EE406
Assignment 4

Impact Analysis of COVID19 using Alternative Indicators

Introduction

- COVID-19 was reported in Thailand on **13 January 2020**, when the country **verified a case** that originated in the PRC.
- **Local transmission** was first confirmed on **31 January 2020** by the MOPH.
- This was the **first reported case** in the country with no record of travel to the PRC.
- 23 New cases increased rapidly in **March**, with more than **100 cases reported daily**.
- The source of many of these infections was presumed to have been **boxing stadiums** and **entertainment venues**.
- In late February, 2 weeks before the WHO declared COVID-19 a pandemic, Thailand had declared the disease dangerous and communicable under the **Disease Control Act** in order to **intensify surveillance** and **containment efforts.**

Source: https://www.adb.org/publications/pandemic-preparedness-covid-19-lessons

Introduction (cont'd)

Economic impacts of COVID19

- In 2020, the COVID-19 pandemic struck Thailand and the economic impact has been severe, leading to **widespread job losses**, affecting **middle-class households** and **the poor** alike, and threatening hard-won gains in poverty reduction.
- As COVID-19 struck the economy, **poverty rose to 6.4%** in 2020, representing an **additional 200,000 people** falling into **poverty**.
- The pace of **poverty reduction** had already **slowed in recent years** after it had declined substantially over the **past three decades**, from **65.2%** in **1988** to **6.2%** in **2019**.

Source: https://www.worldbank.org/en/country/thailand/overview#1

Introduction (cont'd)

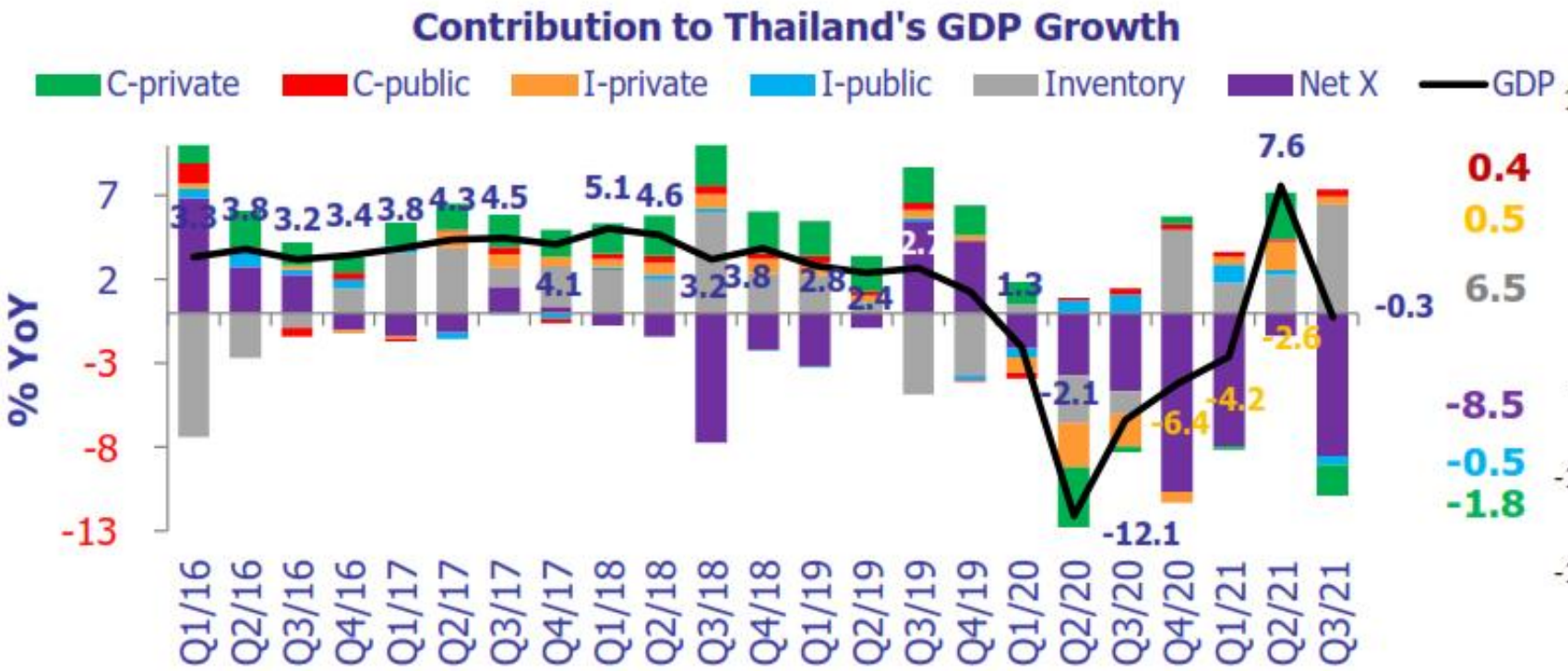
Economic impacts of COVID19 (cont'd)

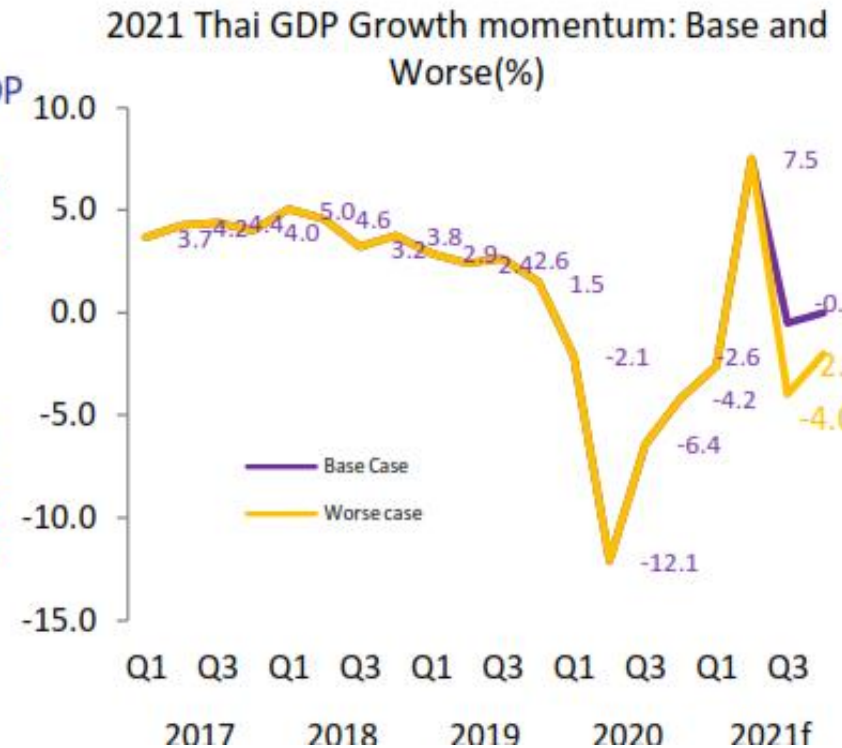
- **Economic growth** in Thailand **contracted by 6.1**% in **2020** due to a decline in external demand affecting trade and **tourism**, **supply chain disruptions**, and weakening **domestic consumption**.
- After suffering its worst contraction since the Asian financial crisis in 2020, the **economy expanded** by **2%** in the **first half of 2021** amid the third wave of the COVID-19 pandemic and is **not expected** to **recover** to **pre-COVID-19 levels** until **2023**.
- The primary impact has been a spike in **unemployment rate**.
- By the **first quarter** of **2021**, there were **710,000 fewer jobs** compared to the previous year.

Source: https://www.worldbank.org/en/country/thailand/overview#1

Introduction (cont'd)

Economic impacts of COVID19 (cont'd)





Source: SCB Securities

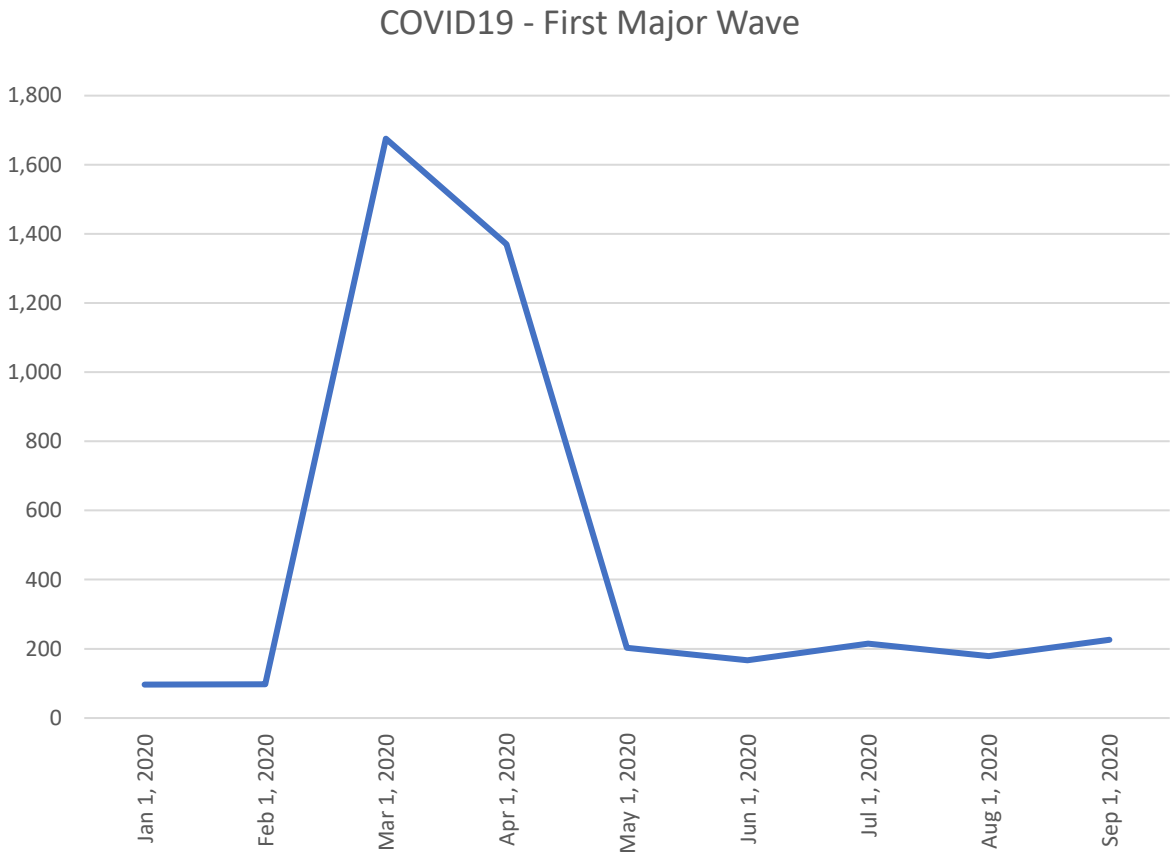
Introduction (cont'd)

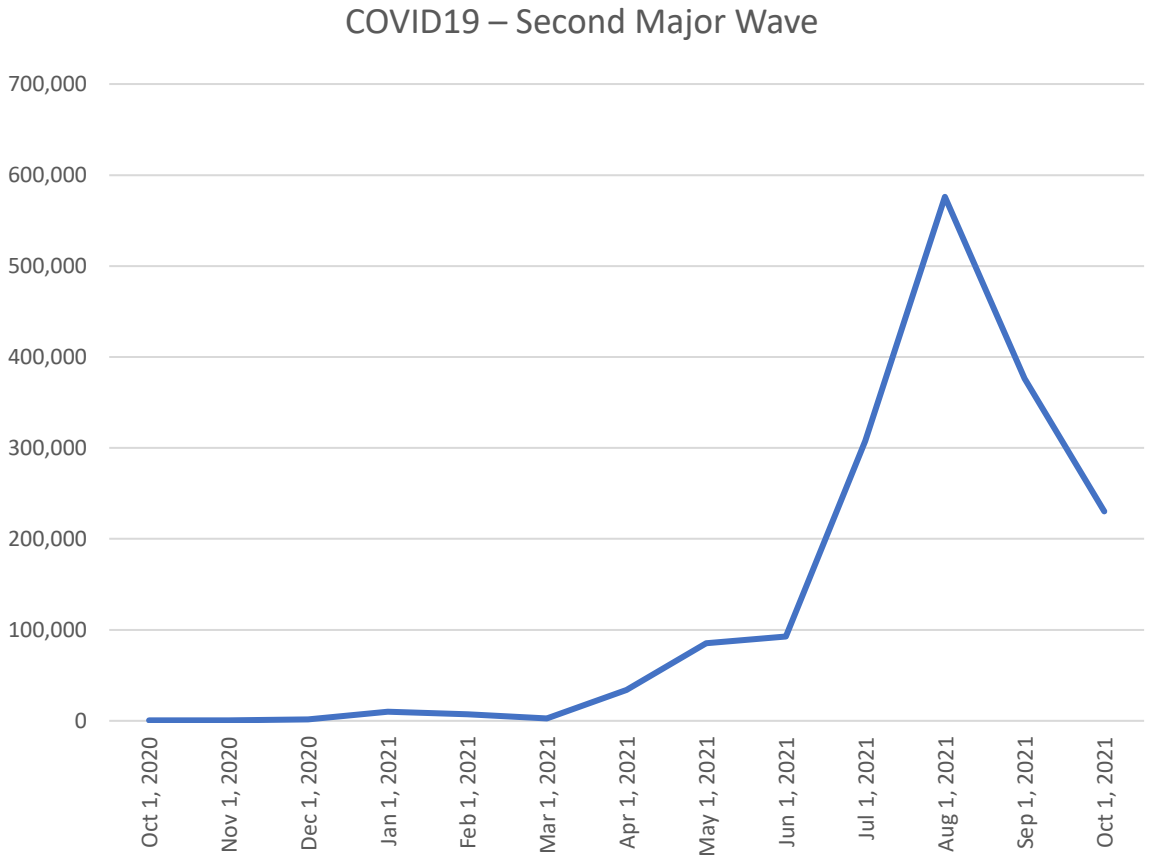
Macro growth projection	Actual 2019	Actual 2020	FPO (Oct'21) 2021f	NESDC (Nov'21) 2021f	BOT (Sep'21) 2021f	SCBS (Jul'21) 2021f	BOT (Jul'21) 2022f	NESDC (Nov'21) 2022f	SCBS (Jul'21) 2022f
GDP growth	2.3	-6.1	1.0	1.2	0.7	1.0	3.9	4.0	3.6
Private investment	2.7	-8.4	4.0	4.3	4.2	3.9	6.7	4.2	7.3
Public investment	0.1	5.7	8.1	4.8	8.0	9.1	6.4	4.6	5.1
Private consumption	4.0	-1.0	0.8	1.2	0.0	1.2	5.7	4.3	4.2
Public consumption	1.7	0.8	3.8	2.3	3.3	3.1	-0.5	0.3	2.5
Export value in US$ terms (%)	-3.3	-6.6	16.3	16.8	16.5	15.0	3.7	5.7	2.0
Import value in US$ terms (%)	-5.6	-13.5	29.2	23.2	23.8	18.2	4.8	1.0	3.3
Current account to GDP (%)	7.0	3.3	-3.7	-2.5	-3.4	-2.0	0.1	1.0	3.5
Headline inflation (%)	0.7	-0.8	1.0	1.2	1.0	1.2	1.4	1.4	1.4
USD/THB	31.0	31.3	31.9	31.9	N/A	31.5	N/A	32.5	32.0
Policy rate (%)	1.25	0.50	0.50	N/A	N/A	0.50	N/A	N/A	0.50
No. of inbound tourists (mn)	39.8	6.7	0.18	0.2	0.2	0.3	6.0	5.0	8.0

Source: SCB Securities

Introduction (cont'd)

COVID19 infected cases



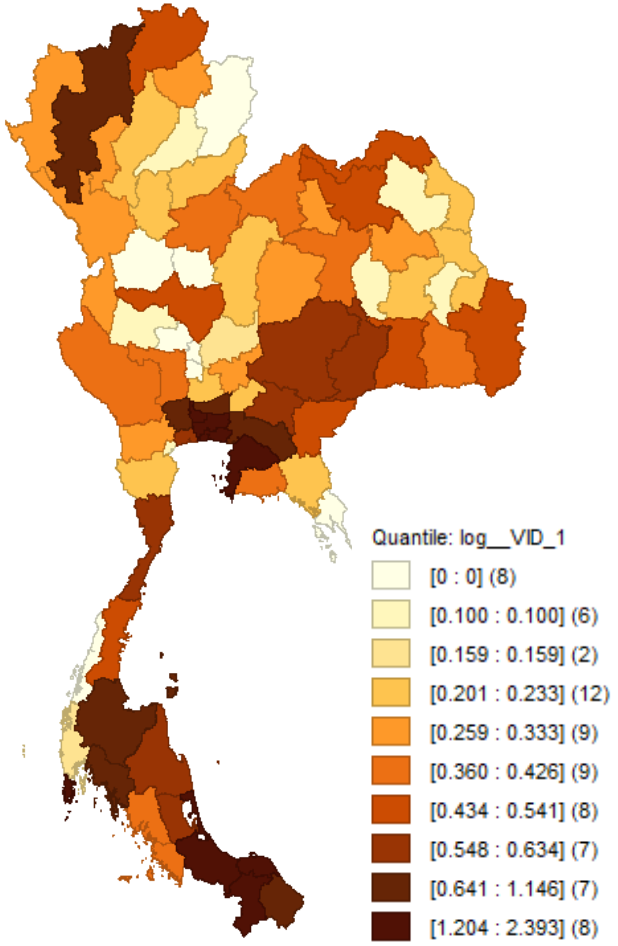


Source: Ministry of Public Health

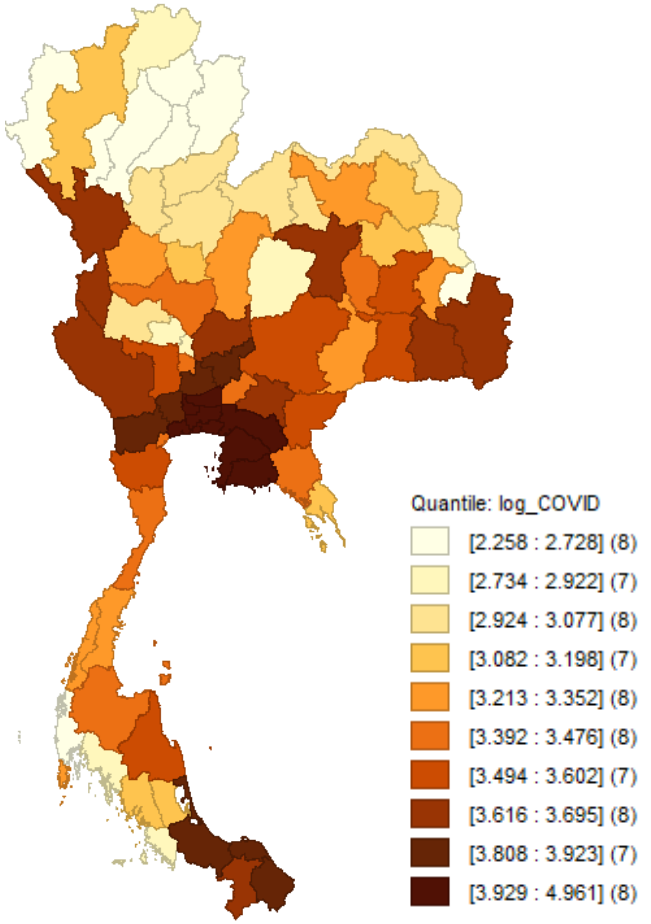
Introduction (cont'd)

Spatial distribution of COVID19 infected cases (logarithm scale)

First major wave
(March – May 2020)



Second major wave
(July – September 2021)



Main objective

- To examine the economic impacts of COVID19 by using the set of alternative indicators.
- Specifically, these indicators can be obtained from the following open-source data.
  - Nighttime Light Data (from Google Earth Engine)
  - Apple Mobility Index
  - Average Sentiment Index of Tweets (obtained from Twitter)
  - Number of infected cases (obtained from Ministry of Public Health)

Main tasks

Task #1: COVID19 and Nighttime Light (January 2020 – October 2021)

- Please compute the regression between the number of COVID19 infected cases and the nighttime-light index in the cases of following provinces:
  - Bangkok
  - Chonburi
  - Phuket
  - Chiang Mai

Task #2: COVID19 and Apple Mobility Index (January 2020 – October 2021)

- Please conduct the regression between the number of COVID19 infected cases and Apple Mobility Index in the cases of following provinces:
  - Bangkok
  - Chonburi
  - Phuket
  - Chiang Mai

Main tasks (cont'd)

Task #3: COVID19 and Sentiment Index (based on Twitter data)

- Please compute the provincial sentiment index by using RapidMiner and Twitter data (the latest 1,000 tweets related to "COVID") in these provinces:
  - Bangkok (13.7563° N, 100.5018° E with 200 km radius)
  - Chonburi (13.3611° N, 100.9847° E with 200 km radius)
  - Phuket (7.9519° N, 98.3381° E with 200 km radius)
  - Chiang Mai (18.7883° N, 98.9853° E with 200 km radius)

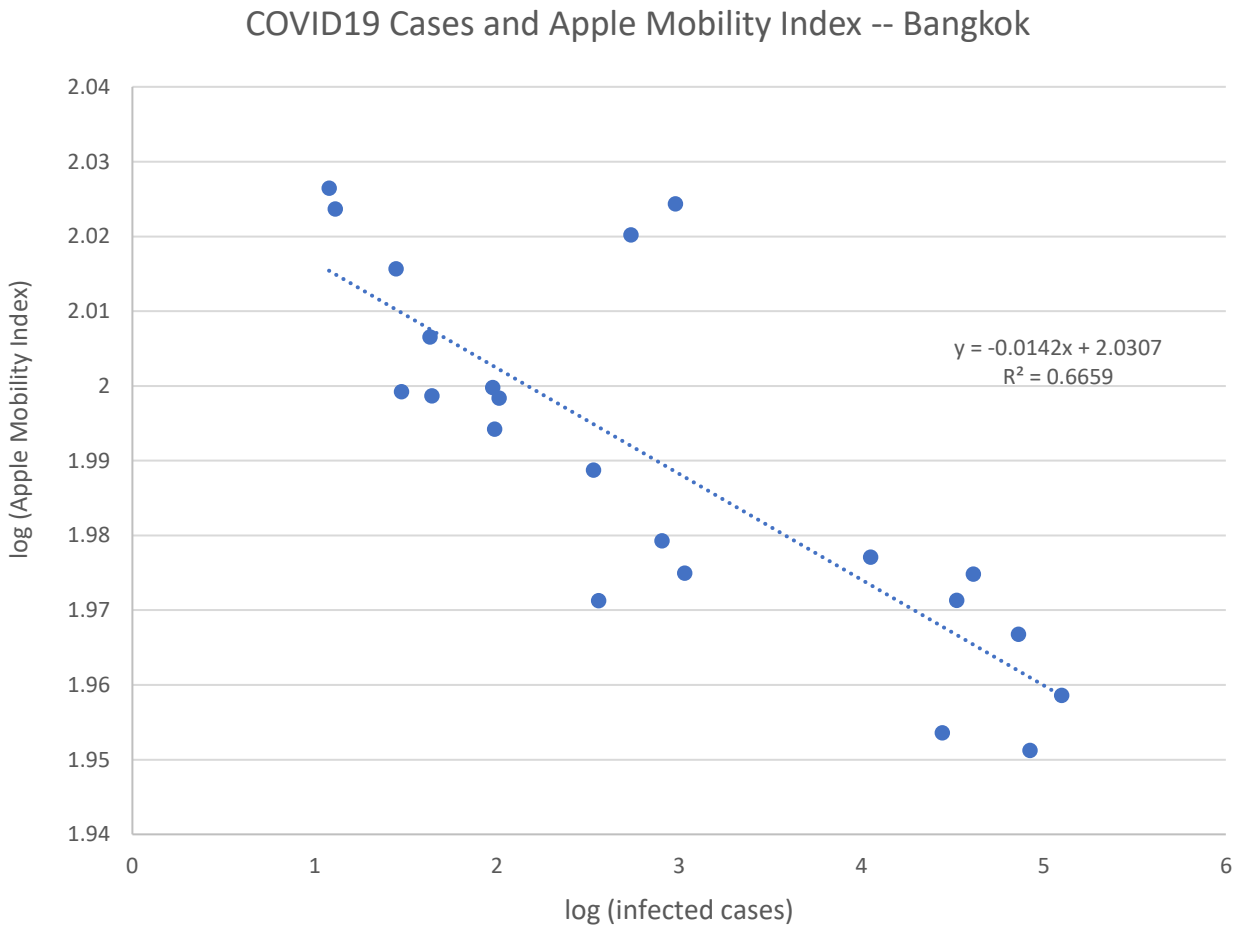
Task #4: Result discussion

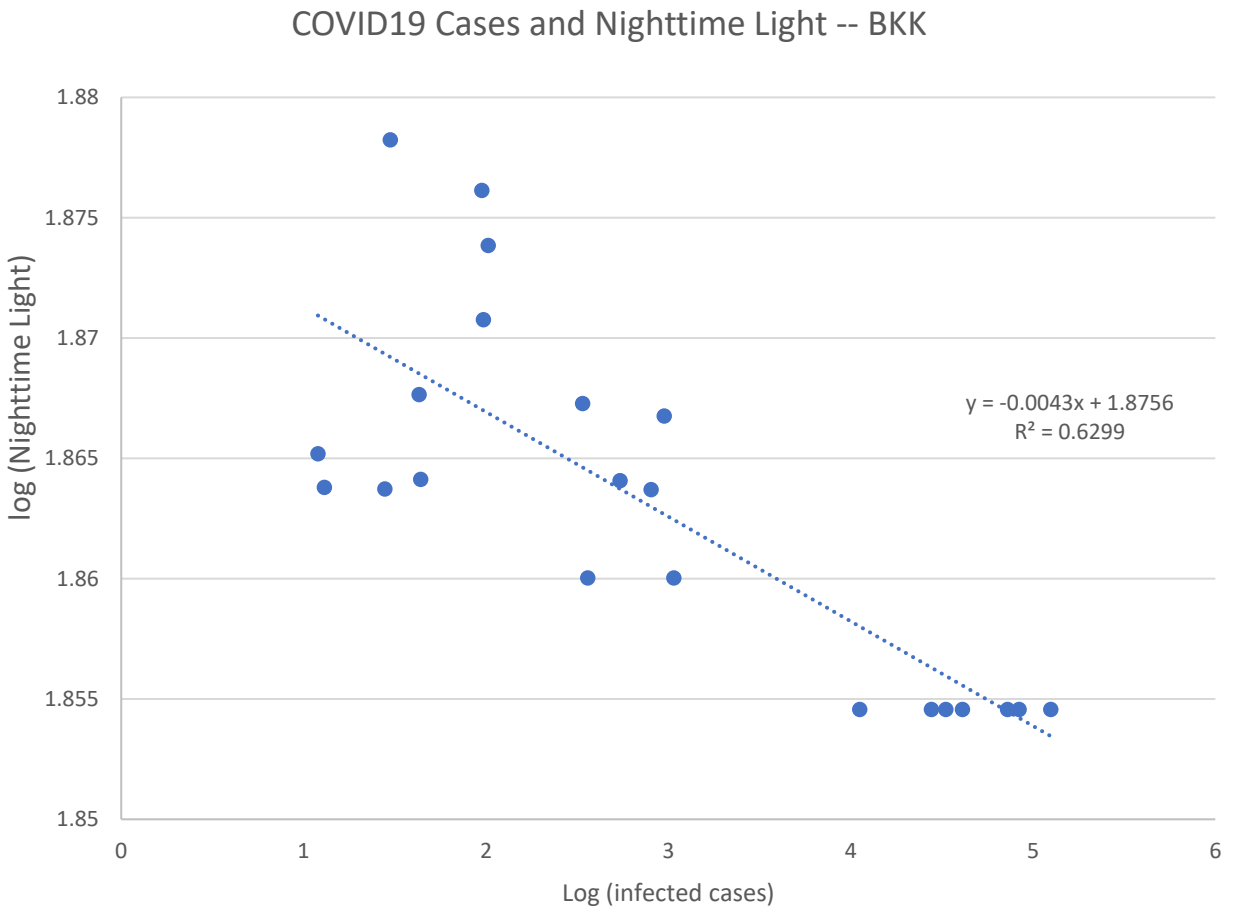
- Are Nighttime Light Index and Apple Mobility Index correlated with the COVID19 cases? Can both indicators represent the economic impact of COVID19?
- With the lessened restrictions of government's COVID19 containment policies, are the sentiment indices currently reflecting the positive attitude and recovering situation in those provinces?

Task #5: Other alternative data and methods are welcome (optional)

Main tasks (cont'd)

Examples of analytical results





Main tasks (cont'd)

Examples of analytical results

Province	No. of Related Tweets	Average Sentiment Index
Bangkok	85	0.008
Chonburi	85	0.005
Phuket	13	-0.173
Chiang Mai	9	0.054

Format of presentation

- **Presentation Dates:** November 24 & 26, 2021

  - PowerPoint: the format of consulting company (PowerPoint with texts and graphs/diagrams)
  - Submit the presentation file in the submission box on Moodle (by November 23, 2021 (11.00pm)).
  - Presentation session : 12 minutes
  - Q & A session : 3-5 minutes
  - Sequence of presentation : from draw

Format of presentation (cont'd)

- Length of presentation: 12-15 pages
- Structure of presentation

Part 1 – Introduction and project's background

Part 2 – Sources of data

Part 3 – Briefs of analytical methodologies

Part 4 – Results

- Task #1: COVID19 and Nighttime Light (January 2020 – October 2021)
- Task #2: COVID19 and Apple Mobility Index (January 2020 – October 2021)
- Task #3: COVID19 and Sentiment Index (based on Twitter data)
- Task #4: Result discussion
- Task #5: Other alternative data and methods are welcome (optional)

Part 5 – Policy recommendations

Grading Criteria

- **Quality of report (60%)**

  - appropriate methodologies (20%)

  - critical reasoning in result analysis and policy recommendation (20%)

  - format of PowerPoint (comprehensive graphical communication and concise text explanation) (10%)

  - on-time submission (10%)

- **Quality of presentation (40%)**

  - convincing verbal explanation (20%)

  - comprehensive Q&A (20%)