Factors affecting PTT stock price and effects from government policy

Miss Pharisa Chaisuwan

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
Chulalongkorn University
Academic Year 2021

ปัจจัยที่ส่งผลต่อราคาหุ้นปตทและผลกระทบจากนโยบายรัฐบาล

น.ส.ภาริษา ชัยสุวรรณ

สารนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
สาขาวิชาเศรษฐศาสตร์ธุรกิจและการจัดการ สาขาวิชาเศรษฐศาสตร์ธุรกิจและการจัดการ
คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2564

Independent Study Title	Factors affecting PTT stock price and effects from government policy
By	Miss Pharisa Chaisuwan
Field of Study	Business and Managerial Economics
Thesis Advisor	PANUTAT SATCHACHAI

Accepted by the FACULTY OF ECONOMICS, Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of Arts

INDEPENDENT STUDY COMMITTEE

.... Chairman

(SAN SAMPATTAVANIJA)

.... Advisor

(PANUTAT SATCHACHAI)

.... Examiner

(KATIKAR TIPAYALAI)

ภาริษา ชัยสุวรรณ : ปัจจัยที่ส่งผลต่อราคาหุ้นปตทและผลกระทบจากนโยบายรัฐบาล. (Factors affecting PTT stock price and effects from government policy) อ.ที่ปรึกษาหลัก : ภาณุทัต สัชฌะไชย

ปตท. เป็นหนึ่งในบริษัทจดทะเบียนที่สำคัญในตลาดหลักทรัพย์แห่งประเทศไทย และ ปตท. เป็นธุรกิจพลังงานและปิโตรเคมีอันดับหนึ่งของประเทศไทย การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาผลกระทบของปัจจัยทางเศรษฐกิจมหภาคและนโยบายของรัฐบาลที่มีต่อราคาหุ้น ปตท. ส่วนแรกศึกษาปัจจัยเศรษฐกิจมหภาค ได้แก่ อัตราดอกเบี้ย ดัชนีราคาผู้บริโภค อัตราแลกเปลี่ยน และราคาทองคำ โดยใช้ข้อมูลตั้งแต่ปี 2553 ถึง 2563 และทำการศึกษาโดยวิธีกำลังสองน้อยที่สุด (Ordinary Least Square, OLS) ระหว่างราคาหุ้น ปตท. กับตัวแปรทั้งหมด ในส่วนแรก ราคาหุ้นปตท. และดัชนีราคาผู้บริโภคมีความสัมพันธ์เชิงบวก ซึ่งหากดัชนีราคาผู้บริโภคหรือระดับราคาสินค้าและบริการเพิ่มขึ้น ราคาหุ้น ปตท. จะสูงขึ้น ในส่วนของ อัตราดอกเบี้ยและอัตราแลกเปลี่ยนและราคาทองคำมีความสัมพันธ์เชิงลบกับราคาหุ้น ปตท. ซึ่งหมายความว่าหากอัตราดอกเบี้ยหรืออัตราแลกเปลี่ยนหรือราคาทองคำเพิ่มขึ้น ราคาหุ้น ปตท. จะลดลง ส่วนที่สองศึกษาผลกระทบของการลดภาษีเงินได้นิติบุคคลในปี 2555 โดยศึกษาจากผลการดำเนินงานทางการเงิน เช่น ROA, debt to equity, net profit margin, EBITDA และ dividend per share ในระหว่างปี 2552 ถึง 2558 ผลลัพธ์ในส่วนที่สองบ่งชี้ว่ามีหลักฐานไม่เพียงพอที่จะสรุปได้ว่านโยบายมีผลกระทบต่อราคาหุ้นปตท.

สาขาวิชา	เศรษฐศาสตร์ธุรกิจและการจัดการ	ลายมือชื่อนิสิต ....
ปีการศึกษา	2564	ลายมือชื่อ อ.ที่ปรึกษาหลัก ....

6484056829 : MAJOR BUSINESS AND MANAGERIAL ECONOMICS
KEYWORD: stock price, consumer price index, interest rate, government policy, gold price, exchange rate

Pharisa Chaisuwan : Factors affecting PTT stock price and effects from government policy. Advisor: PANUTAT SATCHACHAI

PTT is one of the important listed companies on the Stock Exchange of Thailand, and PTT is Thailand's number one energy and petrochemical business. This study intends to examine the impact of macroeconomics factors and government policy on the PTT stock price. The first part examines the macroeconomic factors, which are interest rate, consumer price index, exchange rate, and gold price, using the data from 2010 to 2020. The ordinary least square between PTT stock price and all variables show that PTT stock price and only consumer price index are positively related. If the consumer price index or price level of goods and services increases, PTT stock price increases. In contrast, interest rate and exchange rate and gold price are negatively related to PTT stock price, which means that if interest rate or exchange rate or gold price increases, PTT stock price decreases and vice versa. The second part examines the impact of the corporate income tax reduction in 2012. However, based on financial performance such as ROA, debt to equity, net profit margin, EBITDA, and dividend from 2009 to 2015, I find insufficient evidence to conclude that the policy impacts the PTT stock price.

Field of Study:	Business and Managerial Economics	Student's Signature ....
Academic Year:	2021	Advisor's Signature ....

ACKNOWLEDGEMENTS

First and foremost, I would like to express my sincere thanks to my advisor, Assistant Professor Panutat Satchachai, Ph.D., for his ongoing support of my study and for his encouragement, tolerance, and guidance throughout this effort. Without the help of my adviser, I could not have done my research.

In addition, I would also want to show my thankfulness to groups for making data accessible. Without such resources, I would not have been able to collect the knowledge and data needed to build this research.

Finally, I would like to express my gratitude to my parents and my friends for all of their help with this research.

Pharisa Chaisuwan

TABLE OF CONTENTS

Page

List of tables

Page

List of figures

CHAPTER 1

Introduction

The global economy in 2022 is gradually recovering from the global health crisis "COVID-19" and over the next three years, the economy is projected to grow by 4% on average from defensive measures and loosen COVID-19 restrictions of many leading countries. Moreover, private investment also supports many economic activities in the service and manufacturing sectors. In addition, the monetary policy normalization by gradually raising the policy rate to reduce the inflationary pressure will lead to an increase in business costs in the future. Recovering in exports sector and entering the investment cycle, private investment in Thailand tends to grow along with the global recovery cycle with the support from manufacturing upgrades to digital transformation.

The Stock Exchange of Thailand has been extremely affected by the pandemic, which resulted in the SET index declining to the lowest point in 2020. After 2 years of the pandemic, at the beginning of 2022, the Stock exchange of Thailand has turned around and has a more positive trend because of many supporting factors with a better COVID-19 situation. International Monetary Fund (IMF) also raises the forecast GDP from 2.9% to 3.1%. Hence, the various better economic outlooks is expected and many stocks are expected to return to their fair value in 2022, especially for the value stock such as energy and banks. This is supported by the economic recovery of many countries and increase in world crude oil price.

Another crucial issue that just has occurred is the 'Russia-Ukrainian War.' Following the Ukrainian Revolution of Dignity in February 2014, the conflict began with a focus on the status of Crimea and the Donbas, both of which are internationally recognized as part of Ukraine. After more than two years of fighting the COVID-19 pandemic, Russia started a large invasion of Ukraine on February 24, 2022. This war has had a significant impact on the global economy, including the global supply chain, and the western boycott of Russia has become an important pressure for economic recovery.

Many economic research institutes have examined how the Ukraine and Russian wars would damage confidence in Thailand's economic recovery. According to KKP (2022), the Thai economy's growth has slowed from 3.9 per cent to 3.2 per cent, implying that the Thai economy will enter an economic stagnation. This can be seen from inflation climbing to 4% while economic growth slows down. The severe boycott has caused global investment to enter a risk-off phase, with investors first limiting their investments in riskier assets. As a result, the price of risky assets has fallen globally. Furthermore, the Thai baht has depreciated from 4% to 3%, and the baht to US dollar hit the lowest level in a 5-year period corresponding to Asian currency such as yen and yuan. As noted by Phubanjerdkul (2022), the Stock Exchange of Thailand has the same impact as the world stock market. This situation has caused the SET to sideway because the stock market around the world has declined, such as Dow Jones was down to 700 points.

That being said, there are many economic factors that change according to the world crisis or the economic situation. Therefore, I would like to know how the economic factor affects the stock market, especially the particular stock that I am heavily interested in and is worthy of examining, PTT stock price. Petroleum Authority of Thailand (PTT) is Thailand’s number one energy and petrochemical business.

In addition, PTT Public Company Limited is Thailand's fully integrated energy company, specializing in exploration, petrochemical manufacturing, and the sale of petroleum and petrochemical goods both domestically and internationally. PTT is listed on the Stock Exchange of Thailand (SET) as well as the SET50; according to Hall (2021), PTT has five distinct advantages over other listed firms:

1.PTT is a member of the Dow Jones Sustainability Indices.

2.A government-owned corporation with the Ministry of Finance as the majority stakeholder.

3.PTT has a wide range of domestic and international customers.

4.Financial strength and competitiveness

5.PTT is Thailand's only entirely natural gas operator.

PTT has a plan to expand its investment portfolio in new business trends in six areas: New Energy Life, Science Mobility & Lifestyle, High-Value Business, Logistics & Infrastructure, and AI & Robotics Digitalization.

Another aspect that I would like to know is the impact of the government policy, which will be an external factor that may also affect the PTT stock price. The stock return also depends on the policy at the period of time. Normally, the government has the capability to change monetary policy (raise and lower the interest rate), which affects the currency and business profit. Moreover, the government can use fiscal policy to subsidise and collect taxes or tariffs. The government policy I have selected is corporate income tax reduction in 2012 from 30% to 20%.

Government thinks that this policy will lower cost for the entrepreneurs, companies or partner and make them more competitive. This corporate income tax rate is closer to the rate of neighbouring countries such as 25% in China and Malaysia, 22% in Vietnam, and 17% in Singapore. According to Muthitacharoen (2019), he finds that both Thai and foreign companies are likely to get tax benefits from this policy. Therefore, I would like to know whether this tax reduction policy would change the price or the return of the PTT or not. To answer this, I will use the PTT financial performance from 2010 to 2015 because this policy can influence the company value and has an effect on the stock price as well (Ibrahim, 2017).

1.1) **The objectives of this study**

1. To examine the macroeconomic factors such as interest rate, consumer price index, exchange rate, and gold price that affect the PTT stock price.
2. To examine the impact of the corporate income tax reduction policy in 2012 on PTT financial performance such as ROA, debt to equity, net profit margin, EBITDA, and dividend.

This study can benefit those are interested in PTT and help them to understand how macroeconomics factors and government policy can affect its price and return.

CHAPTER 2

Literature review

This chapter is separated into 2 parts. The first part will provide the explanation for the economic factors and the linkage between the variables that can affect stock price, and the second part is the literature on the impact of government policy on the stock price.

2.1) The explanation of the factors in the model

The followings are economic variables used to analyze the linkage between macroeconomics variables and stock price in this paper. The first factor is the consumer price index (CPI) which shows the direction of prices and measures the aggregate price level in the economy. The CPI also measures the change in purchasing power of each country. It is considered one of the most important economic indicators. Moreover, economists and policymakers use the CPI to evaluate the pace of inflation.

Increase in inflation lead to the increase in the cost of products and services. This implies that the purchasing power of each unit of currency decreases, which make goods (and stock) become more expensive for consumers since consumers must keep some money on hand for transactions and unanticipated expenses. Inflation ultimately reduces the amount of money used for investing in the stock market and result in declining in the stock price. Some studies noted that inflation affects the stock market differently in the short-run and long-run. In the long run, stocks can serve as a hedge against inflation, which simply means that the value of the stock can appreciate over an inflationary period. When inflation cause rising in input cost, once businesses have had enough time to modify their own pricing in response to inflationary pressure, revenues will increase, and normal profit rates may resume. On the other hand, in the short run, stock prices and inflation have an inversely correlated connection because stock prices are being hampered by declining short-term income and earnings, and a widespread downturn in the economy that creates an unfavourable macroeconomic climate for the stock market and overall consumer spending. (Joubert, 2021)

The interest rate in this paper is considered as the interest rates for a large client’s loans. Interest rate is one of the most important factors because it influences the cost of borrowing, saving return, and total return of investment. Understanding the relationship between interest rate and the stock market can help investors know how change may impact their investment. As noted by Hall (2022), many investors and economists would like to see lower interest rates to stimulate growth and benefit them by lowering corporate borrowing. This will turn into a great profit for the company and can boost the stock value. In contrast, when the interest rate rises, firms and consumers will reduce spending and will result in falling earnings and stock prices.

The exchange rate is a very important guide to the economic health of each country. According to Harchaoui and Tarkhani (2005), the exchange rate affects investment because exchange rate depreciation encourages investment by increasing demands for both domestic and import markets. But it will reduce investment because of the higher cost of imported intermediate goods and cost of capital and vice versa. If the baht strength, foreign investors will withdraw from the Thai stock market and the SET index decreases. At the same time, foreign investors lose money on their foreign exchange when the baht is appreciated. On the other hand, if the baht weaken, the Thai stock market will receive investments from foreign investors, and the stock index will rise. However, foreign investors would benefit from both the strengthening of the Thai baht and rising stock prices.

Talking about the stock market and investment, investor normally wants to gain profit from trading in the stock market, so diversification is an important investment strategy that investors should consider if they want to make a successful investment. Diversification may lower the rate of investment return, but it also reduces the risk associated with the investment. The common strategy is 'Asset Allocation,' in which risk is spread among various assets such as cash, debt instruments, equity instruments, real estate, gold, and oil.

Gold is one of the most important commodities in Thailand, and it is usually considered a safe asset for many investors during turbulent times. As you can see, when economy is uncertain, more people turn to gold instead of stock or other assets because of its enduring value. In the market, there have been some circumstances where the stock markets rise, and gold prices fall. Gold prices may also arise when the stock price falls.

2.2) The literatures that related to the economic factors and stock price

This part provides the literature that related to the economic factors that can affected stock price.

2.2.1 The impact of the economic indicators on the stock price

There are many macroeconomics factors used to analyze the relationship between economics indicator and the stock price, for example, consumer price index, exchange rate, inflation rate, and loan rate, and there are also financial variables in the section such as return on equity, earning per share, dividend yield, book value per share, net profit margin and so on that can explain the stock price. Many papers have shown the relationship between consumer price index. For instance, Chamchuen (2019) analyze the influence of price level or CPI on the CPALL stock price by used the data from 2004 to 2019. These factors including exchange rate, interest rate, gross domestic product (GDP), SET50 index, and dividend are considered and the ordinary least square show that the consumer price index has positive impact on CPALL stock price.

This research is well-matched to Nantwi and Kuwornu (2011) which have a similar result and they investigate the connection between macroeconomic factors such the consumer price index, exchange rate, yield on 91-day Treasury bills, and crude oil price and stock return. The ordinary least square is adopted to investigate the relation of stock market return and those variables using monthly data from 2002 to 2008. They discover that the stock return and consumer price index have a strong enough relationship. The stock return, however, was unaffected by the other factors.

In contrast, there are some papers that have different results. Janpratak, Khunchai, and Bunnun (2020) analyze the economic impact on the Stock Exchange of Thailand in the transportation and logistics sectors. Four economic factors are selected which are the consumer price index, business confidence index, oil price and exchange rate for Baht to US dollar and the data are collected from 2018 to 2019. The multiple regression is adopted to investigate the relationship and the impact. The results show that business confidence index and exchange rate have negative relationship with the Stock Exchange of Thailand, but the oil price has a positive relationship to the Stock Exchange of Thailand, however, the consumer price index is not significant.

Reddy (2012) examines the effect of inflation, interest rate and GDP on the stock market in India from 1997 to 2009. Regression result shows that when interest rate and inflation rate decrease, it leads to increase in stock price. Author also finds that an increase in GDP has a positive effect to the stock price.

Huy and Loan (2020) also investigate the impact of selected factors in the stock price in Vietnam. The selected factors are GDP growth, lending rate, risk free exchange rate, and S&P500. They use the correlation and regression model, and the data from 2014 to 2019. They find that increasing in GDP growth, lending rate, and risk-free exchange rate have positive impact on commercial bank for foreign trade of Vietnam stock price. On the other hand, exchange rate and S&P500 have negative impact on stock price.

Amarasinghe (2015) examines the relationship between interest rate and stock price in Colombo. This paper uses the Granger Causality test and regression to test the relationship between interest rate and all share price index in Colombo stock exchange from 2007 to 2013. The result indicates that interest rate has negative impact on the Colombo share price index.

Sukha and Bancheunvijit (2018) examine the factors that affect the stock price only in the banking sector. The variables are the Stock Exchange of Thailand price index, 3 months fixed deposit interest rate, exchange rate (Baht to US dollar), minimum retail rate, and inflation rate. The reason why the authors use these data set because they think that the stock market index is sensitive to many a variety of factors including fundamental factors and economic factors such as loan interest rate, exchange rate, crude oil price or growth rate on international trade. All of the data are collected from 2013 to 2017 and the result shows that the Stock Exchange of Thailand price index, inflation rate, and Minimum retail rate have a positive impact to the stock price in the bank sector. Only the exchange rate Baht to US dollar has negative impact on the stock price.

Similarly, Rodjanawuttikun (2011) analyzes the factors that may affect banking sector stock by using the ordinary least square between 2005 and 2009. The independent variables are inflation rate, real interest rate, dividend, and the gross domestic product, and the result shows that only the gross domestic product affects banking sector stock price.

Since gold is the alternative asset, gold price is one of the selected factors that I consider to investigate the relationship with the PTT stock price. Bhunia and Mukhuti (2013) examine the influence of domestic gold price on India stock market. They use the unit root and Granger causality tests on the data from January 1991 to August 2012. However, they do not find sufficient evidence to support that relationship between the gold price and Indian stock price exists.

Al-Ameer, Hammad, and Ismail (2018) examine the relationship between the gold price and the Germany stock market called HDAX. The data is collected from August 2004 to September 2016. This paper divides the data into 3 periods: pre-financial crisis, during the financial crisis, and post-financial crisis. They find that there are different correlations in each period. In the pre-crisis, there is a strong positive correlation but finds insignificant results in the second period, while the after-crisis has a negative correlation.

Jain (2016) examines the relationship between gold price, crude oil, USD to Indian Rupee exchange rate and Indian stock price. This paper used the standard, exponential and threshold models, the lead-lag and asymmetric non-linear Causality tests. The result shows that decreasing in the gold price and crude oil price affect the benchmark stock index.

2.2.2 The impact of government policy on the stock price

Ojha (2019) investigates the relationship between the fiscal policy, which is the budget execution and investment management, on the stock index in Nepal. They use the questionnaire survey to collect data from 2003 to 2019 and use the market model to analyze the relationship. They find that the fiscal policy has significantly effect on the Nepal stock index.

This research is well-matched to Wang (2010) which investigate the effect of government policy where it forced firms to adopted an export-oriented strategy when facing limited domestic demand due to its low domestic prosperity and large population base on Chinese stock market over 20 years. The data used come from government statistics bureaus, the central bank, research institutions and some specific capital markets. The author finds that government policies have a positive impact on the Chinese stock market development.

Abebrese, Amporfu, and Sakyi (2016) study the effects of government policies including government expenditure and the government borrowing interest rate, on the stock market development in Ghana from 1991 to 2011. Autoregressive distributed lag is adopted to examine the impact by using income from the government. However, this paper finds that an increase or decrease in expenditure and borrowing interest rate of the government has no effect on the development of the stock market.

Zaremba and Aharon (2021) suggest a different result. They find the government policy that enforces workplace and school closures during the COVID-19 pandemic has a major effect on the world economy and financial markets and stock market liquidity in the COVID-19 period. They use the data from 49 countries from January to April 2020. The result shows that the influences of government policy responses in the narrow area and closing workplaces and schools may restrict the stock market's liquidity.

Thomas (2001) examines the relationship between the government policy, which is the adoption of environmental policy and training of staff in environmental protocols, and higher financial returns to shareholders and the stock return in the United Kingdom. The author uses the questionnaire and the pooled analysis to test the data for 297 companies. The result shows that the policy has a significant relationship with the stock return.

2.2.3 Financial indicators and stock price

Another study from Pongsupatt (2019), he uses the financial indicators such as price-earning (P/E) ratio, dividend yield, leverage, return on equity, book value per share, earnings per share, growth, and net profit after tax to analyze the factors that cause the movement of stock price. He used the financial data from 577 companies listed in the Stock Exchange of Thailand from 2005 to 2014. The multiple regression is used and finds that there are two-way relationships between the stock price and the selected factors. There is positive relationship between earning per share, return on equity, price earnings and net profit on the stock price of the firm, while the dividend yield has the negative relation with the stock price.

CHAPTER 3

Theoretical models

There are two relevant theories that can be used to answer the two objectives which are separates into 2 parts. The first part is the relevant theory that explains how macroeconomics factors affect stock price and the second part is the relevant theory that explains how stock price depends on the financial performance.

3.1) Arbitrage pricing theory (APT)

Arbitrage pricing theory (APT) is a multi-factor asset pricing model that returns on an asset can be predicted using the linear relationship between the expected return on the asset and a variety of macroeconomic parameters that take systematic risk into account. It is a helpful tool for value investors to employ when examining portfolios to find assets that could be momentarily mispriced.

$$\mathrm{E}(R)_i = \mathrm{E}\,(R)_z + \left(\mathrm{E(I)} - \mathrm{E}(R)_z\right) \times \beta_n$$

Where:

$\mathrm{E}(R)_i$	=	Asset expected return
R_z	=	Risk-free rate of return
β_n	=	Asset price sensitivity to macroeconomic factor n
E(I)	=	Risk premium associated with factor i

Because every stock can have unique impacts that affect the return rate, and because the coefficient of beta shows how responsive each element is to change, the factors in APT can be adjusted to explain how each factor affects stock price. APT is more sophisticated than the CAPM, despite being more flexible. Market risk is the sole factor that the CAPM considers, but the APT considers a number of parameters. And figuring out how susceptible a security is to various macroeconomic threats requires a lot of investigation (Hayes, 2020)

3.2) The Gordon growth model (GGM)

The Gordon growth model (GGM) is used to calculate a stock's intrinsic value based on a future sequence of dividends that will increase at a certain pace. The Gordon growth model determines a company's stock price based on the hypothesis that the payments a company makes to its common equity owners would increase steadily over time. Dividends per share, dividend growth rate, and needed rate of return are the three main inputs in the model. The GGM considers the dividend distribution criteria and the market's projected returns when determining the fair value of a company, regardless of the current market conditions. The stock is deemed cheap and is eligible for a purchase if the value determined by the model is higher than the price at which shares are currently trading, and vice versa. (Kindness, 2022)

Dividends per share are the yearly sums that a company pays to the owners of its common stock, whereas dividend growth rate is the percentage increase in dividend per share from one year to the next. There are several techniques investors use to estimate the required rate of return, which is the minimum rate of return they are prepared to accept when purchasing a company's stock.

$$P = \frac{D_1}{r-g}$$

Where:

P	=	Current stock price
g	=	Constant growth rate expected for dividends
r	=	Constant cost of equity capital for the company
D_1	=	Dividend per share for next period

Dividend per share (DPS) is an essential financial indicator for assessing a company's long-term growth potential and financial stability. This equation is used by a company to share earnings to shareholders. Dividend per share may inform an investor about a firm's historical financial health and present financial stability. It can also show how profitable a company is throughout a certain fiscal term. (Nickolas, 2021)

Therefore, when the shareholder gets a high dividend which also a good signal of corporate health and earnings profit to investors. Moreover, when the dividend is high and after the stock dividend declaration, the stock's price often increases because many people want to buy the stock. However, a stock dividend increases the number of shares outstanding while the company's value stays steady, it dilutes the book value per common share, and the stock price is reduced accordingly.

According to the tax reduction policy, it will result in an increase in profit. Therefore, when the company earns high profit, they will enhance the dividend for shareholder then will affect the stock price.

CHAPTER 4

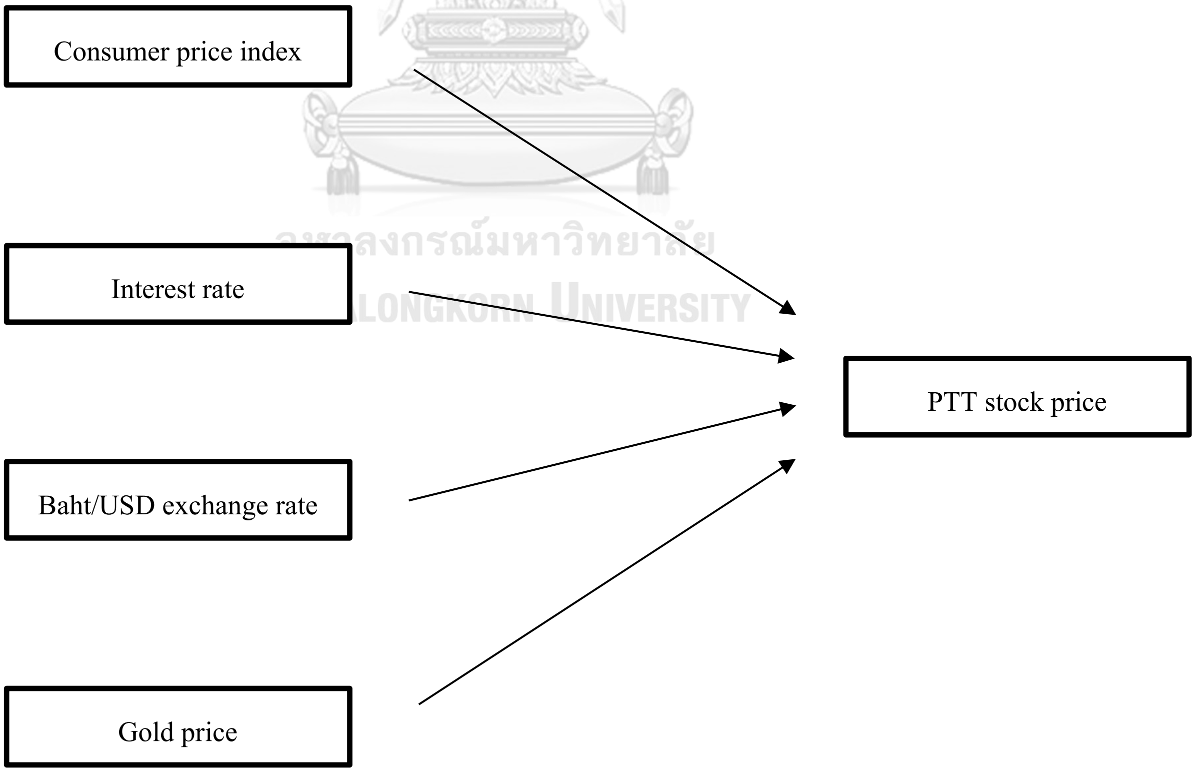
Methodology

This chapter divides into 2 parts. The first part provides the framework in which we use to examine the effect of macroeconomics factor on the PTT stock price. The second part provides the framework that we use to analyze the impact of government policy on PTT stock price

4.1) Conceptual framework

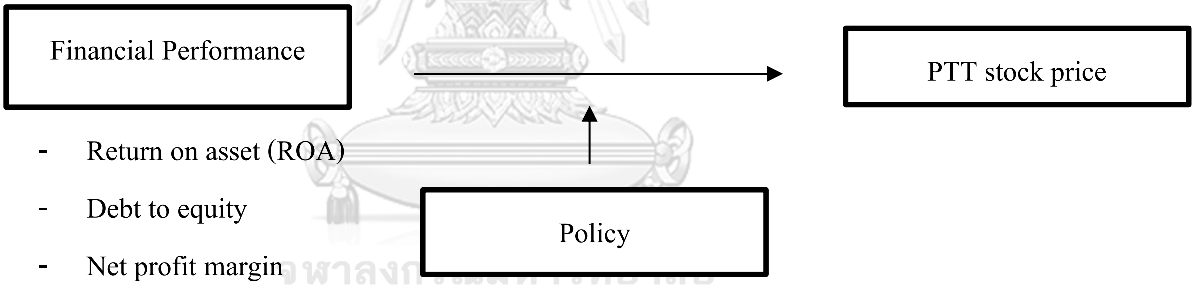
The first objective

Independent variables **Dependent variable**



The conceptual framework for the first objective base on the arbitrage pricing theory, which show that the expected return on an asset may be predicted using a linear relationship between that return and a number of macroeconomic variables that take systematic risk into account. The first one is the consumer price index (CPI) which is considered as inflation, and there is an inverse relationship between inflation and the stock value. The second one is the interest rate, considering the cost of borrowing, so there is an inverse relationship between the interest rate and stock price. The third one is the exchange rate, a country's exported goods become less expensive abroad when its currency is depreciated, which can support growth and possibly enhance profits for businesses that rely on exports and will result in an increase in the company's stock price. The gold price is considered an alternative asset. Theoretically, the price of gold and stock has the opposite relationship.

The second objective



- Return on asset (ROA)
- Debt to equity
- Net profit margin
- EBITDA
- Dividend per share

The conceptual framework for the second objective is if there is a change in government policy that affects firm's profit and revenue, how it will affect stock price. I will analyze impact on the PTT stock price by looking at the company performance, which includes the return on asset (ROA), debt to equity, net profit margin, EBITDA, and dividend per share. This is based on the Gordon growth model, in which the stock price value depends on dividends per share, dividend growth rate, and needed rate of return. Therefore, the change in government policy affects firm's profit and revenue, will affect the dividend per share then lead to affect the stock price.

4.2) Data

1) Economic indicators and PTT stock price

There are 4 economic factors that I have selected which are consumer price index, interest rate, Baht/USD exchange rate, and gold price. The data used is secondary monthly data collected from January 2010 to December 2020; the total of 132 months, from the following sources;

Table 1: Variables sources

Variables	Source
PTT stock price	Investing website
Consumer price index	Economics and Trade Indices Database website
Nominal interest rate (a large client's loans)	Bank of Thailand website
Nominal exchange rate (Baht/USD)	Investing website
Gold price	Gold traders website

Empirical approach

The multiple regression with ordinary least square (OLS) is performed using Gretl. The model is applied from Yansrisirichai and Hongrattanawong (2019) and has been adjusted to fit the PTT stock price. We use logarithmic transformations to make it easier to explain the results and convert a highly skewed variable into one that is more closely to normality.

$$logPTT = B_0 + B_1 logCPI + B_2 logINT + B_3 logEXR + B_4 logGOLD + \mathcal{E}$$

Where:

PTT	=	PTT stock price
CPI	=	Thailand consumer price index

INT	=	Interest rate
EXR	=	Baht/USD exchange rate
GOLD	=	Thailand gold price

To check which macroeconomics factors affects PTT stock price, we test the following hypotheses

$$H_0: B_i = 0$$

$$H_1: B_i \neq 0$$

Where i = each macroeconomic factor, i = 1,2,3,4

If the null is rejected, that macroeconomics factors is significantly affect the stock price. According to the explanation of the factors in the model, the expected coefficients of each variable are:

$$B_1 < 0$$

$$B_2 < 0$$

$$B_3 < 0$$

$$B_4 < 0$$

2) The impact of government policy

The policy that I considered is corporate income tax reduction in 2012, which reduce from 30% to 20%. In this part, I will look at the performance of the company through financial indicators before and after-tax reduction. The financial indicators selected are return on asset (ROA), debt to equity, net profit margin, EBITDA, and dividend per share. All data is collected to calculate from PTT annual report each year from 2009 to 2015, a total of 7 years.

Table 2: Variable definition

Variables	Measurement
Return on asset (ROA)	ROA measure of how much profit company can generating from their capital (ROA = Net income/ total asset)
Debt to equity	Debt to equity measure a company’s financial leverage (Debt to equity = total liability/shareholder’s equity)
Net profit margin	Net profit margin measure how much net profit is produced as a percentage of revenue (Net profit margin = Net income/revenue)
Earnings before interest, taxes, depreciation and amortization (EBITDA)	EBITDA measure a company’s overall financial performance (EBITDA = Net income + Interest + Taxes + Depreciation + Amortization)
Dividend per share	Dividend per share is the amount of a company's paid dividends divided by the number of ordinary shares outstanding. (Dividend per share = Dividend/ number of shares)

The financial performance will explain about the general company’s well-being and also use as a measurement of company’s overall financial health over a given period.

ROA is one of the most important indicators for a corporation as its show how well the company changing the asset into the capital. Many investors use ROA as a tool to find a good stock because this ratio shows how capable company can use its asset to generate profit. A decreasing ROA mean that the company may have trouble or fail to produce revenue growth. In contrast, if ROA rising over time can indicated that the company produces a great profit. This demonstrates that management can make use of all available assets, including both current and fixed assets, and that doing so will raise the company's stock. (Manoppo, 2016)

Debt to equity is a simple indicator that shows the constancy of a company and its potentiality to raise additional capital for growing. From Fernando (2022), Debt to equity can be used to evaluated how much leverage a company is using and high-leverage tend to indicated a company or stock with higher risk to shareholders. So, shareholders should anticipate a profit if leverage boosts earnings by more than the cost of debt, but if the cost of debt rises and more income is created, the stock value may fall.

Net profit margin is one of the crucial aspects of financial health of the company and it helps investors access how the company manage to increase profit from its sale and whether operating cost and overhead cost are being held (Murphy, 2022). Therefore, investors use it to determine if they want to purchase the issuer's stock. It is supported by both the high level of public consumption and rising share income since higher net income encourages investors to buy company stock, which also raises the share price of the company. Company must develop their products to boost net income and sales in order to gain profitability. Therefore, the company may base its choice to acquire shares over its consideration of net profit margin. (Aisyah & Rodoni, 2013)

EBITDA is earning before interest, taxes, depreciation and amortization. EBITDA focuses on the financial outcome of operating decision by eliminating other extraneous impacts such as tax or interest expenses. It also can be used to compare with other company and industry average. Investors can use the EBITDA as a tool to analyze a company's potential as an investment. This may greatly help determine if a company is worthwhile to invest in and at what price.

Dividend per share shows the investors the financial health and long-term growth prospects of company. As noted by Nickolas (2021), a steady or growing dividend payment can be a signal of stability and growth. Moreover, after dividend of the stock was announced, it may increase the stock price close to the dividend per share value. (Sindhu and Bukhari, 2014)

CHAPTER 5

Results

There are 2 parts to the result and each part will answer in different objectives.

5.1) Economic factors and PTT stock price

To first answer the first objective, I check for correlation to test for multicollinearity by performing a correlation test between independent variables(x).

Table 3: Correlation analysis result

	CPI	Interest	exchange rate	gold price
CPI	1			
Interest	-0.2293592	1		
exchange rate	0.24506994	-0.116833	1	
gold price	0.10813818	-0.0484462	-0.3939555	1

According to the table 3, all of the independent variable in the model are slightly correlated. Therefore, using multiple regression would not suffer from multicollinearity problem.

In the multiple regression model, we find the following results in table 4.

Table 4: Regression result

Variable	Coefficients	Standard Error	t-Stat	P-value
Intercept	- 2.039	2.012	- 1.013	0.312
CPI	3.941	0.345	11.41	0.000***
Interest rate	- 0.550	0.146	- 3.763	0.000***
Exchange rate	- 2.061	0.260	- 7.928	0.000***
Gold price	- 0.425	0.112	- 3.771	0.000***

Note: * = at 10% significance level

** = at 5% significance level

*** = at 1% significance level

There are sufficient evidences at a 1% significance level to infer that all the independent variables are significant, which means CPI, interest rate, exchange rate, and gold price are related to the PTT stock price.

According to the expected hypothesis, consumer price index and PTT stock price is expected to have a negative relationship but I find that consumer price index or CPI has a coefficient positive of 3.941. It can infer that for each additional 1 per cent increase in the consumer price index, PTT stock price increase on average by 3.941 per cent. It can be explained that the company can sell the product at a high price while the cost stays the same since the cost of the material can be purchased when the price is low. As a result, when the price of goods rises above their cost, the company's profits likewise rise and stock price will rise (Chamchuen, 2019).

The interest rate has a coefficient equal to – 0.55, and the relationship between interest rate and PTT stock price is negative same as expected, this can be explained as businesses and individuals will cut down on spending as interest rates increase, which will cause earnings and stock prices to decline. It can infer that for each additional 1 per cent of interest rate, the PTT stock price decrease by 0.55 per cent.

The relationship between the exchange rate and PTT stock price is negative as expected. It can infer that for each additional 1 per cent of the exchange rate, the PTT stock price decrease by 2.061 per cent. When the exchange rate depreciation, this leads to an increase in inflation in the future, which makes investors doubt the company's ability to earn higher profit and revenue, which causes the stock price to fall.

The gold price has a coefficient equal to - 0.425, and the relationship between the gold price and PTT stock price is negative same as the expectation. This means if gold price rises, the stock price falls. It can infer that for each additional 1 per cent of the gold price, the PTT stock price decrease by 0.425 per cent.

5.2) The impact of government policy through financial performance

The following result is the impact of the policy corporate income tax reduction in 2012 from 30% to 20% by comparing the financial performance of the company before and after policy implementation. I use the Gordon growth model to infer how change in financial performance affects the stock price.

Table 5: Data descriptive statistics (before and after the policy)

	Before policy		**After policy**	
Variable	Mean	S.D.	Mean	S.D.
ROA	0.065	0.011	0.037	0.024
Debt to equity	1.320	0.118	1.447	0.105
Net profit margin	0.042	0.004	0.025	0.012
EBITDA	173817	34784.755	248235.75	26801.770
Dividend per share	10.583	2.268	11.75	1.5

The result in Table 5 summarizes the descriptive statistics of all financial indicators before the policy after the policy. All the results indicate that the ROA, net profit margin, and dividend per share before the policy are higher than after the policy on average. On the other hand, debt to equity and EBITDA before the policy is lower than when the policy was employed on average.

All selected financial indicators show results from 2009 to 2015 are shown in Table 6.

Table 6: Financial indicators result

Variables	2009	2010	2011	2012	2013	2014	2015
ROA	0.0540	0.0665	0.0758	0.0642	0.0516	0.0248	0.0092
Debt to equity	1.4108	1.1865	1.3641	1.4851	1.4395	1.3071	1.5582
Net profit margin	0.0375	0.0437	0.0438	0.0375	0.0327	0.0214	0.0098
EBITDA	142704	167376	211373	227842	228541	251732	284828
Dividend per share	8.5	10.25	13	13	13	11	10

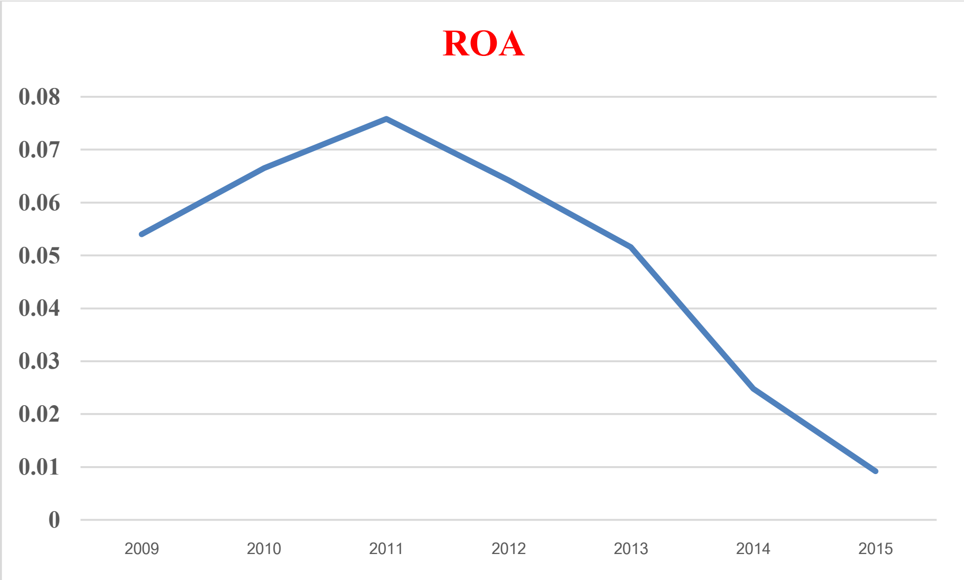


Figure 1: ROA

Although this corporate income tax reduction policy may cause the government to lose income. But this policy will stimulate the economy, and it provides incentive for firm to invest more because the company will get more profit resulting in a growing of the overall economy.

According to Figure 1, the graph illustrates PTT's return on asset or ROA over the 7-year period from 2009 to 2015. As Song (2020) noted that the higher the ROA, the stronger the company's capability to turn assets into a profit. ROA continues to increase from 2009 to 2011, and it peaked in 2011. After that, ROA decline dramatically when the policy is implemented in 2012; it continues to drop and reach a trough in this period. This decline ROA is not expected. This indicates that the efficiency of the company’s operation is improving but after the policy is implemented, the company should get higher profit due to tax reduction but ROA is not rising.

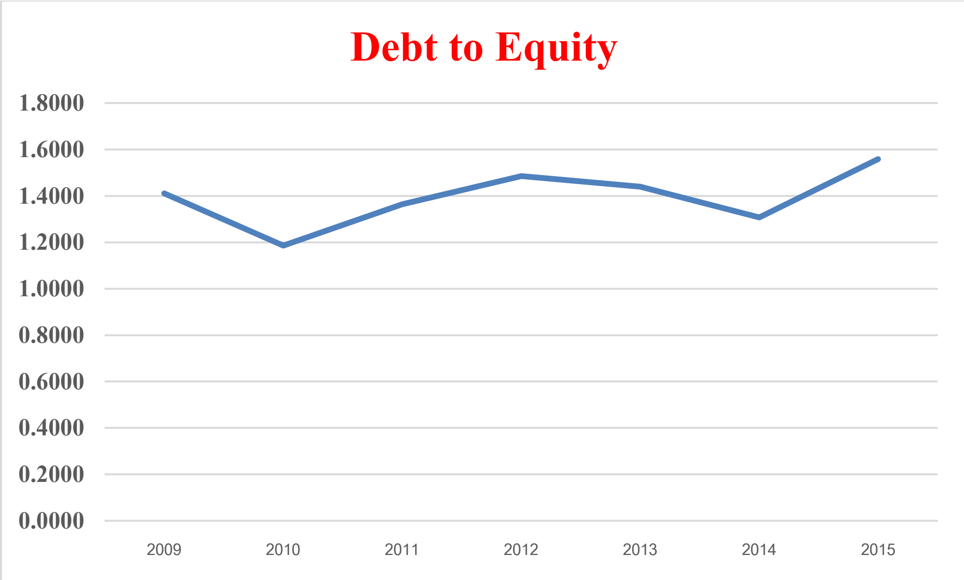


Figure 2: Debt to equity

From Figure 2, Debt to equity ratio determines whether your company has too much debt. It may be used by creditors, lenders, investors, and stakeholders to assess the risk of your company. You're less likely to get loans or attract investors if your risk level is greater. Debt to equity goes up and down moderately in the range from 1.2 to 1.6. Looking more closely at the trend of the graph, debt to equity sharply decline between 2009 to 2010. Meanwhile, debt to equity gradually increases from 2010 to 2012. The policy started, and the trend slightly drop again until 2014. A lower ratio shows a company is less leveraged and is getting closer to being completely funded by equity. Each industry has a different acceptable debt to equity ratio. (CFI team, 2022) However, it increases dramatically in 2014, which can indicate that this is a levered firm.

Figure 3: Net profit margin

Form Figure 3, Net profit margin increases in 2009. This is caused mainly by the investment profit from the subsidiaries and the refining group firms outperforming expectations thanks to greater refining profits. It remains unchanged from 2010 to 2011. In 2011, the Net profit margin decreases gradually, and after the policy was employed for 1 year in 2013, the graph falls sharply. According to the expectation, net profit margin should rise because of tax reduction. However, in this period, PTT reveals that they and their subsidiaries has a decrease in net profit. Part of it may be a result of the loss of the refining and petrochemical group because of the exchange rate due to the depreciation of the Thai baht to the US dollar. Moreover, 2013 was also affected by the shutdown of PTT Global Chemical Public Company Limited's LDPE factory and the accident at PTT's natural gas separation plant. Hence, they have to reduce the production capacity of the petrochemical factory. Therefore, the net profit trend falls sharply until 2015.

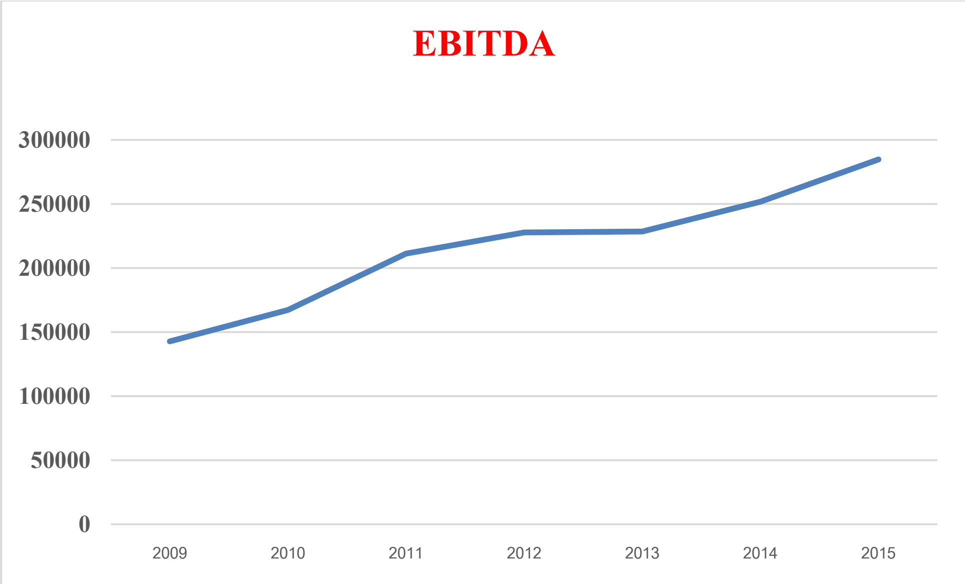


Figure 4: EBITDA

Figure 4 illustrates the EBITDA of PTT from 2009 to 2015. As show in the graph, the trend of EBITDA seems to have an upward trend all in 7-year period. In 2009, EBITDA increase because PTT's profit from the investment in subsidiaries increase by 15%, and at the end of 2011, PTT tried to raise LPG and NGV by following the world market price. However, in 2012 when the tax reduction policy was performed, the graph looked almost unchanged and continues to rise again from 2013 to 2015. The increase in EBITDA in 2013 was largely due to the increase in earnings of PTT exploration and production public company limited and the international trade business unit.

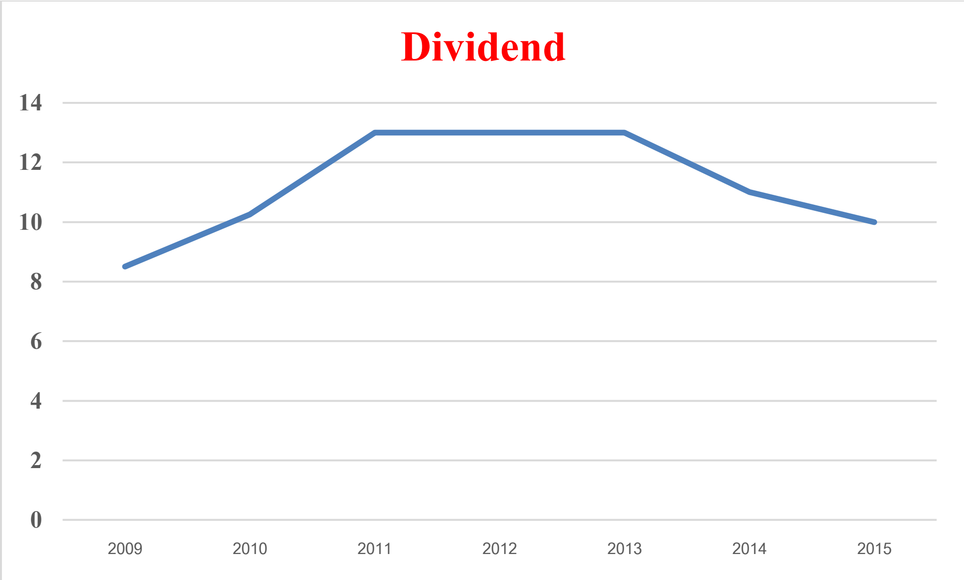


Figure 5: Dividend per share

Figure 5 shows the dividend per share of PTT in the 7-years period. It goes up rapidly from 2009 to 2011. When the policy was employed, the corporate tax was reduced, the dividend should increase because the company could earn higher profit is able to pay a higher proportion of the profit as a dividend to shareholders but this finding shows that the dividend remains stable at 13 per cent from 2011 to 2013, and there is a sudden fall from 2013 to 2015. Furthermore, the downward trend from 2013 to 2015, this might imply that management believes the company's cash flow is insufficient to fund dividend payments (Kelly, 2021).

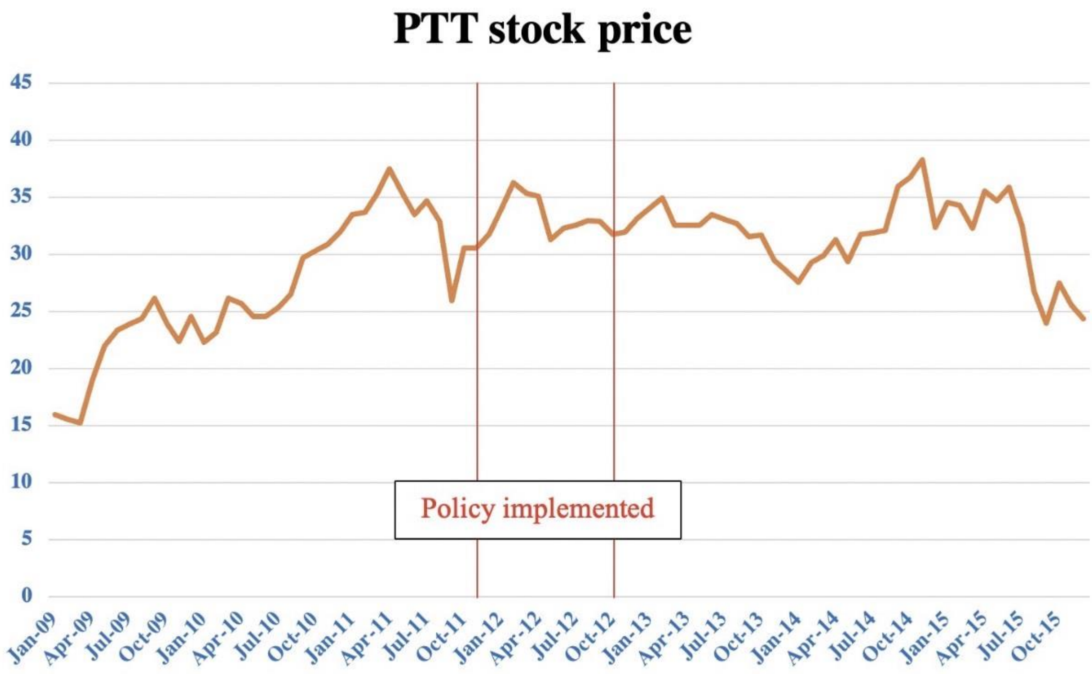


Figure 6: PTT stock price

The second objective of this study is to examine the impact of the government policy on PTT stock price by examining its financial performance. Therefore, Figure 6 shows the PTT stock price monthly in the 7-year period which we can see the movement of PTT stock price before and after policy.

As we can see in the graph, the price fluctuates. When the policy is employed, the expectation price is to go up due to the higher profit from tax reduction. At the beginning of 2012, the policy is employed, price is around 35 baht. After that, the trend go down moderately until the beginning of 2014 and the stock price trend in this period is the same as ROA, debt to equity, and net profit margin in Figure 1,2, and 3, respectively. However, at the beginning of 2014, it rises again to 38 baht. Meanwhile, the trend decreases gradually to 24 baht in 2015. According to the Gordon growth model, the dividend per share can determine the stock value, so from Figure 5 the dividend per share declines from 2014 to 2015 which is same as the stock price trend in the Figure 6.

There are many other factors that may affect the PTT stock price which Hemvachiravarakorn (2019) mentioned that may have effect to the stock price. The first one is economic overview such as finance, politics, society and others in the country and the world. The second one is the investor factor that can drive the stock price especially in small stock or low free-float such as if there are a significant trader buy some small stock often cause the stock price go up. The third one is their company's performance such as revenue and profit that normally have positively related to the stock price. This simply means that if the company has high profit, the stock price tends to go up. Finally, the fourth one is a decline in the major foreign stock market or the trend of foreign stock, especially in the United States.

CHAPTER 6

Conclusion

This paper focus on PTT which is one of an important stock listed in the Stock Exchange of Thailand. This paper analyses the effect on the PTT stock price in two parts. The first part uses the secondary data from 2010 to 2020 to evaluate the 4 factors that may affect the PTT stock price. The result of the first part has shown that PTT stock price and consumer price index are positively related. This simply means that if the consumer price index or price level of goods and services increase, PTT stock price increases and vice versa. In contrast, the remaining three variables are negatively related to PTT stock price, which means that if interest rate or exchange rate or gold price increases, PTT stock price decreases and vice versa.

The second part is to see the effect of corporate income tax reduction in 2012 on the PTT stock price between 2009 and 2015 using the financial indicators, including return on asset (ROA), debt to equity, net profit margin, EBITDA, and dividend per share. Unfortunately, the finding suggests that there is not enough evidence to support that the corporate tax reduction policy has an impact on the PTT stock price because we cannot see the change in PTT company performance. It is possible that there may be some other effects involved in this period that we have to study more.

This paper may give insight into the impact of macroeconomic variables on stock prices as well as the impact of government policy, and this finding will benefit both the company and the investors. While making an investment decision, an investor interested in PTT's stock may use it as a guide in anticipating stock market viability and deciding if it is worthwhile to invest.

Recommendation for the further study

Researcher should add a greater number of data as much as possible just to get a great perspective of the findings and should look at other stocks to see how different economic conditions and policies affect stock prices. Moreover, Researcher should examine the investor's internal factors, such as income or term of investment to foresee all aspects of the investor's internal factor and the uncontrolled external component.

Lastly, researcher should do more about the financial analysis in the government policy part in a technical way.

Limitation of the study

Firstly, the regression model may not have complete variables that may affect the stock price so the omitted variable bias can exist and maybe the further study should have more variables to complete all of the variables and to be more understanding.

Secondly, with data and tools limitations, I can only investigate the impact of the government policy by looking at changes in financial performance, and I think this policy may result in better company performance and increased profit. However, in reality, there are many financial circumstances happened and other factors that should be considered which may affect the movement in the stock price.

REFERENCES

Sukesti, F., & Ghozali, I. (2021). Factors Affecting the Stock Price: The Role of Firm Performance. *Asian Finance, Economics and Business, 8*(2).

Ioannidis, C., & Kontonikas, A. (2006). *Monetary Policy and the Stock Market: Some International evidence.* University of Glasgow, Department of Economics. Glasgow: JEL.

Kvietkauskienė, A., & Plakys, M. (2017). *IMPACT INDICATORS FOR STOCK MARKETS RETURN.* JEL.

Pastor, L., & Veronesi, P. (2012). Uncertainty about Government Policy and Stock Prices. *The Journal of Finance, 67*(4), 1219-1264.

Masum, A. A. (2014). Dividend Policy and Its Impact on Stock Price – A Study on Commercial Banks Listed in Dhaka Stock Exchange. *Global Disclosure of Economics and Business, 3*(1).

Pongsupatt, T. (2019). FACTORS AFFECTING STOCK PRICE: THE CASE OF THAILAND STOCK EXCHANGE SET 100 INDEX. *IISES International Academic Conference*.

Ketvongsa, K. (2013). *Factors affecting the price index of technology industry group stocks.*

Ojha, B. R. (2019). Causal Impact of Government Policy in Stock Market of Nepal. *Management dynamics, 22*(1), 69-78.

Zaremba, A., & Aharon, D. Y. (2021). COVID-19, government policy responses, and stock market liquidity around the world: A note. *Research in International Business and Finance*.

Nantwi, O., & Kuwornu, J. (2011). Analyzing the effect of macroeconomic variables on stock market returns: Evidence from Ghana. *Journal of Economics and International Finance, 3*(11), 605-615.

Abebrese, G., Amporfu, E., & Sakyi, D. (2009). *Do Economic Policy Decisions affect Stock Market Development in Ghana?* Ghana.

Bhunia, A., & Mukhuti, S. (2013). The impact of domestic gold price on stock price indices-An empirical study of Indian stock exchanges. *Universal Journal of Marketing and Business Research, 2*(2), 35-43.

Chamchuen, N. (2019). *The impact of price level on CPALL common stock price.*

Rojanawutthitikun, A. (2011). *The determinants on performance of banking-sector stock.*

Hemvachiravarakorn, N. (2019, 09 04). *Finnomena*. Retrieved from finnomena.com: https://www.finnomena.com/dr-niwes/stock-price-factor/?fbclid=IwAR1HcUttJaSjYnV2CoRPh5BtJjlKLYK40NQ9jCPnPxdxQRj16msZXBIdUzA

Janpratak, P., & Khunchai, W. (2021). Economic Factors Affecting theStock Exchange of Thailand Index: Evidence from Transportation and Logistics Sector. *Journal of Management Science*.

KKP. (2022, 03 16). *Prachachat*. Retrieved from www.prachachat.net: http://www.prachachat.net/finance/news-887622

Huy, D., & Loan, B. (2020). *IMPACT OF SELECTED FACTORS ON STOCK PRICE: A CASE STUDY OF VIETCOMBANK IN VIETNAM.* Vietnam: Entrepreneurship and sustainability center.

Amarasinghe, A. (2015). Dynamic Relationship between Interest Rate and Stock Price: Empirical Evidence from Colombo Stock Exchange. *International Journal of Business and Social Science, 64*, 92-97.

Thomas, A. (2001). CORPORATE ENVIRONMENTAL POLICY AND ABNORMAL STOCK PRICE RETURNS: AN EMPIRICAL INVESTIGATION. *Business Strategy and the Environment*, 125-134.

Yansrisiricahi, S., & Hongrattanawong, L. (2019). *Factors affected the stock price of company Customer Industry in Stock Exchange of Thailand (SET).* Bangkok.

Manoppo, C. P. (2016). *THE INFLUENCE OF ROA, ROE, ROS, AND EPS ON STOCK PRICE.*

Aisyah, S., & Rodoni, A. (2013). *EFFECTS OF NET PROFIT MARGIN, CURRENT RATIO AND DIVIDEND PAYOUT RATIO ON PRICE EARNING RATIO AND PRICE BOOK VALUE.* Jakarta.

VITA

NAME	Pharisa Chaisuwan
DATE OF BIRTH	29 January 1998
PLACE OF BIRTH	Krabi,Thailand
INSTITUTIONS ATTENDED	Prince of Songkla University
	Chulalongkorn university
HOME ADDRESS	3 Prueksautid Road Paknam Krabi Thailand