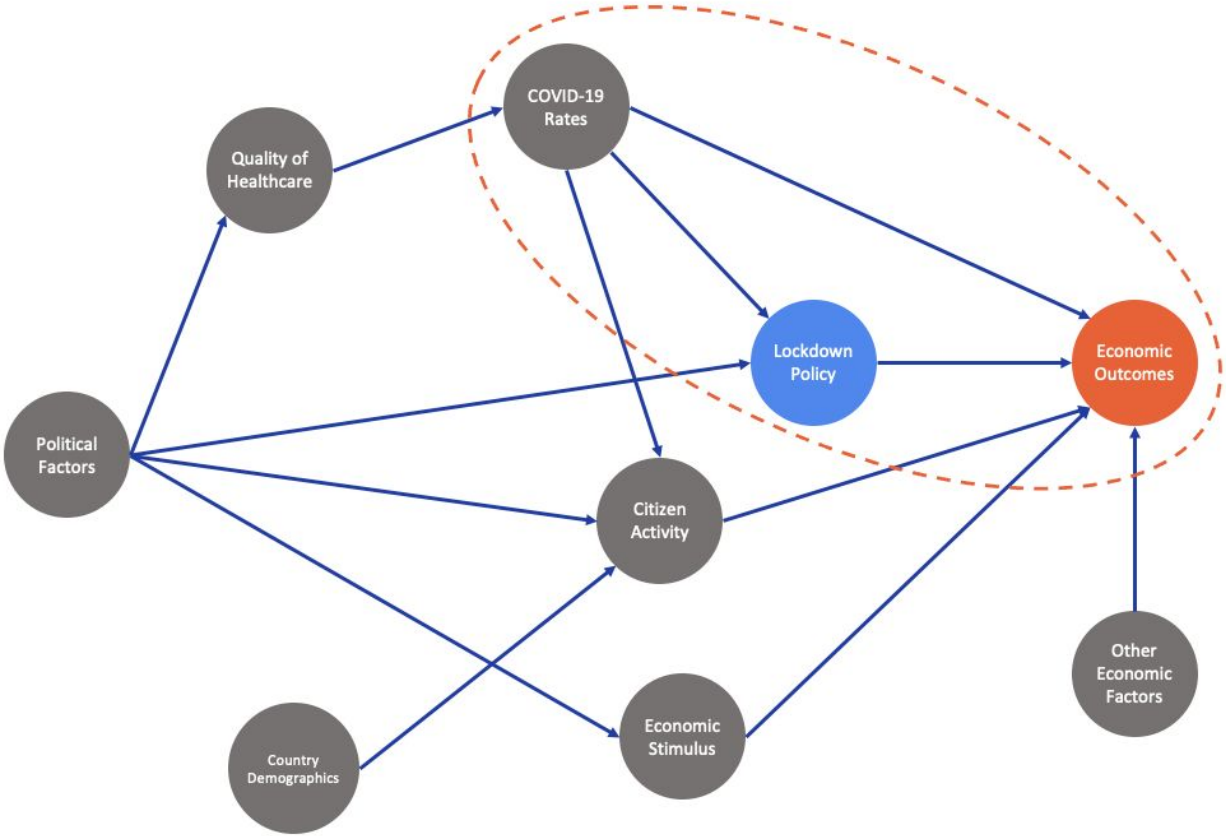
Theory

H1: Increasing lockdown severity improves economic outcomes

H2: Lockdown severity significantly mediates the relationship between COVID-19 and economic outcomes



Path Model


COVID-19 Rates
Quality of Healthcare
Lockdown Policy
Economic Outcomes
Political Factors
Citizen Activity
Other Economic Factors
Economic Stimulus
Country Demographics

Literature Review

- *Mandel and Veetil (2020)*
  - Lockdowns decrease domestic economic output
- *Coibion et al. (2020)*
  - Lockdowns decrease U.S. employment and consumer spending
- *Narayan et al. (2020)*
  - Lockdown policy increases G7 country stock returns

Limitations

Model-based

Short-term

Dummy variables

Limited scope

Data & Methods

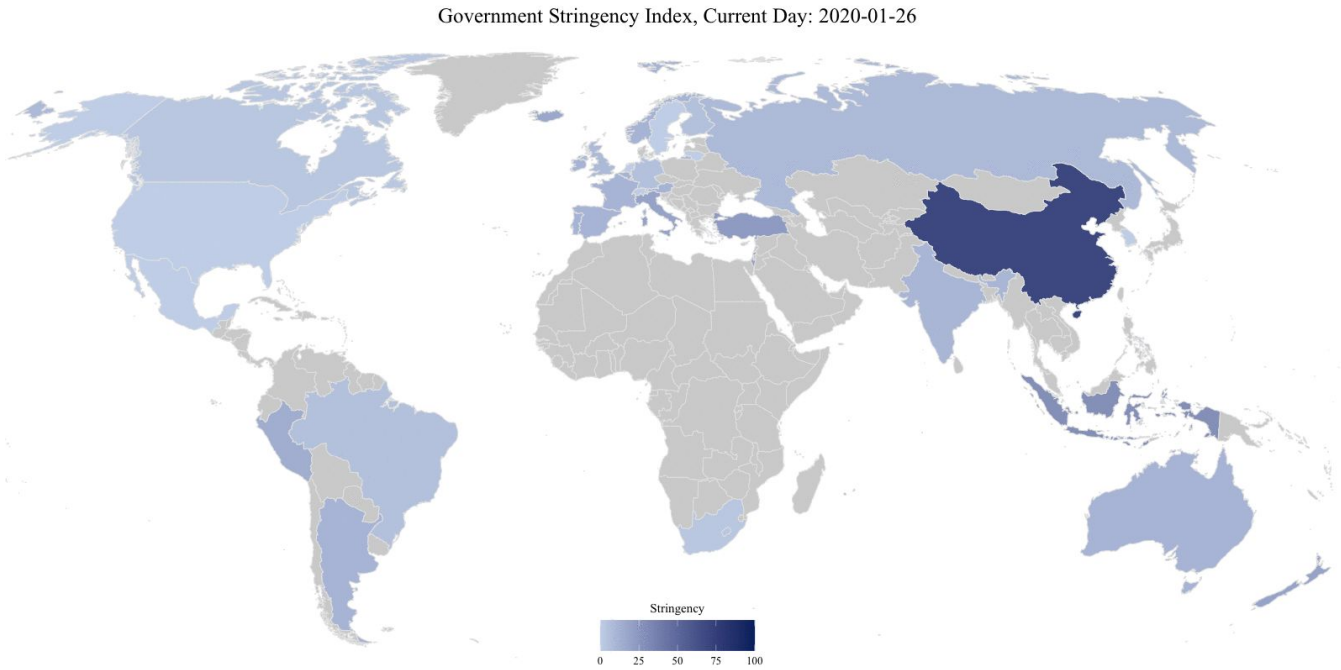
Independent Variable: Lockdown Severity

Government Stringency Index

Scale: 0-100

Nine Metrics

Source: Oxford COVID-19 Government Response Tracker



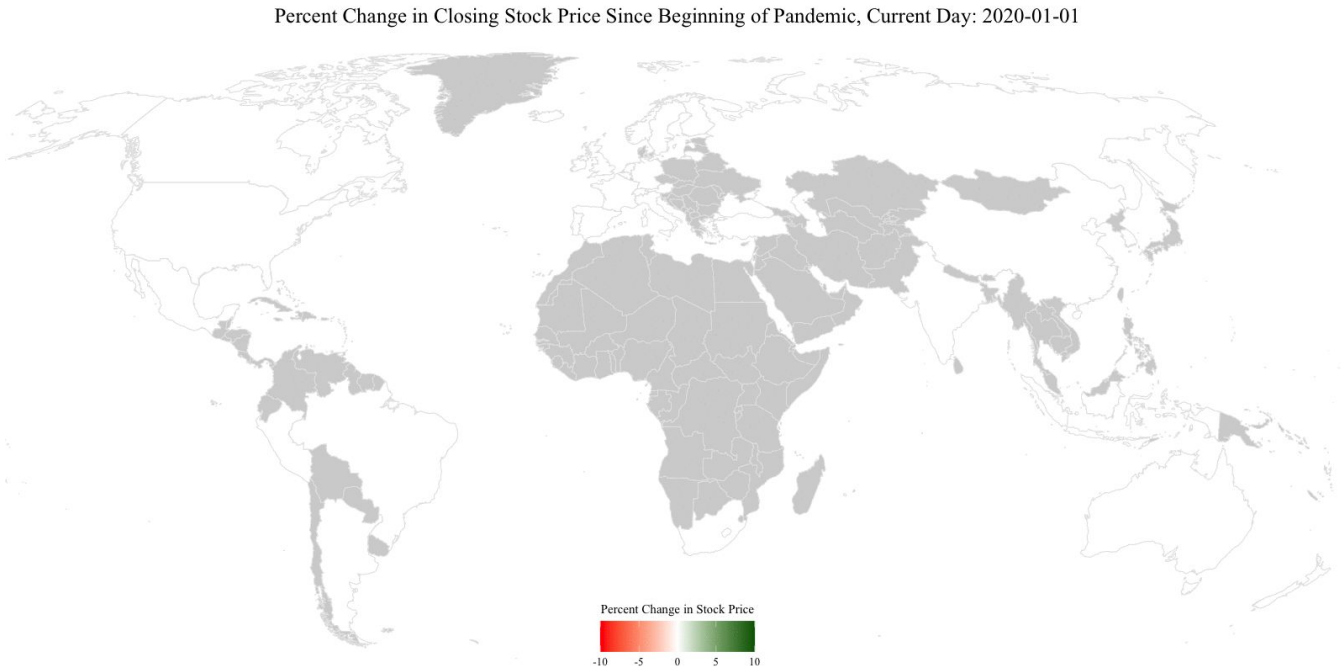
Dependent Variable: Economic Health

Stock Returns

Primary Nation-State Stock Index

Daily Close Price

Source: Yahoo Finance



Data - Additional Variables

COVID

New Cases (Smoothed)

Citizen Activity

Google Trends Mobility

Economic Factors

Oil Prices, Sectoral Composition

Political Factors

Polity Score & Fractionalization Index

Healthcare Quality

Hospital Beds Per Thousand

Economic Stimulus

Stimulus Spending (% of GDP)

Country Demographics

Human Development Index & Urban Population

Sources: *OECD, IMF, Google, CSSE, Our World In Data, DPI*

Methods - Time-Series Considerations

Issue	Solution	Equation
Delayed Effects of Independent Variable	7-Day ***Rolling Average*** of Lockdown Severity	$LOCKAVG_{ct} = \frac{1}{7}\sum_{i=1}^{7} LOCK_{c(t-i)}$
Dependent Variable Autocorrelation	***Percent Change*** of Stock Prices	$STOCKPC_{ct} = \frac{STOCK_{ct} - STOCK_{c(t-1)}}{STOCK_{c(t-1)}}$

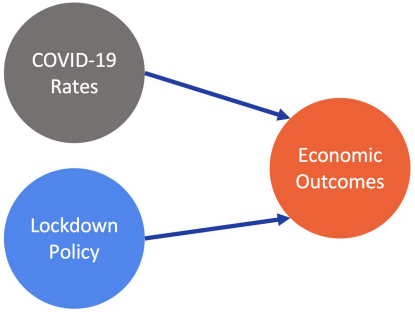
c = country *t = date*

Methods - OLS Regression

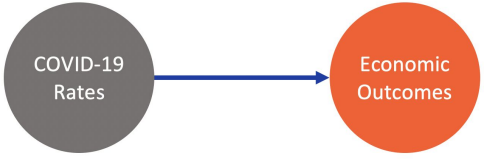
$$STOCKPC_{ct} = \beta_0 + \boldsymbol{\beta_1} LOCKAVG_{ct} + controls_{ct} + \varepsilon_{ct}$$

Percent Change in Stock Price	*Coefficient of Interest*	*Rolling Average of Lockdown Severity*	*Controlling Variables*	*Error Term*

Methods - Mediation Analysis



$$STOCKPC_{ct} = \beta_0 + \beta_1 COVIDRATE_{ct} + \beta_2 LOCKAVG_{ct} + controls_{ct} + \varepsilon_{ct}$$



$$STOCKPC_{ct} = \beta_0 + \beta_3 COVIDRATE_{ct} + controls_{ct} + \varepsilon_{ct}$$

$$\beta_{indirect} = \beta_3 - \beta_1$$

Results

OLS Regression

Lockdown Severity	+	Oil Price	+
Service Sector Share of GDP	-	Hospital Beds per 1000 Citizens	+
Polity Index	-	New Cases	+
Fractionalization Index	+	Travel to Retail and Recreation	+
Human Development Index	+	Stimulus Spending as % of GDP	+
Movement in Residential Areas	+	% of Population in Urban Areas	-

+/- indicates positive/negative relation to dependent variable

*Statistically significant

OLS Regression

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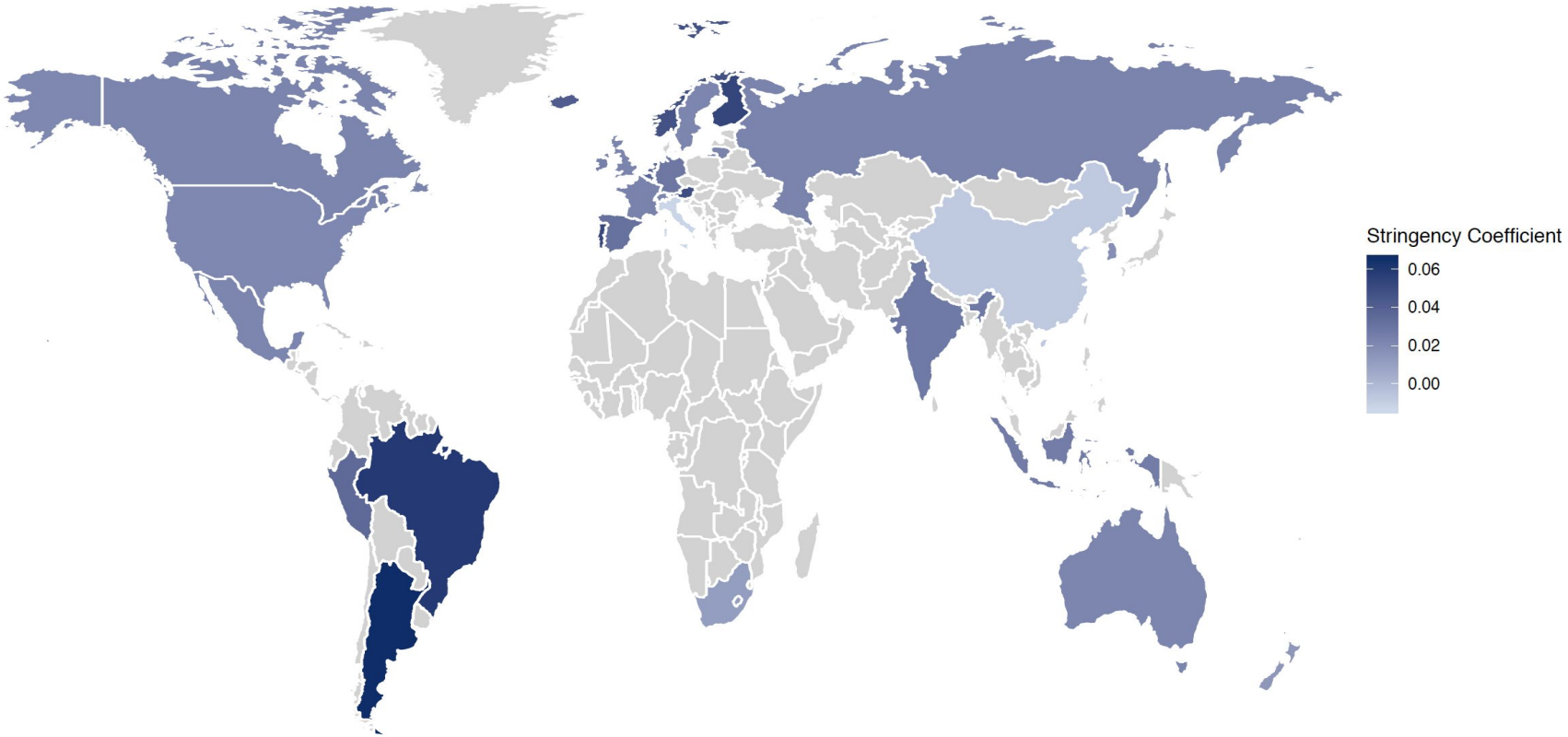
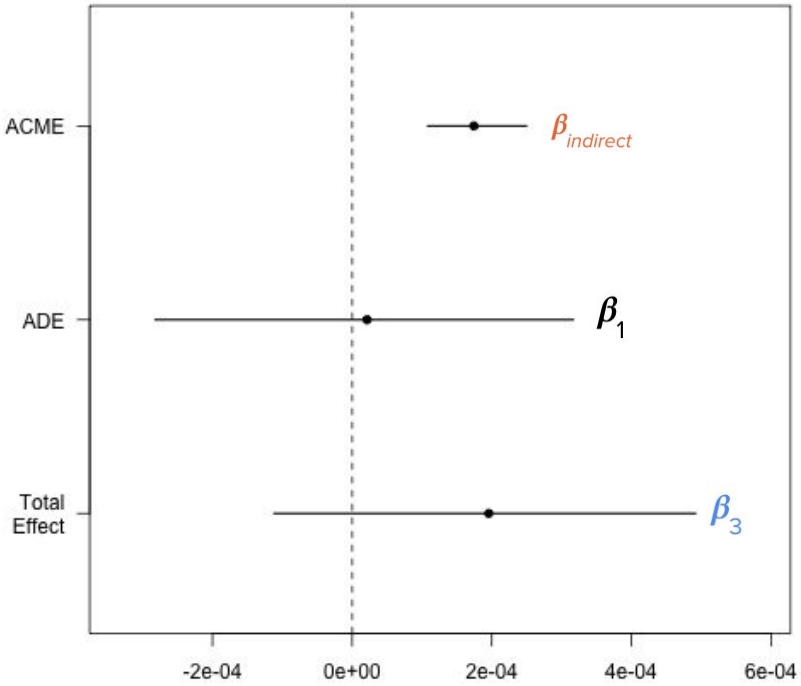
OLS Regression by Country

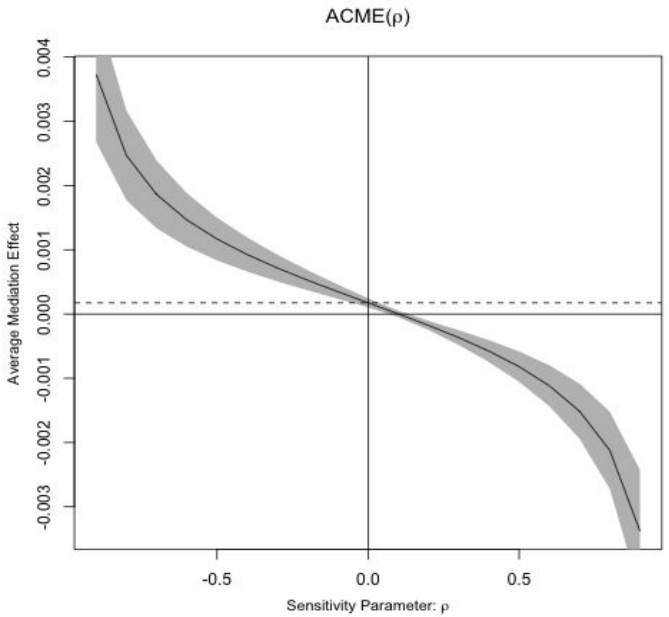


Mediation Analysis

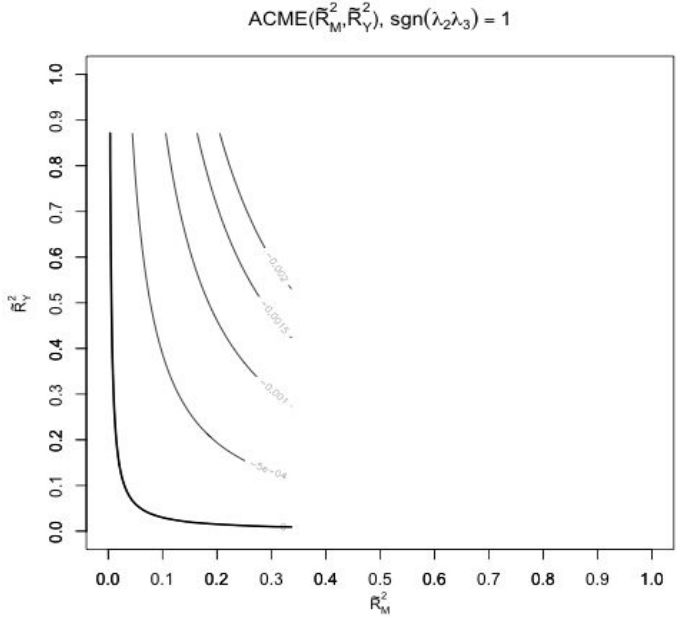


- Total Effect is β_3 - the total effect of COVID-19 rates on stock outcomes without accounting for lockdown policy
- Average Direct Effect (ADE) is β_1 - the direct effect of COVID-19 rates on stock outcomes when taking into account lockdown policy
- Average Causal Mediation Effect (ACME) is $\beta_{indirect}$ and it is **statistically significant**
- 89.10% of the effect of COVID-19 rates on stock outcomes is mediated by lockdown policy

Mediation Analysis Cont.



Estimates ACME to be 0 when ρ > .15, indicating reasonable robustness



Estimates ACME to be 0 if confounder explains 5% of variance in both lockdown stringency and stock returns

Conclusion

Our Results Suggest...

Q1

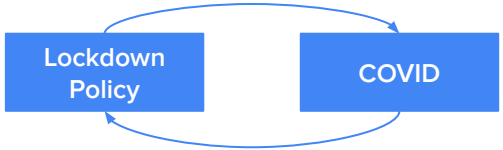
Increasing lockdown severity has a **slight positive effect** on changes in stock prices and is **mostly consistent** across nation-states

Q2

Lockdowns **significantly mediate** the impact of COVID-19 on national economies

Limitations

- Feedback relationships



- “Imperfect” Variables
  - Mobility ≠ Compliance
  - Stock Market ≠ Economy

- Limited Scope
- Long-Term Effects
- Intra-National Variation
- Single Lockdown Index

Questions?