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The Impact of Second Generation National Health Insurance on Stock Prices- based upon Supplementary Premium Charges on Dividend Income

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Abstract

The purpose of this study is to explore the influences of second generation National Health Insurance (NHI) on the stock prices of listed companies in Taiwan. We employed the Event Study methodology to analyze the impact on listed companies' stock prices during the period

of NHI Act amendment. Moreover, with a seemingly unrelated regression model, we discovered whether or not the new National Health Insurance system exerts different influences on different industries.

The main results are as follows. First, the second generation NHI affects the stock prices of listed companies during the NHI act revision period. Secondly, the second generation NHI has different influences on industries. One possible reason is that the second generation NHI's charges of supplementary premium on dividend income makes investors feel pessimistic about this new insurance policy. This issue alters investment decisions and has a negative influence on Building Material and Construction Industry.

Keywords: National Health Insurance, Second Generation National Health Insurance, Event Study, Seemingly Unrelated Regression.

1. Introduction

Taiwan began the implementation of National Health Insurance (NHI) on March 1, 1995. For the past decade, NHI safeguards all residents' health care rights, becoming one of the influential welfare policies in Taiwan. NHI provides reliable public medical service with reasonable expenses for R.O.C. citizens. Taiwan's NHI system is known all over the world as a successful welfare system.

The misfortune of poverty and sickness often go hand in hand. Since NHI began in Taiwan, family poverty rate decreased from 21.90% to 20.30%. In addition, the average life expectancy has increased to 80 years of age, according to data from theUnited Daily News(Chiang, 2014).

The NHI is a compulsory social insurance program run by the government. Through NHI, citizens enjoy complete medical care, including clinic visits, hospitalization, home nursing care, and rehabilitation services. One important advantage in implementing NHI is that through risk-sharing, the average citizen significantly reduces his or her financial burden due to medical needs. Hence, surveys show that citizens in Taiwan are highly satisfied with NHI. However, NHI is a non-profit social insurance system, so financial support for the continuance of NHI has become a main issue.

The fact that NHI is inexpensive and convenient has, unfortunately, led to wasteful use of medical resources. The lowering of itemized payments to hospitals also drove many medical practitioners to prefer cosmetic medical service over traditional medicine, with the number of plastic surgeons increasing by 190% (Peng, 2014). NHI supplementary premium charges based on income from part-time jobs, business income, dividend income, interest income and rental income have sprouted many fee-avoidance measures. Such measures include false reporting of salary levels from high to low, changing to short-term investments for returns below the threshold where additional premium would kick in, fund splitting for savings accounts, and transfer of additional premium charges to employees. Past NHI studies tend to explore the regulations and the issue of fairness. After implementation, social policies or systems usually become political issues (Skocpol and Amenta, 1986). Therefore the amendment of NHI inevitability leads to different reactions from the stakeholders.

The premium income is paid by the insured, group insurance applicants, and the government. However, like other developed countries such as France or Germany with NHI systems, in recent years health care costs have risen significantly due to increasing elderly population, home nursing care, rehabilitation and new expensive medical technologies. If premium income is not adjusted high enough, it is not able to cover medical expenses fully. According to the Ministry of Health and Welfare's December 20, 2012 statistics, the 2011 insurance income (includes premium income and other income) totaling NT$4,968 million, however, over the past 10 years, the ratio of premium income to insurance income has decreased 5.3% from 99.8% to 94.5%, shown as Figure 1.

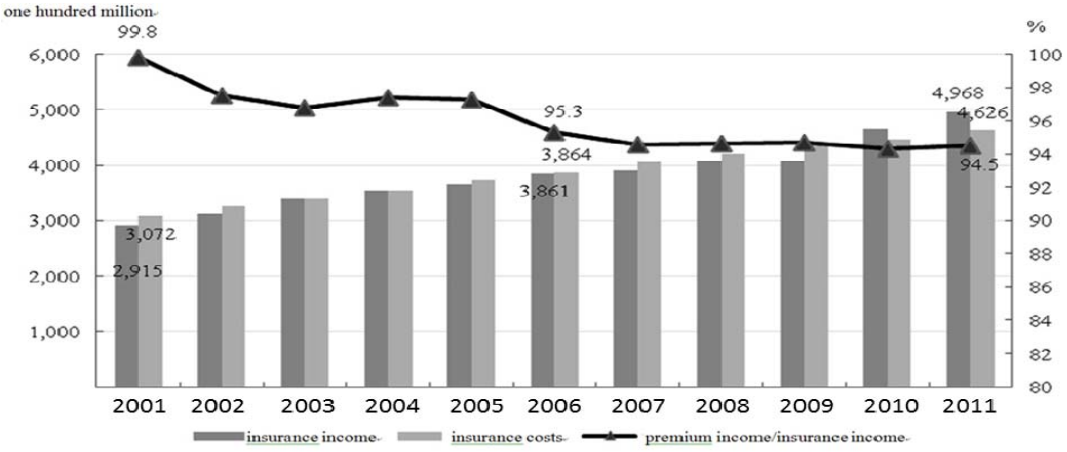

Fig. 1. Financial Income and Cost of NHI from 2001 to 2011

On October 30 of 2012, the Ministry of Health and Welfare finalized regulation for supplementary premium, which includes charges based on bonuses, income from salaries and wages, income from professional practice, dividend income, income from interest and income from lease. The NHI revision, effective starting on January 1, 2013, is known as the second generation NHI.

The purpose of the revision is to support the continuance of the NHI social welfare system for the benefit of all residents. However, the second generation NHI's new premium contribution requirements have had some negative impact. For example, investment institutions consider supplementary premium charges on dividend income as a negative factor for the stock market. New policies decrease stockholders' real dividend income after deduction of necessary supplementary premium. Hence, the investors are reluctant to participate in dividend distribution, which leads to declining stock prices.

Many researches already demonstrate how government policies affect the stock prices. For example, the operation of the stock market is dependent not only on market mechanism but also on governmental policies (Ju, 2007).There are crucial relationships between the stock market and governmental policies (Kaustia and Torstila, 2011).

The formation of a healthcare system involves a wide range of issues such as fairness and justice. Given that the stock market is the nation's economic showcase, the current lack of research on the effects of NHI on the stock market has prompted this study, which investigates the NHI's policy of premium charges based on dividend income and its effects on the stock market. Through the results of this study, hopefully the public will view NHI from a positive perspective. This study can also serve as reference for future development of governmental policies.

The remainder of the study is organized as follows. Section 2 introduces NHI and related literature. Section 3 presents the research methodology, while Section 4 lists and interprets this study's empirical results. Finally, Section 5 summarizes conclusions and provides a discussion of the implications.

2. Related Literature

This study discusses the influence of the second generation NHI on the stock market. The differences between the NHI and the second generation NHI, and the core value of the second generation NHI are described below.

2.1 Major changes in the second generation NHI

The original NHI program satisfied the needs of most people, but suffered from financial problems. Therefore, the second generation NHI proposal considered national, social, political and economic factors. Major changes in the second generation NHI are as followings.

2.1.1 Single supervisory committee

For the sustainability of the second generation NHI, two organizations, the NHI Supervisory Committee and the NHI Medical Expenditure Negotiation Committee were merged into a single Supervisory Committee to strengthen the financial mechanism. The supervisory committee is responsible for the financial balance sheet of the second generation NHI.

2.1.2 Extended premium base

To extend the premium calculation base, the premium of the second generation NHI includes "general premium" and "supplemental premium". Based upon the principles of fairness, supplemental premium regulation levies charges on other relevant income sources.

2.1.3. More information exposure of healthcare quality

Improving healthcare quality is one of the most important missions of the second generation NHI. Therefore, large medical care institutions are required to provide NHI-related financial reports, to disclose information on healthcare quality.

2.1.4. Other

To prevent overseas citizens from using medical resources without adequate contribution, they would need to wait four months before entering the NHI program again if they failed to pay premiums for a long time. However, if overseas citizens have insurance records within the last two years, they are still under the protection of the second generation NHI.

There are three core perspectives for the second generation NHI. They are "Constructing an NHI organizational system that is accountable," "Expanding diversified social participation," "Balancing finances and increasing service-purchasing efficiency," and "Strengthening the provision of information to enhance medical care quality." Besides, the core value of the second generation NHI are "quality," "fairness," and "efficiency," shown in Figure 2.

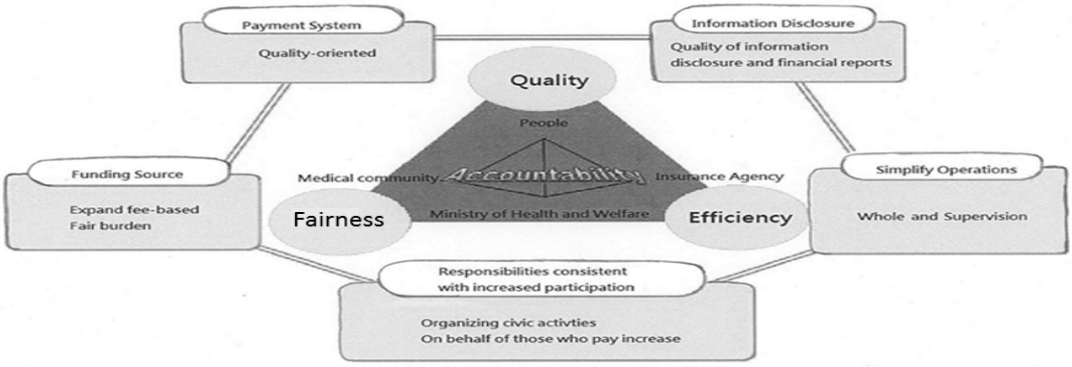

Fig. 2. Core value of the second generation NHI

2.2 The influence of the second generation NHI on the stock market

This study intends to discuss the impact of the second generation NHI on the stock market.

2.2.1 Impact on businesses

The second generation NHI supplementary premium, paid by employers, should be based on the difference between the total monthly salary payment and the total premium ratable wage basis. Most importantly, there is no upper limit for supplementary premium. Therefore, companies with high bonuses pay much more supplementary premiums than those with low bonuses. The illustration is shown as Table 1.

Table 1. Illustration of premium differences between NHI and the second generation (NT dollars)

	Premium of NHI (Premium rate = 5.17%) (1)	Premium of the second generation NHI			Differences (5)=(4)-(1)
		General (Premium rate = 4.91%) (2)	Supplemental (Premium rate = 2%) (3)	Total (4)=(2)+(3)	
Company without bonus: Company A ● with 500 employees the monthly average premium ratable wage base is NT $ 30,300 for one employee ●without any additional bonuses	NT $30,300 × 5.17% × 0.6 × 1.7 × 500 = NT $799,000	NT $30,300× 4.91% × 0.6 × 1.7 × 500 =NT $758,500	(NT $30,300 × 500 - NT $30,300× 500) ×2% =NT$0	NT $758,500	- NT $40,500
High bonus company: Company B ● with 200 employees the monthly average premium ratable wage base is NT $ 18,300 for one employee ●the total employees' monthly salary is NT $ 5,000,000	NT $18,300 × 5.17% × 0.6×1.7×200 = NT $193,000	NT $18,300 × 4.91% × 0.6×1.7×200 =NT $183,400	(NT $5,000,000 - NT $ 18,300× 200) × 2% = NT $26,800	NT $210,800	NT $17,200

Table 1 shows how premiums are calculated and supplementary premium differences based on different salary structures. Under the second generation NHI, total premiums paid by

companies without bonuses are less than before, while premiums paid by companies with high bonus expenditures are higher than before.

2.2.2 Impact on investors

The impact on ordinary investors is much greater than the impact on major shareholders. Based upon the premium calculation principles of the second generation NHI, when the dividend income is less than NT$5,000, there is no supplementary premium. When the dividend income is more than NT$5,000 but less than NT$10 million, the supplementary premium rate is 2%. When the dividend income is more than NT$10 million, the supplementary premium is the same amount as a NT$10 million income - that is, NT$200,000 is the upper limit for supplementary premium. More favorably, institutional investors do not have to pay any supplementary premium. Therefore, the impact of the second generation NHI on major shareholders is smaller than ordinary investors.

The research manager of Capital Securities Corp (CSC) stated that investors are less willing to participate in earnings distribution after the implementation of the second generation NHI(Zeng, 2011).The closer to the implementation date, the stronger negative attitudes showed. Moreover, the implementation of the second generation NHI encourages short-term investment behavior, which leads to greater fluctuation of the stock market.

In summary, the NHI is not only a social insurance, it also serves as protection of citizens' rights for medical care. For fairness sake, it is necessary to extend the premium calculation base. However, such new policy disturbs investment behavior and decreases participation in the stock market.

2.2.3 Event Study

An Event Study explores whether or not a particular event would cause the fluctuation of stock prices and result in abnormal returns (Shen and Lee, 2000).This methodology is very good at measuring the effects of a new event on stock prices. It can also be used to estimate whether abnormal returns happen before or after an event. An abnormal return is the difference between the realized return and the expected return(Brown and Warner, 1980).There are four steps to applying the Event Study: first, determine the date of the event; second, estimate the abnormal return; third, examine the abnormal return; and finally, analyze the results (Shen and Lee, 2000).

Event Study is one of the most widely used research methods in business studies (Chan, Martin and Kensinger, 1990; Doukas and Switzer, 1992; Kelm, Narayanan and Pinches, 1995).Event Study investigates the influence on stock prices after an announcement of accounting earnings(Ball and Brown, 1968).

Event Study is also employed on some public policies, such as formulation and changes of Securities and Exchange Act, and Anti-trust and tax laws. For example, from 1907 to 1920, the United States began to control electricity price in 32 states. Scholars used the Event Study method to discuss how the policies influenced power companies (Stigler and Friedland, 1962).Another research analyzed 205 cases of antitrust litigation charged by the U.S. Asset

Forfeiture Program or the Federal Trade Commission from 1950 to 1971. There was no significant effect on the companies' stock prices before and after the litigations (Ellert, 1976).

The prosecuted companies that violated the Securities Exchange Act enacted in 1934 were charged because they released false financial statements, which led to investors' losses. Furthermore, researchers found that when the company's accounting deficiencies was discovered and publicized, the market value decreased by one billion U.S. dollars)(Kellogg, 1984).

Researcher also studied 50 companies affected by the sugar tariff reform in 1912. The biggest effect of the reform was the date when the news was released by the Senate and the President, and not when the reform was being discussed earlier(Ellison and Mullin, 1995).In addition, investigators studied the impact of Land Appreciation Tax (LAT) deduction on companies. They found that the policy stimulated the real estate market and had significant influences on the stock prices (Wang, Chen and Lin, 2005).All the above studies explored whether policies affected companies by using the Event Study methodology.

As shown in the above literature, the Event Study can be also help to investigate a particular event occurrence, whether the RMB exchange rate was affected(Liu and Pauwels, 2012);whether the EU sovereign bond yields were affected(Afonso, Furceri and Gomes, 2012);and whether the asset prices were affected(Vithessonthi and Tongurai, 2012).Moreover, some investigators also studied how investors' sentiments affect the stock prices on the date of compulsory acquisition(Okoń,2012; Schijven and Hitt, 2012).There are many such studies discussing the influence of public policies on stock prices. Using the Event Study method, this study will explore stock price fluctuations due to related governmental policies.

2.2.4 Seemingly unrelated model

The Seemingly Unrelated Regression (SUR) is the system of equations which can deal with both cross-sectional and time series data (Zellner, 1962).When employing the Event Study, we consider the data as cross-sectional independent, except in the case of event clustering. There are three types of event clustering. Event calendar clustering means several event dates are the same calendar date or very closely together. Industry clustering is that sampling firms are almost in the same industry, while risk clustering is that such events have influences on companies with similar risk levels (Shen and Lee, 2000).

Researchers found that event clustering would increase the variances of abnormal returns, thus affecting the accuracy of results(Brown and Warner, 1985).Non-synchronous trading, event calendar clustering or industry clustering, whichever happens, the results of Event Study would be not persuadable(Henderson, 1990).The scholars also found that stock returns of companies in the same industry were related during the same time period (Schwert, 1981).Besides, one academic researcher employed both Event Study and SUR to discover the impact of policy reforms on stock returns(Binder, 1985).

This study analyzes the impact of the amendment and implementation of the second generation NHI on stock returns. Since some event dates are close to others, to avoid cross-sectional dependency resulting from event clustering, we employ two methodologies, namely Event

Study method and SUR, to discuss the issue.

2.2.5 Hypothesis

The second generation NHI is the social welfare system which may benefit the people in Taiwan. The second generation NHI reform would have great impact on people and firms. Furthermore, the second generation NHI charges supplementary premium based on dividend income – it is estimated that about 1 million investors were affected when the policy took effect. For roughly one ninth of the investors, the realized dividend income would decrease by 2% because of supplementary premiums. The investors are then less likely to actively participate in the firms' dividend distribution, thereby influencing stock prices.

Scholars found that the investors' participation of the stock market was closely related to the policy reforms (Kaustia and Torstila, 2011).Academics also discovered that there is a strong relationship between the political event and the stock returns(Kim, Pantzalis and chul Park, 2012).Thus, we propose Hypothesis1 as follows:

Hypothesis H_1: The second generation NHI influences the stock prices.

Next, this study focuses on the issue of supplementary premium charges from dividend income. Also, people with different salary structures are affected by the second generation NHI in different ways. Some companies pay higher fixed salaries with lower amount of bonuses, while others pay lower fixed salaries with higher bonuses. The impact of supplementary premiums on companies and people would be different. Thus Hypothesis 2 is:

HypothesisH_2: The second generation NHI amendment has different impact on different industries.

3. Methods

Using the Event Study method(Duchin and Sosyura, 2012)and the SUR(Zellner,1962)during the period of amendment and implementation of the second generation NHI Act, this research explores the impact of the second generation NHI Act on the stock prices of Taiwan's listed companies. The data and methodologies are as follows.

3.1 Data and sample

This study seeks to discover the impact of the second generation NHI Act on stock returns. All stock returns are listed in daily frequency, with data from the Taiwan Economic Journal (TEJ). There are sample companies in total and they are from the TAIEX (Taiwan Stock Exchange). All listed companies are included, except full-cash delivery and missing-data stocks.

3.2 The Event Study

3.2.1 Event Day

Event Day refers to the date when the market received relevant information about the event. In the United States scholars choose Event Day when the information is delivered to the market by Wall Street Journal. However, there is no benchmark media in Taiwan like the Wall

Street Journal, so most studies choose the information announcement date as Event Day. This research followed the studies(Liao, 2009; Zang, 2011)and chose Event Day as the announcement dates when the first, second and the third readings of the second generation NHI Act passed. Events 1, 2, and 3 are the passing dates of the first, second and the third readings of the second generation NHI Act, respectively. Event 4 is the day when the government announced the draft of Supplementary Premiums Act. Finally, Event 5 is the day of decree for the Supplementary Premiums Act.

3.2.2 Event Period

For daily frequency data, Event Period could be 2 to 21 days (Shen and Lee, 2000).Scholars explored the impact of political pressure on the changes of the RMB exchange rate. They selected seven days as Event Period, mainly due to the risk of overlapping events. The shorter the period, the lower the risk of overlapping (Liu and Pauwels, 2012).Therefore, this study also selected seven days as the Event Study period. Event Period starts from three-days-before Event Day up to three-days-after Event Day.

3.2.3 Estimation period

The estimation period is a period which can establish the expected model for the estimation of the expected stock returns (Shen and Lee, 2000).Scholars suggested that the estimation period should be set before Event Period(Peterson, 1989).The length of the estimation period could depend on the objective of the studies. However, if the estimation period is too short, the efficiency of the model may be undermined; if it is too long, the instability of the model may occur due to structural changes within the period. Academics have suggested that the estimation period should be anywhere from 100 to 300 days for daily data (Shen and Lee, 2000).For this study, the estimation period is set as 200 trading days before Event Day. Since Event 2 and 3 are close to each other, to avoid the overlapping of estimation period 2 and estimation period 3, we set the estimation period of Event 2 and 3 in the same period by following the scholars' studies (Liao, 2009; Zang, 2011).In this study, we also take the market model to estimate the abnormal returns of Event Period. Table 2 is the summary of Event Day, Event Period, and estimation period.

Table 2. Summary of Event Day, Event Period, and estimation period

Event	Event Day	The relevant events of the amendment and announcement of the second generation NHI	Event Period	Estimated period
1	2010.4.16 (Fri)	The first reading of the second generation NHI Act was accomplished and sent to the Social Welfare and Environmental Hygiene Committee of the Legislative Yuan to review.	2010.4.13(Tue) ~ 2010.4.21(Wed)	2009.6.26(Fri) ~ 2010.4.12(Mon)
2	2010.12.7 (Tue)	The second generation NHI Act entered the second reading NHI Act.	2010.12.1(Wed) ~ 2010.12.10(Fri)	2010.2.11(Thu) ~ 2010.11.30(Tue)
3	2011.1.4 (Tue)	The second generation NHI Act entered the third reading NHI Act.	2010.12.30(Thu) ~ 2011.1.7(Fri)	2010.2.11(Thu) ~ 2010.11.30(Tue)
4	2012.5.7 (Mon)	The Department of Health published the draft of “Regulations Governing the Deduction and Payment of the Supplementary Insurance Premium of the National Health Insurance” and is going to implement on January 1, 2013.	2012.5.2(Wed) ~ 2012.5.10(Thu)	2011.7.14(Thu) ~ 2012.4.30(Mon)
5	2012.10.30 (Tue)	No. 1012600179 Decree of the Department of Health announced “Regulations Governing the Deduction and Payment of the Supplementary Insurance Premium of the National Health Insurance” and is going to implement on January 1, 2013.	2012.10.25(Thu) ~ 2012.11.5(Mon)	2012.1.6(Fri) ~ 2012.10.24(Wed)

3.3 Seemingly unrelated model

Researchers employed the SUR model to discuss the effect of the decree reform on the stock market (Binder, 1985).The SUR model can avoid cross-sectional dependence resulting from event clustering and can also analyze the effect of a particular event on different industries. However, while there are more than 15 SUR model equations, higher statistical errors could result (Schwert, 1981).Hence this study chooses six industries from TAIEX, to analyze whether or not different industries are impacted differently by the second generation NHI supplementary premium charges based on dividend income. The industries chosen include

Plastic, Building Material and Construction, Finance and Insurance, Chemical and Biotechnology, Electronics, and Others. These are the top six industries with higher proportion of turnover in TAIEX.

The model specification is as follows:

$$R_{pt}=\alpha_p+B_pR_{mt}+\sum_{\tau=t_3}^{t_4}\gamma_{pt}D_\tau+\varepsilon_{pt}$$

R_{pt} the stock returns for p industry at period t · p=1,….6, t=-203,……,+3,

R_{mt} the market returns at period t,

α_p,β_p Intercept and regression coefficient of p industry,

D_τ dummyvariable, when Event Period occurs, D_τ=1; otherwise, D_τ=0,

γ_{pt} the regression coefficient of Event Period occur for p industry p at period t,

ε_{pt} the residual

4. Results

This section reveals the empirical results of this study. The first is the impact of the second generation NHI Act on the stock returns. The second is whether the second generation NHI Act exerts different influences on different industries.

3.4 Impact of the second generation NHI Act on the stock returns

Table 3 shows the impact of the second generation NHI Act on the stock returns according to the Event Study. There are a total of 741 sample companies. Event Days are the dates when the first, second and the third readings of the second generation NHI Act passed, the announcement date of the Supplementary Premiums draft, and the date of decree for the Supplementary Premiums Act.

For Event Period 1, it is possible to find stock market's response after the Legislature passed the first reading of the second generation NHI Act. From Table 3, on the three-days-before Event Day, the average abnormal return and the cumulative average abnormal return are not significant for both the cross-sectional statistics and the standardized cross-sectional statistics. On the two-days-before Event Day, both the average abnormal return and the cumulative average abnormal return show positive results at 1% significance level. On the one-day-before Event Day, only the cumulative average abnormal return shows significant positive results, while the average abnormal return does not.

In sum, before the first reading of the second generation NHI Act passage date, most investors were not familiar with the second generation NHI. Since investors did not have enough information about the second generation NHI proposal, they did not really understand how the new regulation would affect them and the stock market. Hence, the results would not

be consistent.

On Event Day 1, the average abnormal return and the cumulative average abnormal return are all positive at 1% significance level. Investors were optimistic about the second generation NHI, since the NHI reform would benefit more people in the society. On the one-day-after Event Day, the average abnormal return and the cumulative average abnormal return also show significant results but now on the negative side. On the two-days-after Event Day, the average abnormal return shows significant negative results. However, the negative average abnormal return becomes smaller, so the negative cumulative average abnormal return becomes smaller and does not show statistical significance. On the three-days-after Event Day, only the average abnormal return shows significant results but it turns into apositive number. To sum up, all the results of event 1 imply that investors did not get information about the second generation NHI when the first reading passed. Hence, for Event Period 1, the results do not show consistent responses.

For Event Period 2, the effects on the stock market when the Legislative Yuan passed the second reading of the second generation NHI Act may be found. In Table 3,the average abnormal return and the cumulative average abnormal return on the three-days-before, two-days-before as well as one-day-before Event Dayarealmost all significant with both the cross-sectional statistics and the standardized cross-sectional statistics. Besides, all significant results are negative and nearly at 1% significance level. In summary, before the second reading of the second generation NHI Act passage date, most investors were getting familiar with the second generation NHI and the results reveal that the new regulation had negative impact on the stock market.

However, on Event Day 2, one-day-after, two-days-after as well as three-days-after Event Day, the average abnormal returns become positive and significant. Thus, the cumulative average abnormal returns become larger, going from negative to positive numbers. In the short run, all investors and firms would pay more premiums, therefore their real income would decline. But the new premium system would support the second generation NHI program and benefit everyone in the society in the long run. These negative to positive results imply that people gained a better understanding of the advantages of the second generation NHI.

Event Day 3 is the day when the third reading of the second generation NHI Act passed. Table 3 shows the average abnormal return is significantly negative only on the three-days-before Event Day. The average abnormal returns show positive and significant results on other days, including one-day-before, one-day-after as well as two-days-after Event Day. Since the average abnormal returns are from negative to positive at the significance level, the cumulative average abnormal returns also become positive after Event Day. The results of Event Period 3 are consistent with the arguments of Event Period 2. Even though people felt losses in the beginning because the second generation NHI asks for more premium, they come to realize that medical cost will decrease, and in the end most people would benefit.

For Event Period 4, the stock market responses about the draft of the Supplementary

Premiums Act may be found. In Table 3, on the three-days-before Event Day, the average abnormal return and the cumulative average abnormal return are significant for both cross-sectional statistics and the standardized cross-sectional statistics. On the two-days-before Event Day, only the cumulative average abnormal return shows a positive number at 1% significance level. On the one-day-before Event Day, the average abnormal return and the cumulative average abnormal return show significantly positive results. On Event Day and one-day-after Event Day, the average abnormal return and the cumulative average abnormal return also show significant positive results. On the two-days-after Event Day, the cumulative average abnormal return shows significant positive results, but the average abnormal return does not. However, on the three-days-after Event Day, the average abnormal return and the cumulative average abnormal return show significant results, with the average abnormal return turning into a negative number.

The stock market response on the announcement of the Supplementary Premiums draft regulation goes from positive to negative. One possible reason is that people learned of the benefits of the second generation NHI, so the results show consistently positive numbers before Event Day 4. However, after the detail of the Supplementary Premiums Act was announced, investors began to understand that the main source of supplementary premium would come from charges based on dividends. Each dividend income above NT$5,000 should be charged a 2% supplementary premium contribution. Millions of investors would be affected by the Supplementary Premiums Act, when their realized dividend income would decrease by 2%. Thus, when investors became fully aware of the detail of the proposed regulation, they exhibited a pessimistic attitude toward the Supplementary Premiums Act. The result of Event Period 4, therefore, goes from positive to negative.

Event Day 5 is the decreed date of the Supplementary Premiums Act. In Table 3, one can find the average abnormal returns and the cumulative average abnormal returns before Event Day 5, which all show significantly negative results at 1% significance level. These negative results are consistent with the arguments above. People showed pessimistic attitude toward the supplementary premiums charges based on dividend income. However, on Event Day 5 and two-days-after Event Day, the average abnormal returns are both positive at 1% significance level. The average abnormal return of three-days-after Event Day turns to be significantly negative. Plus,the cumulative average abnormal returns are all significantly negative.

At first people responded negatively to supplementary premium charges on dividend income because the new regulation decreases investors' gains. Furthermore, after the Supplementary Premiums Act is decreed, people understood that the new regulation could no longer be postponed or changed. Therefore, investors adjusted their thinking to try and be more rational. After all, the Supplementary Premiums Act supports the financial framework of the second generation NHI and increases social benefits. That is the reason why on the decree date and afterwards, the average abnormal returns became positive again. In addition, on three-days-after Event Day, the average abnormal return becomes negative. It is consistent with the argument that people try to agree with Supplementary Premiums Act from the viewpoint of social welfare. In fact, investors suffer losses due to the supplementary premium

charges, and they do not change attitudes totally in a short period. Hence, the average abnormal return of three-days-after Event Day is significantly negative. The fact that the cumulative average abnormal returns of Event Period 5 are all significantly negative is another fact supporting our argument. In summary, From Table 3, there is significant evidence that the second generation NHI Act has impact on the stock market. Thus Hypothesis One is valid.

Table 3. Test results of Taiwan listed companies' abnormal returns on Event Day

Event Period		AR	T(AR)	Z(AR)	CAR	T(CAR)	Z(CAR)
	-3	0.0158	0.2132	0.7290	0.0158	0.2132	0.7290
1	-2	0.3089***	4.3067***	4.2071***	0.3247***	3.3140****	3.6119***
	-1	-0.0780	-0.9837	0.1214	0.2467*	1.9305*	2.7397***
	0	0.5722	7.5881***	7.8646***	0.8189***	5.3465***	6.0253***
	1	-1.2839***	-13.646***	-12.8698***	-0.4650**	-2.5469**	-1.4106
	2	0.2230***	2.9371***	2.8683***	-0.2419	-1.2228	-0.2559
	3	0.3556***	5.228***	4.8118***	0.1137	0.5524	1.2765
	-3	-0.3587***	-5.7549***	-5.3839***	-0.3587***	-5.7549***	-5.3839***
2	-2	-0.1799**	-2.8500***	-4.2419***	-0.5386***	-6.0129***	-6.6641***
	-1	-0.2116***	-3.1661***	-1.8603*	-0.7502***	-6.9773***	-6.7550***
	0	0.3912***	6.4194***	7.2905***	-0.3590**	-2.8800***	-2.3828**
	1	0.2709***	3.9111***	3.7565***	-0.0881	-0.6086	-0.2858
	2	0.1689**	2.2740**	2.4547**	0.0808	0.4604	0.8328
	3	0.1503**	2.0098**	1.4766	0.2311	1.1253	1.2717
	-3	-0.1695**	-3.0403***	-4.5477***	-0.1695**	-3.0403***	-4.5477***
3	-2	-0.1031	-1.5861	-1.3121	-0.2725***	-3.2594***	-4.0312***
	-1	0.1493**	1.6748*	3.1028***	-0.1232	-1.0181	-0.6321
	0	0.7256***	9.0706***	8.3120***	0.6024***	4.4815***	4.7196***
	1	0.5286***	7.3157***	6.5947***	1.1310***	7.5992***	7.5577***
	2	0.1984***	3.1316***	3.9041***	1.3293***	8.0293***	8.3430***
	3	-0.0543	-0.7536	-2.0699**	1.2750***	7.6118***	7.4667***
	-3	0.7835***	11.1619***	10.1589***	0.7835***	11.1619***	10.1589***
4	-2	0.0175	0.2816	-0.0612	0.8010***	7.8243***	7.2006***
	-1	0.3629***	6.1137***	5.8174***	1.1639***	9.6489***	9.1242***
	0	0.6962***	12.3855***	13.5810***	1.8601***	13.6633***	14.0374***
	1	0.2095***	3.7758***	4.0024***	2.0696***	14.2223***	14.6908***
	2	0.0801	1.0292	1.3691	2.1497***	12.7333***	14.0445***
	3	-0.4452***	-7.8254***	-8.1613***	1.7045***	10.3705***	11.3825***
	-3	-0.5102***	-8.1571***	-7.8103***	-0.5102***	-8.1571***	-7.8103***
5	-2	-1.8566***	-23.5726***	-23.893***	-2.3668	-20.5622***	-21.8632***
	-1	-1.6983***	-17.5306***	-17.2923***	-4.0651***	-23.6279***	-25.4038***
	0	0.3426***	4.7537***	6.5522***	-3.7225***	-21.2370***	-22.2270***
	1	0.0160	0.2467	0.2955	-3.7065***	-20.4417***	-20.8989***
	2	0.4374***	6.0364***	5.5353***	-3.2691***	-18.0429***	-17.7482***
	3	-0.1874***	-2.6656***	-1.4510	-3.4565***	-18.0526***	-17.4180***

Note: a.AR is the average abnormal return, T (AR) is the cross-sectional statistics of AR, Z(AR) is the standardized cross-sectional statistics of AR, CAR is the cumulative average

abnormal return, T(CAR) is the cross-sectional statistics of CAR, and Z(CAR) for the standardized cross-sectional statistics of CAR.

b. *, **, and *** denote coefficient estimates significance at 10%, 5%, and 1% level, respectively.

3.5 The second generation NHI Act exerts different impact on different industries

Hypothesis 2 explores whether the second generation NHI has different impact on different industries. In the traditional event study method, the cross-sectional return of each company is assumed to be independent. The SUR model can deal with cross-sectional dependency resulting from event clustering, and analyze the effect of a particular event on different industries. Next, this study further employs the SUR to investigate whether different industries have different reactions to the second generation NHI Act. Six industries are considered for Hypothesis 2, including Plastics, Building Material and Construction, Finance and Insurance, Chemical and Biotechnology, Electronics and Other industry. The empirical results are shown in Table 4.

First, Event date 1 is the passage date of the first reading of the second generation NHI Act. The empirical result of Table 4 shows that there is no significant evidence to support that six industries have different impacts for Event Period 1. Secondly, Event Period 2 is the passage date of the second reading of the second generation NHI Act. Since the Building Material and Construction Industry show significantly negative results, passing the second reading of the second generation NHI Act has different effects on different industries. Thirdly, Event Period 3 is the passage date of the third reading of the second generation NHI Act, and there is no significant evidence here. Next, Event Period 4 is the announcement date of the Supplementary Premiums draft. In Table 4, the results are not significant at all. Finally, Event Period 5 is the decree date of the Supplementary Premiums Act; here, none of the results are significant.

This section investigates whether or not the five events of the second generation NHI Act have different impacts on different industries. There is one event showing significant evidence: the second reading of the second generation NHI Act. Event 1, 2, and 3 are the passage dates of the first, second and third readings of the second generation NHI Act, respectively. The evidences show that when the second reading of the amendment passed, Building Material and Construction Industry show significant negative results. The results reveal that this one industry felt strongly negative attitude toward the second generation NHI Act. The reason is perhaps because more professionals invest inthe Building Material and Construction Industry. As professional investors gathered more information about the second generation NHI Act, after decree they found that they must pay more premiums after the regulation became effective. Hence, significant results appear during Event Period 2 and not Event Period 1.

For Event Period 3, there is no significant evidence. One possible reason is that most investors understood by now the detail of the second generation NHI Act. Therefore, there would be no significant different impact on different industries.

Moreover, Event Period 4 and 5 are the announcement date and decree date of the draft of Supplementary Premiums. Event Period 4 and 5 show no evidence of any significant different influence on different industries. In conclusion, the results support Hypothesis 2: the second generation NHI exerts different impact on different industries.

Table 4. Test results of different companies' abnormal returns

$$R_{pt} = \alpha_p + \beta_p R_{mt} + \sum_{\tau=t_3}^{t_4} \gamma_{pt} D_\tau + \varepsilon_{pt}$$

Event Period	Industry					
	Plastic	Building Material and Construction	Finance and Insurance	Chemical and Biotechnology	Electronics	Other
1	-0.193	-0.651	1.072	-0.725	-1.285	0.332
	(0.847)	(0.515)	(0.284)	(0.468)	(0.199)	(0.740)
2	-0.321	-2.127	0.598	-1.835	0.860	-1.168
	(0.748)	(0.03)**	(0.550)	(0.07)*	(0.390)	(0.243)
3	-0.936	0.635	0.809	1.068	-0.061	-0.339
	(0.349)	(0.545)	(0.419)	(0.286)	(0.951)	(0.735)
4	-1.303	0.506	0.341	0.512	-0.305	0.663
	(0.193)	(0.613)	(0.733)	(0.608)	(0.761)	(0.507)
5	-0.931	-1.946	0.816	-0.066	0.018	-1.857
	(0.352)	(0.052)*	(0.414)	(0.947)	(0.986)	(0.063)*

Note: a. The estimates and p-value (shown in the parenthesis) are showing above. The p = 1, 2, 3, 4, 5, and 6 represent the Plastic Industry, Building Material and Construction Industry, Finance and Insurance Industry, Chemical and Biotechnology Industry, Electronics Industry, and Other industry, respectively.

b. *, **, and *** denote coefficient estimates significant at 10%, 5%, and 1% level, respectively.

5. Discussion

The purpose of this study is to explore the impact of the second generation NHI on the stock prices of listed companies in Taiwan. The Event Study methodology and Seemingly Unrelated Regression model were employed to analyze the impact on companies' stock prices during the period of NHI revision, and to discover whether or not the new national health insurance system exerts different influences on different industries. The main results are as follows.

First of all, the second generation NHI does affect companies' stock prices during the period of NHI regulation revision. Investigation of five events related to the second generation NHI Act found that all events indeed affect the stock market. People respond negatively to the second generation NHI Act in the beginning, due to additional premium charges. Afterwards,

people's attitudes became positive because they realized that the new premium system would benefit all citizens in the long run. However, for Event Period 5 which is the Supplementary Premiums Act decree date, significantly negative response was observed again. Investors realized that supplementary premiums charges levied on dividends would decrease their income. The results show evidence of significant negativity. However, rational thinking draws people to consider the benefit of the new social welfare system. Thus after the Supplementary Premiums Act is decreed, people understand that the regulation cannot be postponed or changed. After all, everyone benefits from the second generation NHI. Finally, people adjust their attitudes rationally and become positive about the NHI revision.

Secondly, the second generation NHI exerts different influences on different industries. One possible reason is that the second generation NHI charges supplementary premium on dividend income, which makes investors feel pessimistic about the revised insurance policy. As a result, investors altered their investment decisions, with a negative impact on the Building Material and Construction Industry. During the second generation NHI deliberation phase, it was still possible that the government may give up on the idea due to public opposition, or that the implementation date could be postponed. Thus investors of the six selected industries had reasons to believe that the information was not all negative for the prices of their stocks. However, after the announcement of the second reading of the second generation NHI Act and the announcement of the Supplementary Premiums final draft proposal, Building Material and Construction Industry showed significant negative effect.

For the Event Periods analyzed by this research, according to the "Taiwan Capitalization Weighted Stock Index" (TAIEX) released by the Taiwan Stock Exchange Corp. (see Table 5), the stock market fluctuated up and down during the period starting from the first reading passage of the second generation NHI, until the Ministry of the Health and Welfare's National Health Insurance Administration announced the finalized "Regulations Governing the Deduction and Payment of the Supplementary Insurance Premium of the National Health Insurance". Overall, the circulation TAIEX declined by 96.47 points from 10404.75 to 10308.28 points. For six industries with high transaction volume, including Plastics, Building Material and Construction, Finance and Insurance, Chemical and Biotechnology, Electronics and Other Industry, the stock market index went down for all but two industries, namely Plastics and Other Industry. The stock market index decline is an indication that people were concerned about additional premium charges after the second generation NHI took effect – this is the same as the empirical results of this study.

Table 5. the "Taiwan Capitalization Weighted Stock Index" (TAIEX) for each Event Period

Event Period	Closing Index							Up (Down)	Up (Down) %
	circulation TAIEX	Plastics	Building Material and Construction	Finance and Insurance	Bio-technology	Electronics	Other		
1	10404.75	224.26	314.97	944.56	118.92	383.25	159.26	(77.44)	(0.74)
2	11572.12	281.72	382.45	1074.25	140.12	405.24	176.58	3.03	0.03
3	11961.39	290.75	399.73	1178.66	140.69	410.89	178.93	(37.37)	(0.31)
4	10429.23	258.90	305.86	908.27	119.67	359.87	192.76	(224.74)	(2.22)
5	10308.28	242.11	310.32	911.14	114.88	352.43	212.39	130.56	1.28

Source: Taiwan Stock Exchange Corp.

Furthermore, there are some managerial implications from the results of this study. The calculation of the NHI premiums was based on regular salary income. Regulation states that the amount of insurance coverage shall not be less than their labor premium and monthly labor pension. However, some of people who are insured have only income that is not regular salary income. Thus the second generation NHI includes supplementary premium that is based on dividends, interest, and rental income, etc. As result, people without regular salary income, but have high income from interest, dividends, and rental revenue, will need to pay supplementary premiums under the new regulation. This new insurance system, charging NHI premiums according to the insureds' real financial condition, is much more equitable. Since governmental policies have the power to affect the lives of ordinary citizens, the government must actively communicate with the public before actual implementation, fully explaining the pros and cons of new policies while paying attention to the public's response. Such communication would help to avoid the situation where not all investors receive adequate information, and react pessimistically due to policy misunderstandings.

In summary, regardless of whether people are rich or poor, when they get sick, the NHI system provides appropriate medical care for all. According to the estimates from the Department of Health, only 17% of the public are required to pay supplementary premiums after the implementation of the second generation NHI. Hence, the impact is rather limited, and investors do not have to be too pessimistic. People should think rationally about the benefits and advantages provided by the second generation NHI, and let the stock market function accordingly.

The second generation NHI has been in effect for nearly two years. According to a survey released on August, 2014 by the Ministry of Health and Welfare's National Health Insurance Administration, the overall satisfaction level of the second generation NHI is 79.80%. The main reasons the satisfaction level was lower than before were that many people still did not fully understand the regulation, people worrying about being overcharged for premiums, and possible waste of medical resources. However, the spirit of the National Health Insurance is emphasis on social responsibilities, relying on collective community power to distribute risks shouldered by each individual. The system is designed with a mechanism to allow those with more economic resources to pay higher premiums, and those without to pay less, to achieve

one type of income redistribution effect. Taiwan is currently facing a multitude of healthcare problems, including an aging population, continuous advancement of the latest medical technology, and non-stop economic crises. When the available budget is always less than necessary, the National Healthcare Insurance's greatest challenge in the future, is proper management of the insurance practice towards the pursuit of an ideal welfare system for all.

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