



EE 406 Contemporary Economic Issues

Thailand Private Consumption Index (PCI):
Service Index (SI): VAT Hotel & Restaurant Index

Presented to
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i) Introduction

Thailand's tourism industry is one of the most developed in Asia. It is noted for its warm hospitality, stunning beaches, historical sites, and eco-attractions, as well as its world-renowned cuisine, well-developed infrastructure, and reasonably priced lodging. Bangkok, Thailand's capital, is among the top ten most desirable cities in the world to visit, with a growth in visitors from China, the United States, India, and the Middle East. Two airports (Suvarnabhumi and Don Mueang), a Skytrain (BTS), an underground (MRT) rail system, and river boat services serve the city. Phuket, Pattaya, Huahin, and Chiang Mai are some of Thailand's other well-known tourist destinations.

The number of tourists visiting Thailand increased from 35.35 million in 2017 to 38.28 million in 2018 and 39.80 in 2019. Tourism plays an ever more important role in the Thai economy. According to the information from the National Economic and Social Development Council (NESDC) in February 2019, Tourism is accounted for 18.4 % (or close to one fifth) of the GDP of Thailand. It has risen from a level in 14.2 % of GDP just four years earlier.

The restaurant industry in Thailand has been prosperous and its contribution to the nation's GDP had been gradually rising since 2009 up until 2020 due to the impact of coronavirus (COVID-19) pandemic. Despite this, the number of eateries in that year grew. The restaurant industry frequently operates well despite the economy's ups and downs. In the coming years, the value of restaurant operations in Thailand is expected to rise. The range of eateries and contemporary food services appear to be popular among Thai urbanites in big cities where convenience is important. Furthermore, cafés and bars are some of the most popular meeting places for Thais. In recent years, the revenue of coffee shops in the country has been steadily expanding. Thailand is also noted for its extensive street food choices and availability. Due to the hurried lifestyle of the residents, purchasing meals from street stalls located throughout the country is a suitable and sensible option.

Thailand's low cost of living, especially when compared to other Asia Pacific countries, gives the Thai tourism and hospitality business a competitive advantage in terms of value for money for foreign visitors. The capacity of Thai hotel enterprises grows in tandem with the demand from both international and domestic travelers. Thailand's hotel sector is constantly improving in order to suit the needs of its visitors. Throughout the country, tourists will find everything from luxurious five-star hotels to budget hostels and guesthouses. Hotels in Thailand's northern region showed to be in high demand among other locations in terms of occupancy rates. Thailand had been seeing an increase in visitor numbers since 2015, prior to

the COVID-19 outbreak. As a result of the rise in visitors, the hotel business has benefited. In the past years, the majority of foreign tourists chose to stay in hotels during their visit among other accommodations such as guesthouses and hostels.

According to the most recent update, the COVID-19 pandemic has destroyed the Thai tourism industry, as it has many other countries. There were no foreign arrivals in Thailand after the declaration of a state of emergency on March 25, 2020, and the temporary closing of Thai borders to inbound tourists (from 3 April to 30 September). In October, the government launched the Special Tourist Visa (STV), which permits foreign tourists to enter the country under severe conditions such as a 14-day quarantine upon arrival, COVID-19 testing before and after arrival, and verification of valid health insurance coverage. But overall, in the first 11 months of 2020, tourist arrivals plunged 81.4% YoY, led by tourists from China (-87.7% YoY) and India (-85.5% YoY). Krungsri Research estimates that the tourism sector lost about THB1.5trn in foreign tourist receipts in 2020, based on THB1.9trn total receipts in 2019. Hoteliers are facing unprecedented disruption. From January to November 2020, average occupancy rate slumped to 29.3% from 69.7% in the same period in 2019. Average revenue per room across the country fell 73.6%. Operators have responded in a number of ways to these problems. This included lowering lodging rates, reworking the services they provide, focusing more on domestic tourists, and reducing overheads. They're also attempting to develop new revenue sources, such as attractive 'work-from-hotel' packages to capitalize on the work-from-home policy and partnering with internet delivery services to generate money for on-site restaurants, albeit this is mostly limited to 4- and 5-star hotels. However, most small and medium-sized hotels have been forced to close their doors, either temporarily or permanently.

In this paper, data from Thailand Private Consumption Index (PCI): Service Index (SI): VAT Hotel & Restaurant Index was used as a conventional data and the keywords from the google trend as an alternative data. The goal of this paper is to demonstrate how accurate terms in Google Trend can be used as alternative sources of data in this research, and to show how alternative indicators may be used as part of forecasting in various institutions. It is possible to ensure that, while using official data for analysis, the alternative set of data can also be used as a complement.

ii) Literature Reviews

1. Literature related to research methods

- ❖ Suthamma Nitikasetsoontorn (2015), *The Success Factors of Community-Based Tourism in Thailand*, this paper employed a mixed method approach to data collection and data analysis. It mainly employed quantitative method to assess the success factors of community-based tourism in Thailand. In this research, quantitative analysis through the use of a structured questionnaire and a statistical hypothesis test provides information on the factors fostering the success of community-based tourism. Findings from quantitative analysis reveal the significance and relationship among those factors represented in terms of numbers.
- ❖ Tanida Tanasubsinn (2018), *Tourist Satisfaction with Hotel Brands (Thai and International): A Case Study of Pattaya, Thailand*, A quantitative methodology was used in this study in which a questionnaire survey was employed as a research instrument. Multiple regression analysis and independent sample t-test were employed to test the hypotheses on tourist overall satisfaction with hotel brands where the means comparison method was used to test the differences between hotel brands.
- ❖ Hongyi Huang (2019), *Research of the tourism industry development strategy in Bangkok of Thailand*, This paper adopts the qualitative research method. Qualitative research is a method in which researchers obtain data under natural conditions by historical review, literature analysis, interview, observation, participation experience and other methods, and analyze by non-quantitative means to reach research conclusions.
- ❖ Siwarit Pongsakornrunsilp (2020), *The Art of Survival: Tourism Businesses in Thailand Recovering from COVID-19 through Brand Management*, Qualitative research was employed to collect data from stakeholders in Thailand's tourism industry, including hotel owners, management teams, tour guides, tourism organizations, academics, and so on, to bring together multiple perspectives on the crisis.
- ❖ Apikwan Wangdan (2016), *Factors that influence to tourist's intention to choose non – franchise hotels in samui island*, This paper uses quantitative research which use the survey and questionnaire as the tools for collect the data from the population. So the research is study what the factor that influence to the customer decision making to choose the no – franchising hotel management.

2. Literature related to datasets

- ❖ Jerome Agrusa (2006), *Thailand as a Tourist Destination: Perceptions of International Visitors and Thai Residents*, The datasets for this study consisted of two groups, Thai residents and international travelers. In an effort to learn more about the perceptions of these two groups, surveys were given to 190 Thai residents from 37 different provinces in Thailand, and 232 international travelers from 23 US states and 32 different countries. Of these 232 international travelers, almost 70% had never been to Thailand before.
- ❖ Charnsid Leelakasemsant (2018), *Entrepreneurial Marketing Strategic Posture, Marketing Activities, and Firm Performance: Evidence from the Thai Hotel Industry*, The datasets in this study is the Thai hotels from all regions of the country. The sample included both independently owned hotels and hotel chains that vary in size. The survey then was distributed to 2,600 randomly selected hotels throughout Thailand. This resulted in the total usable questionnaire of 369 sets, a response rate of 14.90 percent.
- ❖ Karissa Baguisi (2015), *A Study of Tourist Level Of Satisfaction And Its Effects On Thailand's Tourism*, The datasets of this study was international tourists who visit major attractions in Thailand. A convenience sample of 300 tourists at major tourist attraction places in Bangkok was surveyed.
- ❖ Charnsid Leelakasemsant (2018), *Thai Hotel Classification: A Cluster Analysis Based on Entrepreneurial Marketing Characteristics*, The datasets in this study were collected through a mail survey, with the target population being all general or marketing managers working in the Thai hotel industry. The final list contains the names and addresses of 7,723 hotels, of which 3,000 were randomly selected and the mail questionnaires distributed to them. The total usable questionnaires were 369, a response rate of 13.29 percent.
- ❖ Bhanupong Nidhiprabha (2007), *Adjustment and Recovery in Thailand Two Years after the Tsunami*, Twenty-three fishery households (Fishers) were randomly selected from Phang Nga, eight from Phuket, and five from Krabi. Those in the Entrepreneur category were mainly small business operators involved in tourism-related businesses such as restaurants, shop houses, and guest houses. The Laborer category includes those who were employed in hotels, restaurants, shop houses, department stores, and local administration. Beach Vendors provide various services to tourists on the beach, such as renting out beach umbrellas and chairs and selling food. The activities of NGOs have

been concentrated primarily in Phang Nga, where the need for assistance was deemed to be strongest. Overall the datasets ample was reasonably gender balanced (52 per cent males, 48 per cent females)

3. Literature related to sub-topics, opportunity to grow after COVID-19 pandemic

- ❖ Puttachard Lunkam (2021), *Industry Outlook 2021-2023: Hotel Industry*, The situation will improve in 2022 and 2023. Operators' revenues will recover along with the overall recovery of the tourism sector over the next 2-3 years. For foreign tourists, arrivals should increase steadily with the expansion of the STV scheme and Thailand possibly signing quarantine-free travel bubble programs with several countries (figure 4). By the second half of 2021, the accelerating vaccination programs worldwide will also help to boost foreign arrivals. For domestic tourists, throughout 2021, the tourism and hotel industries will be heavily reliant on domestic tourism. However, given that many countries still have restrictions on foreign arrivals, this could encourage Thai tourists to travel more within Thailand. Krungsri Research estimates that Thai tourists will make 110 million domestic trips this year, 125 million in 2022, and 145 million in 2023 (Figure 5). This would be supported by the following 1) Government measures to stimulate the tourism sector: These are expected to continue. They include: (i) *the 'We Travel Together' program* (ii) *additional holidays* (iii) *tax refund* 2) Low oil prices and 3) Infrastructure development
- ❖ Puttachard Lunkam (2021), *Tourism & Hotel industry in the post-COVID world*, In the coming period, the success factors for hoteliers will not be limited to the conventional criteria such as location, quality of rooms, pricing, and facilities available to guests. They will include the extent to which hoteliers cooperate and work together with local communities and other businesses, as well as how quickly and effectively they respond to change and manage risks. On this note, operators need to urgently review and make adjustments in their business playbooks ahead of the reopening of international borders and return of foreign tourists. This will allow players in the tourism and hotel industry to secure the required foundation to capture maximum gains from the strong recovery in foreign tourist arrivals to pre-pandemic levels, and to ensure this remains sustainable.
- ❖ Krungsri Research (2020), *Thailand Industry Outlook (Focuses on Hotel industry)*, The outlook for hotel business is upbeat, premised on the anticipated 5-7% p.a. rise in

foreign tourist arrivals and 4-5% p.a. growth in domestic tourism. Hotels in Bangkok, Pattaya and Phuket: Operators' income in these major tourist destinations should remain robust. Industry players will continue to increase the supply of hotel rooms to meet rising visitor numbers. Hotels in regional centers and key tourist areas, operators' earnings will grow slightly. Lastly, Hotels in other areas, earnings should be flat. In conclusion, Hotels in all areas will have to contend with rising competition and room supply, from other hotels as well as providers of temporary accommodation.

- ❖ ThaiWebsites.com (2021), Thailand's tourism sector may be affected in the long and short run by, Air Pollution in Bangkok and Chiang Mai, Currency Fluctuations (strong Thai Baht), Double & Erratic Pricing, and Covid-19 Pandemic. The plan of the government as expressed by prime minister Prayut, was to open the country from 1 November 2021 for tourists from a selected number of countries. Originally people from a limited number of countries (later modified to more countries, divided into different categories) were to be allowed into the country, entry for visitors conditional: only fully vaccinated persons, and a negative test for Covid before departure.
- ❖ Kasikornresearch (2021), Full-Service Restaurant Business Set to Resume Growth of 26.5% in 2022, It is expected that in 2020 the full-service restaurant business will be supported by specific measures, including the government's further easing of lockdown measures and reopening to international tourists. If the domestic COVID-19 situation improves or there is no resurgence of the COVID-19 pandemic that will prompt the government to reimpose lockdown restrictions, it is expected the full-service restaurant business will be able to rebound further after reporting a sharp contraction over the past two years.

4. Search gap

Lacking behind the technology in the aspect of research methodology as the world moves swiftly. As i read some research papers, most of the data used in further analysis depend on the method as the qualitative analysis which is questionnaires. It can create problems of sample size and bias unlike the alternative set of data obtained from Google trend that can solve the problems mentioned above, and can enhance the effectiveness of the result analysis in the research paper.

iii) Data& Methodology

3.1) Data

In this study, the data was collected from January 1st, 2007 to September 30th, 2021. The Dependent Variable which is Conventional Data was obtained from the Bank of Thailand under Private Consumption Index and the Independent Variables which is Alternative Data was obtained from Google Trends.

Table 1: Source of Data

Data	Source of data	Unit
Thailand's Private Consumption Index (PCI), Service Index (SI), VAT Hotel & Restaurant Index	Bank of Thailand	Standardized index
Keyword Search	Google Trends	Number of searches

3.2) Methodology

The approaches employed in this work are OLS regression analysis as a quantitative forecast, as well as various alternative data sets as a quantitative prediction. Regression analysis is a reliable method of identifying which variables have impact on a topic of interest. The process of performing a regression allows you to confidently determine which factors matter most, which factors can be ignored, and how these factors influence each other.

Ordinary Least Square Regression (OLS) The method of estimation, commonly named linear regression, is a method for estimating unknown parameters and coefficient of the relationships expressing in the model. This method corresponds to minimize the sum of square differences between the observed and predicted values. The technique may be applied to single or multiple explanations of variables and also categorical explanation of variables. OLS is used in the fields as economics (econometrics), political science, psychology, and electrical engineering.

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_ix_i + \varepsilon$$

Where

Y_i = Dependent variable

α = Intercept in the regression model

β = Coefficient of each independent variables

X = Independent variables

ε = error term of the regression model

As the conventional index comprise of both hotel and restaurant and also related to the tourism industry, we have to select the google trend keyword which need to be parallel and cover the topic. The criteria for selecting the keyword then based on Hotel and Restaurants index which include three main keyword Hotel, restaurants, and tourism. Then we combined all 6 keywords combined in the model altogether resulted in enhanced of the R-square value.

Variables	Description
y	Conventional data “VAT Hotel & Restaurant Index”
x_1	Keyword searched, ที่พักเชียงใหม่
x_2	Keyword searched, ที่พักพัทฯ
x_3	Keyword searched, พัทยา
x_4	Keyword searched, hotel Pattaya
x_5	Keyword searched, hotel Phuket
x_6	Keyword searched, โรงแรม กรุงเทพฯ
ε	Error term of the regression model

iv) Result Analysis

The regression results from the data from January 1st, 2007 to September 30th, 2021., which are presented in the Summary of the OLS regression, Table 3; Appendix 2. This paper has the sample size of 177 observations with the monthly data. The exogenous variables chosen in this experiment are ที่พักเชียงใหม่, ที่พักพัทยา, hotel Pattaya, hotel Phuket, โรงแรม กรุงเทพฯ, พัทยา, Chiang Mai, Hua Hin, Phuket, Recommended Restaurant, Restaurant, Hotel, Recommended Hotel, and Hotel Huahin. But when running the OLS regression, Chiang Mai, Hua Hin, Phuket, Recommended Restaurant, Restaurant, Hotel, Recommended Hotel, and Hotel Huahin were not significant, so I remove them. But still use these keywords search to predict the trend.

The hotel and restaurants index show the cyclical pattern, seasonal movement in the increasing upward sloping. From the figure 6, the trend of the data which tend to be peak at the first quarter in a year and last quarter in a year which can also suggest that trend of the data tend to increase in a seasonal period of that year. For the key-finding, from all result and some significant-point in the official data and alternative data, the behavior of the index can be analyzed and explained. First the result from the historical trend of conventional indicator, implies that in a first and last quarter of a year which are seasonal period, the searching for a related keyword “Hotel and restaurants” will be high because of the behavior of people as most people want to travel and booking for vacation in that seasonal period. For Historical trends of alternative indicators. In the first case or keywords we use Tourism keywords. From the figure 7, overall tourist attraction places which are Phuket pattaya and Huahin will have high season along first quarter or specifically peak in April. However, Chiangmai will reaches peak at December instead. For the figure 8, this graph derive from restaurant keywords in this figure it might really hard to predict or specify because of its fluctuations. However, one thing that we see is restaurant keywords tend to have upward sloping over period which may infer that people are more approachable to use google as a medium for finding new restaurants. Next, for figure 9, which derive from the hotel keywords overall the graph may look fluctuate because of several independents variable. However, it actually shows the clear cycle. To explain, this graph has really close relationships with the graph from tourism keywords because 3 tourist attractions places including Pattaya, Huahin and Phuket will peak in April. Only Chiangmai that peak in December instead.

In this model, 6 independent variables or set of alternative indicators are used and the result is that these variables have significant level of 0.05. In this case R squared is approximately at 69.75%. This can be implied that the combining set of our independent variables can explain or predict the official data by approximately 69.75%.

For the next analysis part of people behavior, in this case if we rely on our alternative indicators historical trends, the hotel and Tourism keywords share substantial similar trends in terms of high and low season period. From the previous figure, we indicated only that 3 tourist attractions places including huahin, pattaya, and Phuket will peak in April, but only Chiangmai will peak in December instead. Hence, from these data trends we will able to predict that seasonal may be the vital factors for determining the behavior of people. To clarify, in the summer or around April people will prefer to take the vacation along the sea coast. However, during the winter the northern region of Thailand or Chiangmai will be more attractive instead.

The goal of this study is to demonstrate how accurate keywords in Google Trend, which is an alternative source of data, can be used in forecasting in various institutions, as well as to illustrate how accurate alternative indicators may be used in this analysis. And the result are these alternative data sources can be used as part of the forecasting process to improve accuracy and data support. However, this also have the disadvantages and limitation which is the VAT Hotel & Restaurant Index, the data collected from Bank of Thailand. This index is made up of a number of components that come from the hotel and restaurant industries, with a very high level of sophistication in the computation from the Bank of Thailand before being released to the public as an index. To forecast this index with high accuracy, advanced mathematical techniques and a higher degree of econometrics may be required, resulting in a reduction in error term and an increase in independent terms. Moreover, human behavior does not follow the forecast exactly.

V.) Conclusion and policy recommendation

Data from Thailand's Private Consumption Index (PCI): Service Index (SI): VAT Hotel & Restaurant Index was utilized as conventional data in this paper, and keywords from Google Trends were used as alternative data and the data was collected from January 1st, 2007 to September 30th, 2021. The approaches employed in this work are regression analysis as a quantitative forecast, as well as various alternative data sets as a quantitative prediction and a sample size of 177 observations was used.

For the search gap, as the world advances faster, we are falling behind in terms of study methods. As I looked through numerous research articles, I discovered that the majority of the data utilized in further analysis is dependent on the method of qualitative analysis, which is questionnaires. It can lead to sample size and bias issues, as opposed to the alternative set of data gathered from Google Trends, which can eliminate the concerns listed above and improve the effectiveness of the result analysis in the research article.

The purpose of this article is to show how correct phrases in Google Trend can be used as alternative data sources in this research, as well as how alternative indicators may be employed as part of forecasting in different institutions. It is possible to ensure that, in addition to using official data for analysis, the alternative set of data can be used as a supplement. From these data trends we will be able to predict that seasonal may be the vital factors for determining the behavior of people. To clarify, in the summer or around April people will prefer to take the vacation along the sea coast. However, during the winter the northern region of Thailand or Chiangmai will be more attractive instead.

The research has indicated main 3 points for summary and recommendations. For the first point, from this research I consider that now google trend already able to predict or evaluate hotels and restaurants performance which highly correlated to tourism industry in each period. As a result, government must focus on targeted industry as new economic S-curve and they may incorporate with these alternative data set as well. Next, for the second point after government foster on the tourism industry. I suggest two main concerns that government should interest or focus. For the first case, during peak period or high season government should keep promoting and advertising. However, in the low season government may need to involve by adopting some expansionary policy for boosting people demanded. Hence, these actions will create the spillover effect to the economy which will bring up several benefits to

the nation including lower unemployment rate and more income distribution as well. Furthermore, the economy will get expansion or it will face with an increasing in the annual sector's growth rate. For our last point, according to the summary output and regression equation it can be used to predict the official data by relying on the set of alternative data. However, with the computation results of R squared this model may also need others alternative indicators to supplement for higher level of accuracy.

For the future improvement for this research, as in this research only used the alternative data from Google Trend. We can try to improve this by increase the number of alternative data sets used in forecasting. Nonetheless, the keyword search's scope. The data will be explored by Google Trend depending on the keywords entered by users. Further study might include a broader range of terms directly and indirectly connected to the VAT Hotel & Restaurant Index, which would match well with the analysis.

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Appendix 1

Figure 1 *International Tourist Arrivals in Thailand*

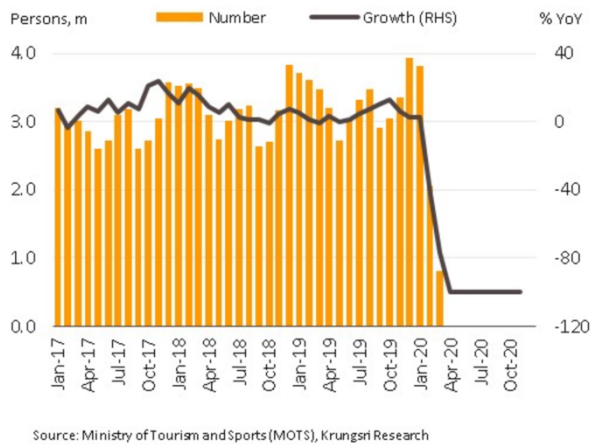


Figure 2 *Hotel Occupancy Rate*



Source: Bank of Thailand (BOT), Krungsri Research

Figure 3 *Changes In Room Rates For Hotel In Bangkok, Chiangmai, Phuket, Hua Hin, And Chonburi*

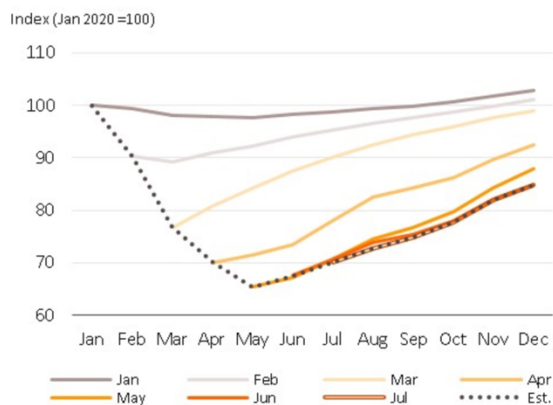


Figure 4 *Travel Bubbles Potential*

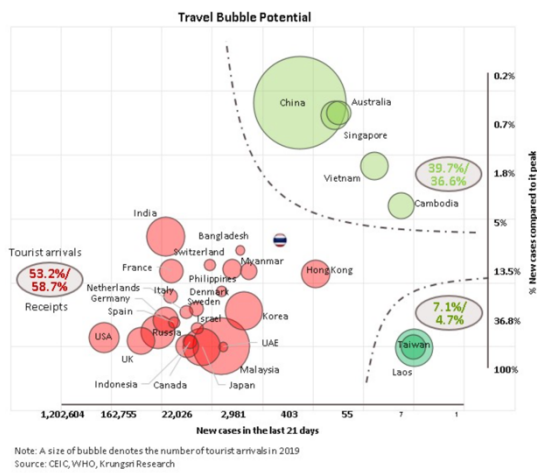


Figure 5 *Thai Inbound tourists*

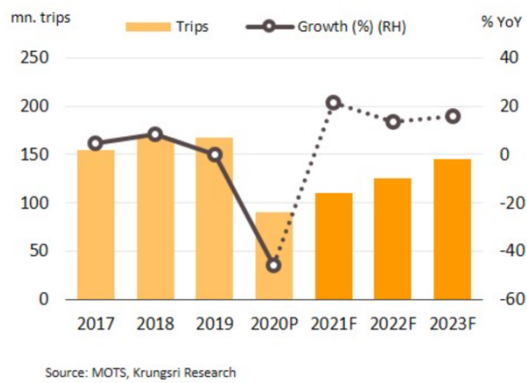


Figure 6 *Conventional Data*

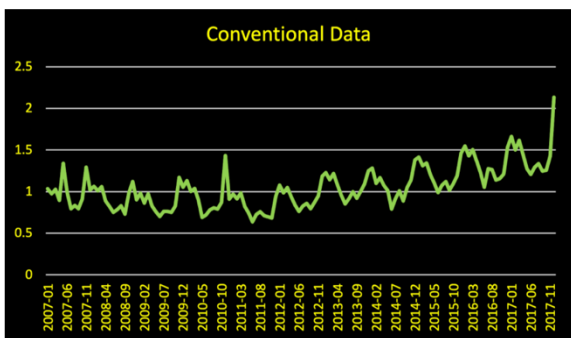


Figure 7 *Alternative Data (Tourism Keywords)*

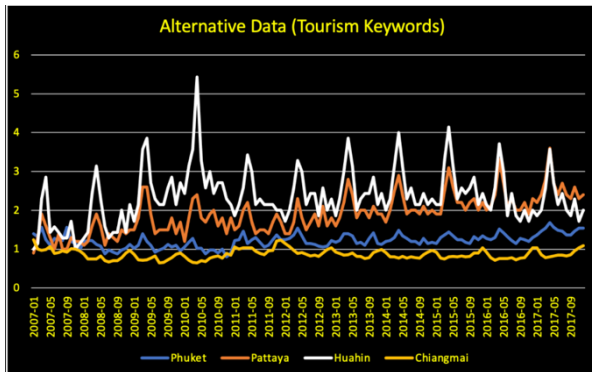


Figure 8 *Alternative Data (Restaurants Keywords)*

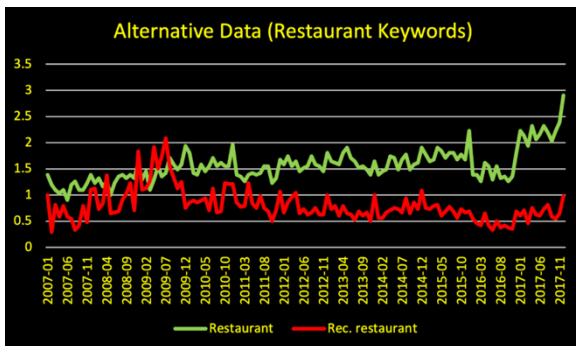


Figure 9 *Alternative Data (Hotel Keywords)*

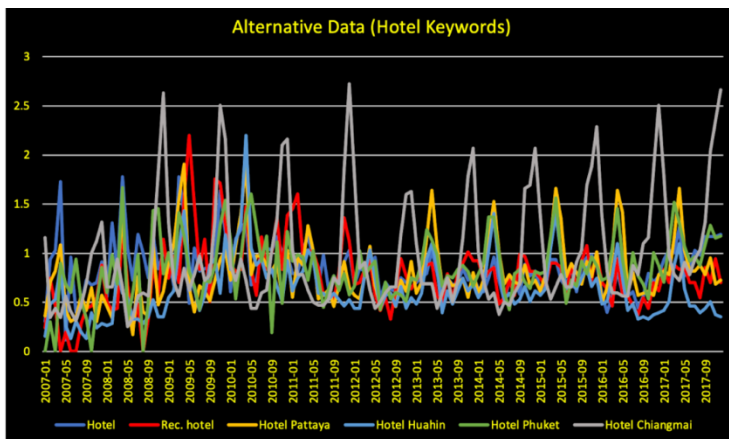
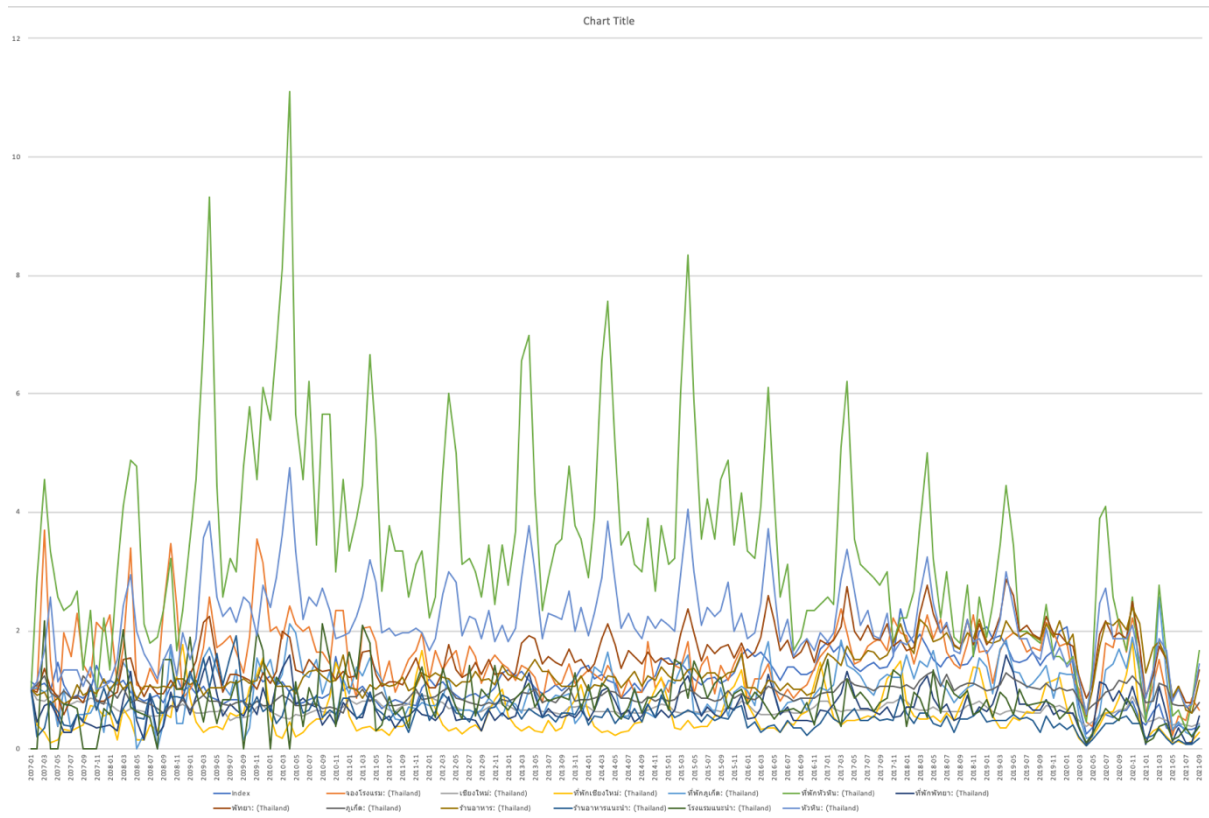


Figure 10



Appendix 2 Table 3 OLS regression

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.83516662
R Square	0.69750328
Adjusted R Square	0.68682693
Standard Error	0.21967978
Observations	177

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	6	18.9171051	3.15285086	65.3315953	1.3357E-41
Residual	170	8.20406486	0.04825921		
Total	176	27.12117			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-0.1265582	0.09046297	-1.3990053	0.16363323	-0.3051336	0.05201723	-0.3051336	0.05201723
ที่พักเชียงใหม่: (Thailand)	0.20758539	0.04686755	4.42919213	1.6884E-05	0.11506806	0.30010271	0.11506806	0.30010271
ที่พักพัทลุง: (Thailand)	-0.3793787	0.10465232	-3.6251344	0.00038134	-0.5859641	-0.1727933	-0.5859641	-0.1727933
พัทลุง: (Thailand)	0.64378574	0.06670079	9.65184545	7.5303E-18	0.51211726	0.77545421	0.51211726	0.77545421
hotel pattaya: (Thailand)	0.12901631	0.1023401	1.26066233	0.20915804	-0.0730048	0.33103739	-0.0730048	0.33103739
hotel phuket: (Thailand)	1.05140138	0.10611623	9.90801693	1.491E-18	0.84192617	1.26087658	0.84192617	1.26087658
โรงแรม กรุงเทพฯ: (Thailand)	-0.2927109	0.08355031	-3.5034092	0.0005871	-0.4576406	-0.1277812	-0.4576406	-0.1277812

