



Impact Analysis of COVID-19

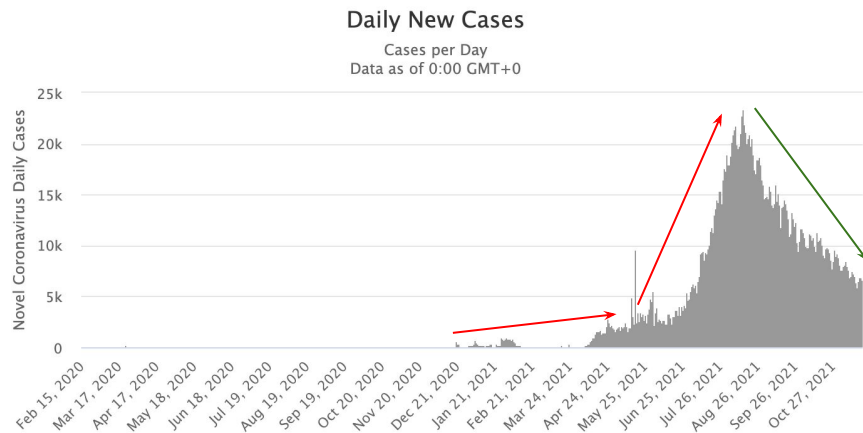
using alternative indicators



Introduction and Project's background

The number of COVID cases in Thailand have significantly increased in every new waves.

Daily New Cases in Thailand



Currently, number of cases is **now under the 7-days moving average** which reflect the optimistic outlook and better sentiment to citizens.

Bangkok, Chiang Mai, Chonburi have placed in the top-ten ranking of the accumulated infected covid-19 cases as of 20 Nov. 2021

1st

Bangkok

415,010 cases

3rd

Chonburi

105,819 cases

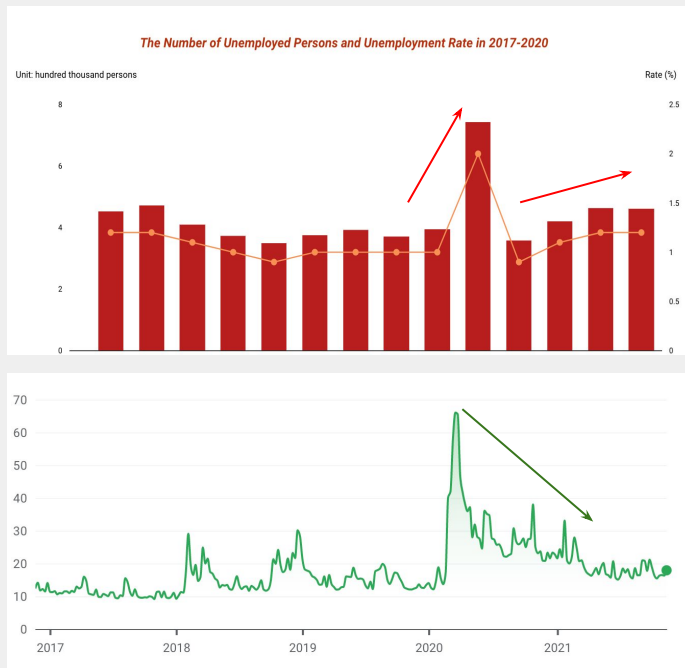
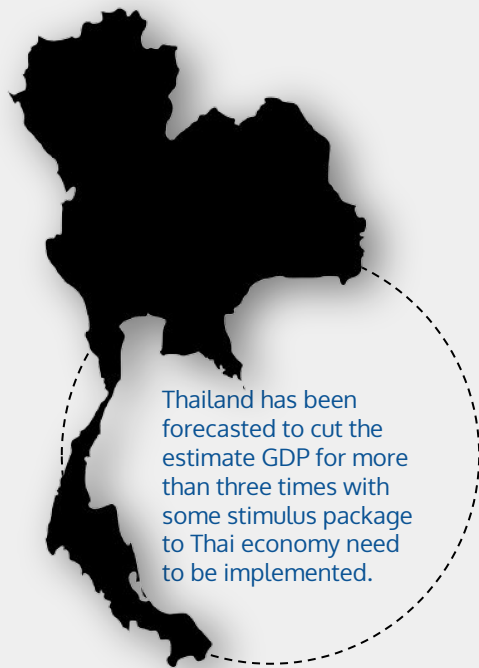
9th

Chiang Mai

23,970 cases

Introduction and Project's background

Thai economic outlook has been hit and downgraded with a huge loss including GDP cut and increased unemployment rate, with negative spill over to other main industries.



Not only the downgraded to the Thai GDP, the **unemployment rate** also sharply increase in Q2/2020. It shows the vulnerable in Thai labor market.

Eventhough we faced with many waves of COVID-19, the **VIX index** has shown the positive sentiment of the financial sector in each of the COVID occurrences.

Sources of Data



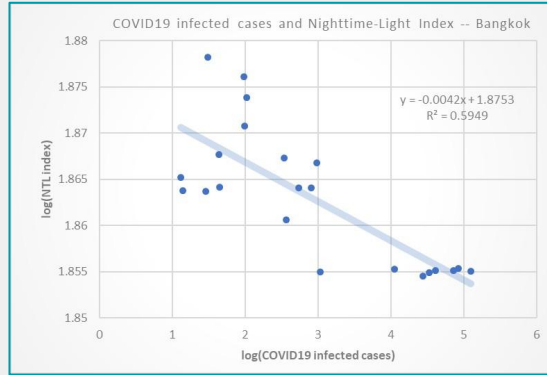
Apple Maps
Mobility Trends



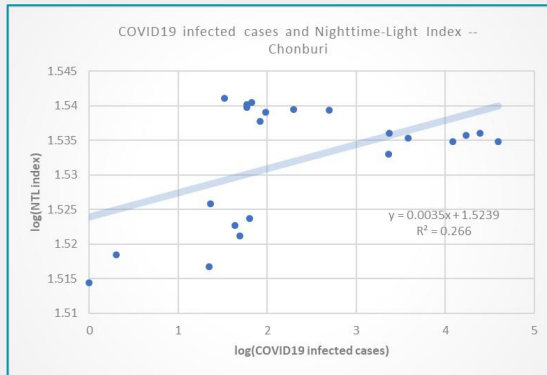


- Export data from ministry of public health, google earth, apple mobility trends, and twitter
- Import data from the ministry of public health, google earth, and apple mobility trends to microsoft excel
- Import data from twitter to rapid miner
- Computing all the indicators and constructing the scatter plot
- Compare and Analyze results

COVID19 and Nighttime Light

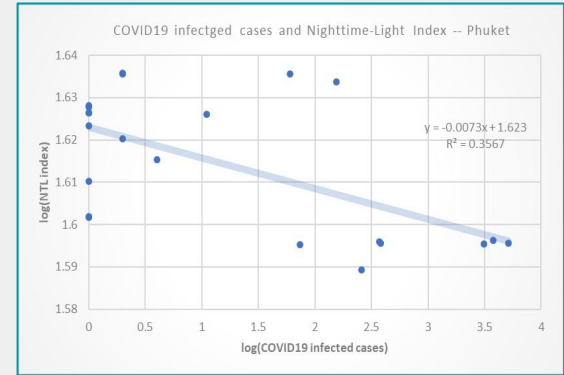
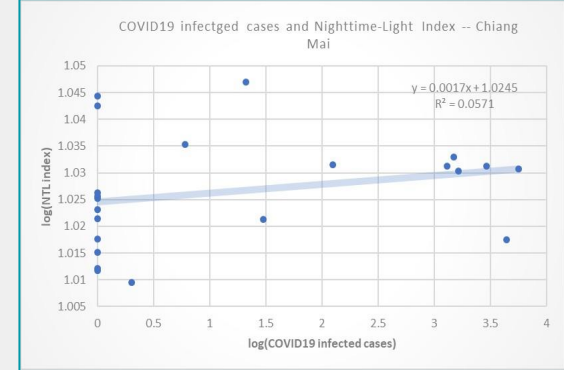


For the best proxy model to explain the relationship between the Nighttime-Light index and COVID19 infected cases, it belongs to Bangkok due to the highest R-squared at 59.49%.

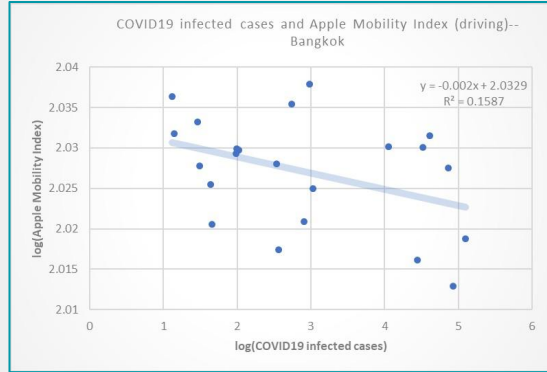


The lowest R-squared is in Chiang Mai case at 5.71%.

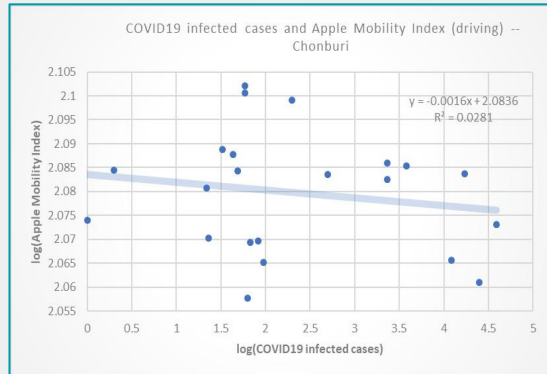
To conclude, Nighttime-Light index is inefficient to explain the COVID19 infected case due to the low value of R-squared in every cases.



COVID19 and Apple Mobility Index (driving)

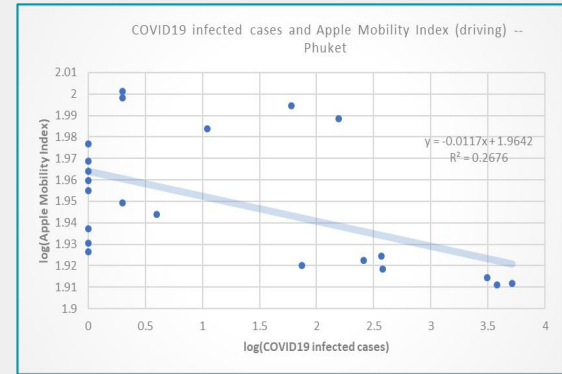
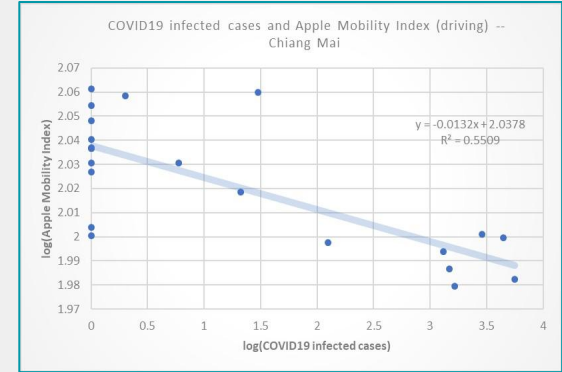


For the best proxy model to explain the relationship between the Apple Mobility index (driving) and COVID19 infected cases, it belongs to Chiang Mai due to the highest R-squared at 55.09%.

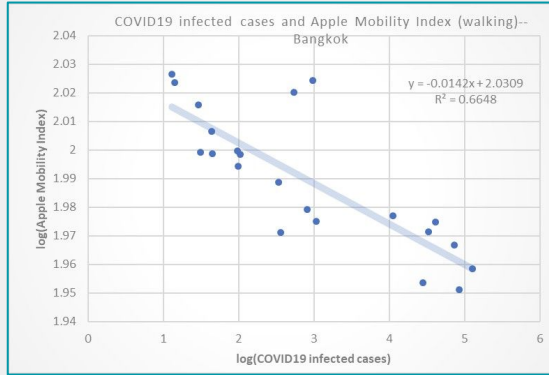


The lowest R-squared is in Chonburi case at 2.81%.

To conclude, Apple Mobility Index of driving is inefficient to explain the COVID19 infected case due to the low value of R-squared in every cases.

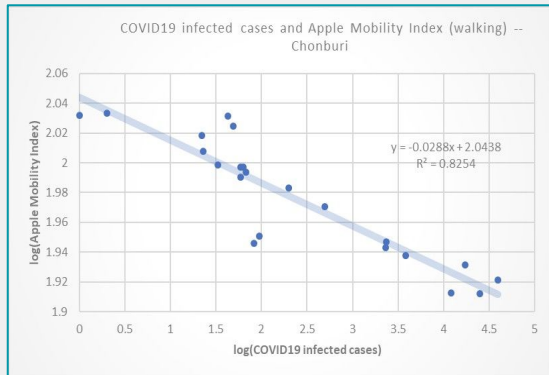


COVID19 and Apple Mobility Index (walking)

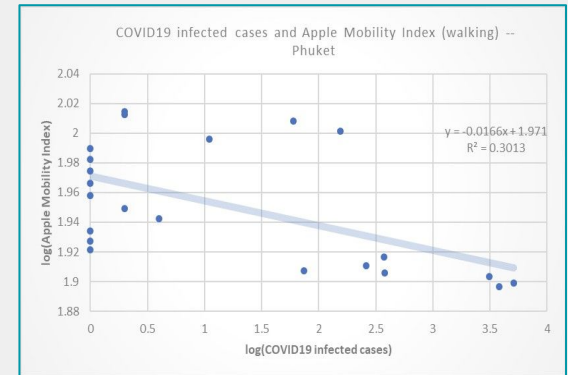
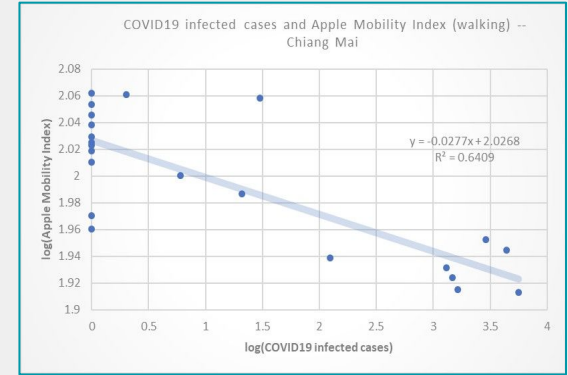


For the best proxy model to explain the relationship between the Apple Mobility index (walking) and COVID19 infected cases, it belongs to Chonburi due to the highest R-squared at 82.54%.

The lowest R-squared is in Phuket case at 30.13%.

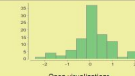


In conclusion, overall cases of Apple Mobility Index (walking) is efficient to explain the COVID19 infected case due to the high value of R-squared in except Phuket.



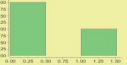
COVID19 and Sentiment Index (Based on Twitter data)

Id	Nominal	0	Least 1461670523071447043...	Most 1458430046452928514...	Values 1458430046452928514 (1), 1458439992884150273 (1), ... [97 more]
Score	Real	0		Min -2.436	Max 2.128
				Average 0.124	Deviation 0.825
Created-At	Date time	0	Earliest date Nov 10, 2021 8:43 PM	Latest date Nov 19, 2021 7:19 PM	Duration 8d 22h 36m 29s
From-User	Nominal	0	Least 待田 (1)	Most Matt Greenfield (13)	Values Matt Greenfield (13), The Pattaya News (12), ... [44 more]
From-User-Id	Nominal	0	Least 97634579 (1)	Most 15338019 (13)	Values 15338019 (13), 950695815047036929 (12), ... [44 more]
To-User	Nominal	47	Least zombodb (1)	Most sobri (6)	Values sobri (6), ASEANNOWTH (2), ... [43 more]
To-User-Id	Nominal	0	Least 944628652620124160 (...)	Most -1 (47)	Values -1 (47), 15338019 (6), ... [44 more]
Language	Nominal	0	Least en (99)	Most en (99)	Values en (99)
Source	Nominal	0	Least <a href= [...] d (1)	Most <a href= [...] (47)	Values <a href= [...] Phone (47), <a href= [...] droid (45), ... [3 more]
Text	Nominal	0	Least 'unvacci [...] hcyPd (1)	Most #COVID i [...] 3oQWh (1)	Values #COVID i [...] hCzQ3oQWh (1), #Pattaya [...] hyaE9dw2 (1), ... [97 more]
Geo-Location-Latitude	Numeric	93	Min 13.692	Max 13.862	Average 13.802
Geo-Location-Longitude	Numeric	93	Min 100.655	Max 100.752	Average 100.678
Retweet-Count	Integer	0	Min 0	Max 38	Average 0.929

Id	Nominal	0	Least 1461670523071447043...	Most 1458439992884150273...	Values 1458439992884150273 (1), 1458487599274860552 (1), ... [97 more]
Score	Real	0		Min -2.436	Max 2.128
				Average 0.100	Deviation 0.802
Created-At	Date time	0	Earliest date Nov 10, 2021 9:22 PM	Latest date Nov 19, 2021 7:19 PM	Duration 8d 21h 56m 58s
From-User	Nominal	0	Least 待田 (1)	Most Matt Greenfield (13)	Values Matt Greenfield (13), The Pattaya News (12), ... [45 more]
From-User-Id	Nominal	0	Least 97634579 (1)	Most 15338019 (13)	Values 15338019 (13), 950695815047036929 (12), ... [45 more]
To-User	Nominal	48	Least zombodb (1)	Most sobri (6)	Values sobri (6), ASEANNOWTH (2), ... [42 more]
To-User-Id	Nominal	0	Least 944628652620124160 (...)	Most -1 (48)	Values -1 (48), 15338019 (6), ... [43 more]
Language	Nominal	0	Least en (99)	Most en (99)	Values en (99)
Source	Nominal	0	Least <a href= [...] d (1)	Most <a href= [...] (47)	Values <a href= [...] Phone (47), <a href= [...] droid (44), ... [3 more]
Text	Nominal	0	Least 'unvacci [...] hcyPd (1)	Most #COVID i [...] 3oQWh (1)	Values #COVID i [...] hCzQ3oQWh (1), #Pattaya [...] hyaE9dw2 (1), ... [97 more]
Geo-Location-Latitude	Numeric	92	Min 11.975	Max 13.862	Average 13.541
Geo-Location-Longitude	Numeric	92	Min 100.655	Max 102.323	Average 100.913
Retweet-Count	Integer	0	Min 0	Max 38	Average 0.919

The sentiment Indices in Bangkok and Chonburi provinces reflect the positive attitude of people to COVID19 because of the average attitude scores are 0.124 (Bangkok) and 0.100 (Chonburi) respectively.

COVID19 and Sentiment Index (Based on Twitter data)

ID	Type	Count	Labels	Most	Values
Id	Nominal	0	14615395221493817351... 1459399031935827970... 1459399031935827970 (1), 1461357972802576387 (1), ...[1 more]		
Predict ion Score	Real	0	 Min: 0, Max: 1.513, Average: 0.504, Deviation: 0.873		
Open visualizations					
Created-At	Date time	0	Earliest date: Nov 13, 2021 12:53 PM, Latest date: Nov 19, 2021 1:05 AM, Duration: 5d 12h 12m 8s		
From-User	Nominal	0	Least: Tanya_Kh (1), Most: Fezzi Fezzino (1), Values: Fezzi Fezzino (1), ÈÀÄÛ□ (1), ...[1 more]		
From-User-id	Nominal	0	Least: 786393660719902721 (...), Most: 1560846930 (1), Values: 1560846930 (1), 2455955606 (1), ...[1 more]		
To-User	Nominal	2	Least: shoutwhisper (1), Most: shoutwhisper (1), Values: shoutwhisper (1)		
To-User-id	Nominal	0	Least: 2522000694 (1), Most: -1 (2), Values: -1 (2), 2522000694 (1)		
Language	Nominal	0	Least: en (3), Most: en (3), Values: en (3)		
Source	Nominal	0	Least: <a href= [...] m (1), Most: <a href= [...] d (2), Values: <a href= [...] droid (2), <a href= [...] agram (1)		
Text	Nominal	0	Least: Birthday [.] 0,mJF (1), Most: 1st traI [.] Tools (1), Values: 1st traI [.] QC Tools (1), @shoutnw [.] dXQ6NtC8 (1), ...[1 more]		
Geo-Location-Latitude	Numeric	2	Min: 7.894, Max: 7.894, Average: 7.894		
Geo-Location-Longitude	Numeric	2	Min: 98.296, Max: 98.296, Average: 98.296		
Retweet-Count	Integer	0	Min: 0, Max: 0, Average: 0		

Is Id	Nominal	0	Least 1461465443621691393... Most 1460254355416760323... Values 1460254355416760323 (1), 1461188810578882562 (1), ...[5 more]
Predict ion Score	Real	0	4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 0.00 0.25 0.50 0.75 1.00 Min 0 Max 0.974 Average 0.370 Deviation 0.429 Open visualizations
Created-At	Date time	0	Earliest date Nov 15, 2021 9:32 PM Latest date Nov 19, 2021 5:44 AM Duration 3d 8h 12m 26s
From-User	Nominal	0	Least Lewis King (1) Most Shwe Zin (2) Values Shwe Zin (2), Angone (1), ...[4 more]
From-User-Id	Nominal	0	Least 9911362 (1) Most 139192282040221264... Values 139192282040221264 (2), 1210467785702162433 (1), ...[4 more]
To-User	Nominal	5	Least spoonersean (1) Most 9JjpA4T7UcpUfZU (1) Values 9JjpA4T7UcpUfZU (1), spoonersean (1)
To-User-Id	Nominal	0	Least 893109378 (1) Most -1 (5) Values -1 (5), 1305269943571685377 (1), ...[1 more]
Language	Nominal	0	Least en (7) Most en (7) Values en (7)
Source	Nominal	0	Least <a href=[...] e (3) Most <a href=[...] d (4) Values <a href=[...] droid (4), <a href=[...] Phone (3)
Text	Nominal	0	Least Since wh [...] KeFCZ (1) Most @9JjpA4T [...] gwULT (1) Values @9JjpA4T [...] 2wElgwULT (1), @spooner [...] baffling (1), ...[5 more]
Geo-Location-Latitude	Numeric	7	Min ∞ Max ∞ Average ?
Geo-Location-Longitude	Numeric	7	Min ∞ Max ∞ Average ?
Retweet-Count	Integer	0	Min 0 Max 2 Average 0.429

The sentiment Indices in Phuket and Chiangmai provinces also reflect the positive attitude of people to COVID19 because of the average attitude scores are 0.504 (Phuket) and 0.370 (Chiangmai) respectively.

Result Discussion

Are Nighttime Light Index and Apple Mobility Index correlated with the COVID19 cases? Can both indicators represents the economic impact of COVID19 ?

For the case of the Nighttime Light Index and Mobility index on driving, these both cases cannot be mainly used as a alternative indicators to represents the COVID19 economic impact due to the low value of R-squared ,but in case of Mobility index on walking this alternative indicator has high value of R-squared in several provinces. Hence, this alternative indicator has significant relation to COVID19 which may enable us to determine the COVID19 impact on economics side as well.

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 ?

According to the sentiments indices result in selected provinces that overall attitude scores are positive , these can indicated that people's attitude and opinion for the COVID 19 issues are in the positive direction which can conclude that the lessened restrictions of the government's COVID19 containment policies currently reflect the positive attitude and recovering situation in all selected provinces. Moreover, we can also conclude that the sentiment index can be used effectively as alternative indicators to reflect people's attitude toward COVID19 situation.

Policy recommendations

1

Government should adopt the Apple mobility index on walking to be one of the tools for predicting or explaining COVID19 infected cases.

2

Government should invest more on these overall alternative indicators to enhance their efficiency to make these indicators become more consistent of COVID19 infected cases.

3

Government should implement aid program to stimulate SME and citizen's purchasing power to spur the economic recovering in the lessened restriction period.



Thank you

Naravitch Patwanichakul
6104641136
Nuttchanok Kesprathum
6104640237
Thanatat Mekaroonkamol
6104641326
Wongsatorn Hiranyalekha
6104640534