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สารนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต  
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ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

What is the suitable economic indicator that can be used to explain Malee's revenue in Thailand?



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An Independent Study Submitted in Partial Fulfillment of the Requirements  
for the Degree of Master of Arts in Business and Managerial Economics

Field of Study of Business and Managerial Economics

FACULTY OF ECONOMICS

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หัวข้อสารนิพนธ์

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## Introduction

There are so many economic indicators in our economy which used to describe so many things in our economy. Such are GDP growth, Interest rate, Unemployment rate, etc. And normal goods is said to be decreased in demands when average earnings are reduced which theoretically will reduced its price and revenue. Also in Thailand, where the inequality in earning is highest which indicated by GINI index is over 80% in 2019. (Credit Suisse, 2019) which may affected that GDP growth does not represent most of Thai population. So, it's maybe possible to describe what actual indicators can be used to explain the current economic trends in Thailand by using the performance of the company that's selling normal goods to explain the past situation instead. So, it might be possible to use economic indicator to predict future of revenue in some sectors.

Malee Group Public Company Limited is a company that was originally established as Malee Sampran Factory Company Limited on February 2, 1978 as a manufacturer and distributor of canned food and canned fruits which later entered the Thailand's Stock market in 1992. The Company is currently manufacturing and distributing canned fruits and UHT and pasteurized fruit juices under "Malee" brand together with distributing and marketing UHT, pasteurized milk, and milk tablet under "Farm Chokchai" brand, as well as other beverage products under Malee Brand for domestic and international markets. In addition, the Company also engages in Contract Manufacturing Business (CMG) in which the Company manufactures beverage products for other brand owners both domestically and internationally.

Although in this study, will mainly focus on Malee's domestic products and to see the effects from Thailand's economy towards the company's revenue or using only Malee's group domestic revenue. And by using ordinary least squares or linear regression model to calculate if each economic indicator affects the revenue or not. By focus on Unemployment rate, GDP Growth, inflation rate and earnings per head, using data from 2009-2019. Hypothesis will be confirmed by using OLS to check as if the Malee's revenue is affected by the economic factors or Income effect at all.

## Literature review

### 1. Background Information of Thailand Economy

Banks of Thailand reported 4 possible implications of Low unemployment rate in Thailand which included

1. Some workers have unstable jobs, most workers in the agricultural sector, which constitutes nearly one-third of the labor force, are self-employed and are not in the social security system.
2. Some workers in the agricultural sector are underemployed
3. Some workers have given up seeking jobs and are therefore excluded from the labor force.



4. Some workers confront skill mismatch given their educational levels or fields of studies.

(Bank of Thailand, 2019)

In the world bank group has report an increase in poverty over last few years in Thailand. From 2015 to 2018 it is slow but steadily increasing trend along with low GDP growth compared to other countries in the region. Which the reports are in accordance with the Thailand's National Statistics reports of decreasing trend in Average earning per Household and Credit Suisse's data of decreasing trend in Median Wealth per Adult. Even among the ASEAN country, where 2 of the countries that could use the increase in income to combat the poverty, which in Thailand it didn't happened for the lower income sector.

(World Bank Group, 2017)

## 2. Relation in Economic factors

“we have found that income inequality hardly responded at all to drastically rising unemployment in Finland and was also more or less unresponsive to the less drastic increases in Denmark” (Rolf Aaberge, 2000)

The statement suggests that the GINI index indicated the income inequality but it may not be affected by Unemployment or vice-versa. It's also insight that because of high inequality may affected the people to be more thrived to work as it's also possible that pays maybe low that in the end they have endured to works to keep on with daily expense.

“The findings indicated that GDP was affected by interest rate and real growth rate was affected by inflation rate. Meanwhile interest rate and real growth rate had feedback relation existence. However, this study proved that interest rate and real growth rate have interdependent lead and lag relationship.” (Abdul Aziz Farid Saymeh, 2013)

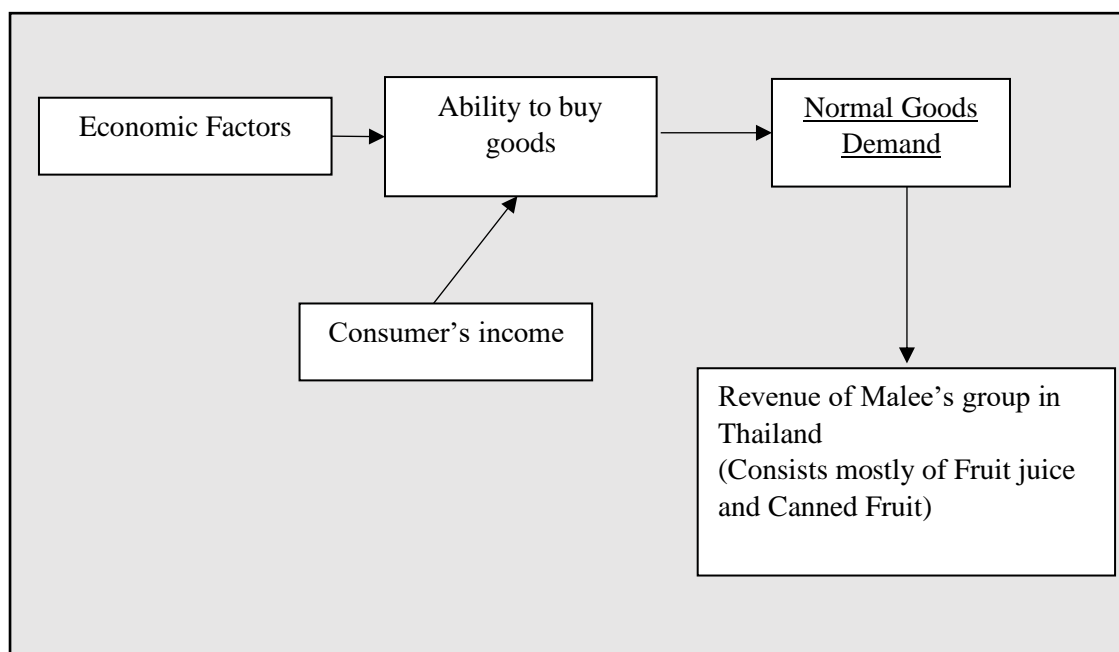
Though the GDP are affected by interest rate and real growth rate. The study shows the growth and interest rates have lag relationships. So, caution is needed when using the following indicators altogether in the regressions. As this may cause a correlation problem in the model during regression model simulation.

“Analysis of provincial data from 1992 to 1999 suggests that while income growth has had a positive effect on poverty reduction, income inequality had a sharply negative effect.”

(DEOLALIKAR, 2003)

This study showing poverty is a threat towards economics which could happened even with income growth but it's also possible that income growth only in some sector may cause poverty and harms the economy. Which in (Hewison, 2013) has also indicated the serious inequality in Thailand that may cause further poverty problem. And later the (World Bank Group, 2017) has confirmed the increase in poverty during 2015 to 2018.

### Conceptual Framework & Theoretical Background



From basic of Macroeconomics where it said that  $Y = C + I + G + NX$   
and also,  $C = (Y - T)$

Where  $Y$  = The economy

$C$  = The consumption

$I$  = Investment

$G$  = Government Spending

$NX$  = Net Export

$T$  = Tax

Assuming the economy itself has is affected back to the demand of Goods and Consumption. And in Income-effect whereas income increase or decrease, there'll be a direct effect on need of goods.

Assuming each economic indicator may have an impact on economy itself ( $Y$ ) assuming, both Gross Domestic Products and Inflation Rate represent as how economy is doing. Whereas Unemployment rate, median wealth per adult and average income per household represent the income which will be included into the equation.

Which data sample are gathered from World Banks, Banks of Thailand, Credit Suisse annual data report, Thailand's National Statistical Office (NSO) and Malee's group quarterly reports. As followed, from 2007-2019 Credit Suisse Annual report, World Bank, Banks of Thailand, and Malee's group annual reports

## Research Methodology

In this study, it is aimed to use the ordinary least squares (OLS) regression to find the effects of each economics factors on the Malee's annual revenues. By using the OLS regression to solve the data gathered to find the relation between Economics indicators and Malee's Revenue which during the simulation using GRETTL.

The Equation in each models using for Regression Simulation will included the variable where GDP and Inflation rate will act as an effects from an Economy while The Unemployment, Median wealth per Adult and Average Income per household represent the income effects on Malee's group revenue.

It may possible that there's a need to eliminate some variable included in the equation to either increase in validation of other variable or reduced the correlated problem between variables. As from (Abdul Aziz Farid Saymeh, 2013) has suggested a possibility in relation between GDP and inflation rate.

### Regression Simulation

#### First Model

In the first Model, it is intended to use the following economics factors to represent the economy, GDP and Inflation rate. And the Unemployment Rate and Median Wealth per Adult are used to represent the income variable. Though the data of Average earning per household has been gathered but the data was collected Bi-yearly, in the first model, it has chose the Median wealth per adult which is going on the same trend with Average earning per household.

Equation will be as followed :

$$Y_i (\text{Malee's group Revenue}) = \beta_0 + \beta_U * (U) + \beta_{GDP} * (\Delta GDP) + \beta_I * (I) + \beta_{Median} * \ln (Median W)$$

Data has been collected from sources as shown in the following Table 1. Which the period of the data using in model 1 are from during 2010-2018. And for using in model 2 are from during 2007-2019.

Variable Type	Variable	Name and Data Sources	Measurement
Dependent Variable	Yi (Malee's Group Revenue)	Internal Revenue, Malee Group Financial report	Million Baht
Independent Variable	U (Unemployment Rate)	Unemployment, Banks of Thailand	Percentage
Independent Variable	GDP (Gross Domestic Product)	GDP, World Bank	Billion USD
Independent Variable	I (Inflation)	Inflation rate, World Bank	Percentage
Independent Variable	Median Wealth per Adult	Median wealth per Adult, Credit Suisse	THB/Person (Will be convert)
Independent Variable	Average Earning per Household	รายได้เฉลี่ยต่อครัวเรือน, Thailand's National Statistical Office	Baht/Month /Household

Table 1 : Variable and Data sources for Model 1 and 2

#### Result for First model

( $\beta$ , P-Value)	Model 1-1	Model 1-2	Model 1-3
Constant	(-33398.5, 0.31)	(-41541.3, 0.21)	(-22667.2, 0.39)
U	(-557070, 0.32)		
GDP	(12.0164, 0.24)	(12.3835, 0.23)	(11.8039, 0.25)
Inflation	(-32777.9, 0.29)	(-32652.2, 0.29)	
Log Median Wealth	(3313.58, 0.24)	(3733.01, 0.19)	(1973.21, 0.36)

Table 2 : Regression result for first regression model

Result from the first model, it is inconclusive as even the exclusion of supposed unrelated variation. Whereas unemployment and Inflation rate has been excluded from the simulation in Model 1-2 and Model 1-3. For an Unemployment rate exclusion is due to previous mentioned from (Bank of Thailand, 2019) statement that it's possible that Unemployment may not be able to describe the real unemployment rate as the reported number of Unemployment rate in Thailand may include discouraged or mismatched workers which maybe the reason where P-Value is highest in model 1-1. While Inflation rate is being excluded in Model 1-3 due to it's couldn't be explain why increase in inflation rate will lead to the lose of Malee's revenue as its revenue supposed to go along with the growth in Economy.

At this point, the study is attempt to move onto the Model 2 assumed the Annual data (2010-2018) is too less to do the Simulation as the it couldn't be confirmed that if any variables are significant or not.

## Second Model

So, in Model 2, will try to expand the data and change the one of the variable in the model to cover more data to see if the result may change in the future or not. Currently the limit is on Credit suisse reports which only limited from 2010 to 2018 which will be changed to NSO's Average earning per household where it's collected Bi-yearly and average the gap between the missing year, after checking with the Average Median wealth per Adult, it's going in the same trend suggest the relationship between each variable.

Changing the variable the data could be extend from 2010 to 2018 into 2007 to 2019 for the second model.

Equation will be as followed :

$$Y_i (\text{Malee's group Revenue}) = \beta_0 + \beta_U * (U) + \beta_{GDP} * (\Delta GDP) + \beta_I * (I) + \beta_{Median} * \ln (\text{Avg. Income})$$

### Result for Second Model

( $\beta$ , P-Value)	Model 2-1	Model 2-2	Model 2-3
Constant	(-96402.6, 0.12)	(-79543.1, 0.04)**	(-44179.0, 0.03)**
U	(73394.1, 0.70)		
GDP	(-7.0551, 0.25)	(-6.4381, 0.25)	
Inflation	(18209.5, 0.25)	(15477.5, 0.24)	(12136.7, 0.35)
Log Avg.Income	(10082.5, 0.11)	(8446.42, 0.04)**	(4697.61, 0.02)**

Table 3 : Regression result for second regression model

Result in second model shown that, according to data from 2007-2019, Average income has an effect on Malee's revenue on the Confidence level of 95% as shown in result from Model 2-2 and Model 2-3. While Unemployment and GDP has been excluded from the Model due to the effects are unexplainable and does not have significance in the model. The Unemployment supposed to have a negative effect on the model as the decrease is unemployment may lead to higher income or wealth, which may increase the Revenue of the Company. However, it has a positive effect which is unexplainable and have to be excluded from the model 2-2 and 2-3. As well as GDP which signal the healthy economics and suppose to show positive effects on the revenue income which in model 2-1 and 2-2, it shown negative effects, so it's needed to exclude from the model and the result is shown in model 2-3.

From this it may be summarized that from the annual data between 2007-2019, there's a significant in Average income per Household that it has a positive effect on the Malee's Revenue by for every 1% increase in Average income per household, the Malee's revenue may increase around 100.82 million baht per year. While for Inflation rate, it's also has positive effects but still inconclusive as the P-value is at 0.35 above the 95% confidence lever P-value at 0.05.

## Conclusions

As result from second model, it could be confirmed that the income effect seems to have a positive relationship towards Malee's group revenue. Which every 1% increase in Average income per household, may increase the Malee's revenue around 100.82 million baht per year. While for another variable it may need more data to be able to confirm the effects it has on Malee's group revenue.

## Recommendation

As the trend of decrease in average income per household is expected to continue in Thailand including the upcoming economic deflation from COVID-19, which recovery may happen slower than expected. So, this study also suggested that the company should start to focus more in export to neighboring countries that may recover sooner than in Thailand as the Malee's revenue is affected by average earning per household which is on the decreasing trend even before the COVID-19 as the said in report by the world bank group. (World Bank Group, 2017).

## Other Findings

1. Further look into difference between Average income per household and Median wealth per adult, though both numbers seem to be on the trends, which maybe substitutable. But it's needed to note that Median wealth per Adult does include other wealth not just income, such as house and other investments are included. While Average income from National Statistical Office's data is per household not per person.
2. In the data collected during 2010-2014, it's seen as though during the unemployment rate in Thailand are on the decreasing trends but the Average income per household are also decreasing, this does explained the Reports from Banks of Thailand concerning about the unemployment rate data. But it's also possible that it may have relations but with delayed effects which may needed to study in the future.
3. As Unemployment rate failed to describe in both models, even though more information is needed. But during data collection, it has also shown that during 2015 to 2018, the data between Unemployment rate and Median wealth per Adult are not going along together. Which addressing the Bank of Thailand concerned of Unemployment rate that may not been able to indicate the real unemployment rate in Thailand. Though this is still inconclusive and need further speculations and study of how much does the discouraged and misplaced workers affected in numbers or there's other effects that caused this to happen.
4. The obstacle found in this study is to obtained an info which is the Average income per household as the Thailand's National Statistical Office released the Public data of Bi-yearly record(Once every 2 years)

which in First model in this study decided to use the Median wealth per adult instead of Average income per household. In which, on second model, use the Average income per household data by average out the missing year.



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