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CHINESE ZODIAC EFFECT AND PRECIOUS METALS RETURNS OF 1900 – 2013

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Abstract: *Seasonality phenomenon based on superstitions and beliefs is still an interesting topic to investigate. Other belief which may become interesting topic to investigate is Chinese Zodiac. Chinese Zodiac Effect is based on a myth that each year circumstance will be affected by every underlying year symbol. This Chinese Zodiac will be accompanied by five fixed elements. Commodities market such as precious metal market is related closely with financial market since it becomes an alternative investments. Seasonalities could also occur in these market.*

Based on the background, this study will investigate Chinese Zodiac Effect and Fixed Element Effect on precious metals market. Data used by this study are gold and silver annual average since year of 1900 until 2013. Meanwhile, due to data availability, platinum annual data since year of 1960 until 2013 used. By applying GARCH (1,1), the finding shows that there are Chinese Zodiac Effect and Fixed Element Effect on precious metals market. The Chinese Zodiac and Fixed Element Effect tend to vary across those precious metals market. These may lead to the conclusion that Chinese Zodiac Effect and Fixed Element Effect just statistical properties only without any connection with superstitious and certain cultural beliefs.

Keywords: *Seasonalities, Chinese Zodiac, Fixed Element, Calendar Anomaly, Capital Market Efficiency.*

JEL Classifications: *G10, G14.*

1. INTRODUCTION

Calendar anomaly phenomenons or seasonalities have been interesting research topic in financial market during decades. These phenomenons may be occured because investors tend to seek alternative approaches instead of several approaches in modern financial theory such as capital asset pricing model. The gap between market dynamics and model based on modern theory of finance prediction occures when financial market behavior is not underlied by rational behavior which becomes baseline assumption in modern financial theory.

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Previously, many researches had scrunitized the seasonality phenomenons which was based on investor's behavior e.g. investor's habit and investor's psychology even seasonal data release such as Intraday Effect (Cheung 1995; Block 2000; Hmaied, Sioud, and Grar 2006), Weekend Effect/Monday Effect (Lakonishok and Maberly 1990; Dickinson and Peterson 1995; Brooks 1997; Brockman and Michayluk 1998; Coutts and Sheikh 2002), Quarterly Effect (Lee 2012; Das, Pattanayak, and Pathak 2008), Daylight Saving Effect (Worthington 2003; Kamstra, Kramer, and Levi 2002) and Holidays Effect (Kim and Park 1994; Liano and White 1994; McGuiness 2005; Marrett and Worthington 2009; Tsiakas 2010; Dumitriu, Stefanescu, and Nistol 2012; Kaplanski and Levy 2012; Casado, Muga, and Santamaria 2013) without any sociological and superstitious things related.

Recently, seasonality phenomenon has been involved broadly to something superstitious and culture related such as Friday the 13th Effect (Coutts 1999; Lucey 2000, 2001), even to rare studied phenomenons such as astrophysics effect (Karamchandani, Jain, and Mohadikar 2014) and Lunar Calendar Effect (Yuan, Zheng, and Zhu 2006; Liu 2010; McGuiness and Harris 2011). Liu (2010) stated that if financial market behavior was assumed as a socio-psychological expression. Therefore, culture and superstition would influence its process. For example, number 13 is often viewed as bad luck in western culture and so Friday the Thirthteenth. Both may influence the investors behavior.

There were some empirical evidences related with the statement. For examples, Coutts (1999); Lucey (2000, 2001) found that Friday the Thirthteenth might influence financial market returns. But, these phenomenons may not happen in some countries with domination of oriental culture such as China, Taiwan, Hongkong even some South East Asian countries in which number four represents bad luck and number eight represents good luck (Brown and Mitchell 2004).

Yuan, Zheng, and Zhu (2006) argumented that moon phase could affect human mood and human behavior. If these phenomenon occures, moon phase which is represented by Lunar Calender is able to influence investors behavior in investment decision making. Liu (2010) supported this argument by noting that Lunar Calendar still became major reference for many Chinese society activities (such as marriage and funeral ceremony) even business related activities. The study related with seasonality was also found in countries with low domination of oriental culture such as India, e.g. Karamchandani, Jain, and Mohadikar (2014) studied the effect of astrology which was represented by moon phase to Indian financial market returns.

Other interesting beliefs which may be related with financial market activities studied furthermore is Chinese Zodiac. Generally, it is believed that each year is affected by zodiac's nature which symbolizes that year. Chinese Zodiac are comprised from twelve animals which symbolize every year. These animals are rat, ox, tiger, dragon, snake, horse, goat, monkey, rooster, dog and pig. Actually, Chinese Zodiac cycle are astrological cycle which have been well known all over

the world. They are also equipped with five fixed elements which show the nature of each year based on wood, fire, earth, metal and water.

Since Chinese Zodiac are globally accepted and understood by most people in the world and various previous researches related with seasonality topics were conducted in stock market, also only a few researches found in commodity markets i.e. precious metals market eventhough commodity markets were highly connected with financial markets and those kind of seasonalities might occur in commodity markets too, as documented by Baur (2013). Baur (2013) found that gold return also tended to have specific pattern. Hence, this research tried to scrunitize whether there was Chinese Zodiac Effect and Fixed Element Effect on precious metals such as gold, silver and platinum.

2. LITERATURE REVIEW

2.1. Seasonality and Its Implication On Capital Market Efficiency

One of dominant paradigms in modern financial theory is capital market efficiency. Fama (1970) stated that efficient financial market was a market where the price of stocks fully reflect any available information instantly. There are three form of capital market efficiency. The first is weak capital market efficiency. Capital market efficiency is considered as the weak if its stock prices create the random walk. Semi strong capital market efficiency is made real when its stock prices fully reflect any public available information. The last, a capital market is assumed efficient in strong form when its stock prices fully reflect any available information.

Capital market efficiency becomes fundamental foundation for many financial theories based on rational investor assumption. Lucey (2000) stated that information efficiency had been manifested in Capital Asset Pricing Model, Arbitrage Pricing Theory, exchange rate interest rate parity, put-call parity in derivatives, et cetera. A form of capital market efficiency (such as weak form efficieny) does not allow investors to use historical price to predict the future price. But, many empirical researches on seasonality found that there were many patterns on stock returns. These patterns could be found on previous section. These evidences showed that capital market were not efficient in weak form and this conclusion caused asset valuation model validity questionable (Coutts and Sheikh 2002; Schwert 2002). Lakonishok and Maberly (1990) also stated that documented patterns in stock prices which was found in many empirical researches could not be predicted by current theories and confusing.

2.2. Superstition and Investor Behavior

Supertitious issues in financial markets appeared when Kolb and Rodriguez (1987) introduced this concept through their study about Friday the 13th Effect. In their

study, Kolb and Rodriguez (1987) tried to analyze whether superstitious things might affect investor's decision making process. After it was introduced, many researches were conducted to elaborate this phenomenon more such as Chamberlain, Cheung, and Kwan (1991); Coutts (1999); Lucey (2000, 2001); Botha (2013). Generally, these researches concluded that return on Friday the 13th was lower than any Friday. Another issue related with superstition in financial markets was Halloween Effect. Halloween Effect began to be studied in early 2000 by Maberly and Pierce (2003, 2004); Lucey and Zhao (2008); Haggard and Witte (2010); Lean (2011); Jacobsen and Zhang (2012).

Studies on seasonality extended to the effect of astrology toward stock market returns were documented by Karamchandani, Jain, and Mohadikar (2014) and Lunar Calendar based on Oriental culture were conducted by (Yuan, Zheng, and Zhu 2006; Liu 2010; McGuiness and Harris 2011). Karamchandani, Jain, and Mohadikar (2014) conducted the research on the effect of moon phase on stock returns based on the fact that human behavior tended to be abnormal with an agressiveness and instability as domination during full moon phase. His research was also conducted based on many superstition related folklore (such as the emerging werewolf during full moon).

Yuan, Zheng, and Zhu (2006) also supported the thought above by conducting research about the effect of moon phase on stock returns. They argumented that empirical evidence on biology and psychology showed the effect of moon phase on human mood and behavior. One of general evidence was documented by Law (1986) which found that women menstrual cycle was same length as moon cycle. Meanwhile, Liu (2010) argumented that Lunar Calendar caused sole patterns based on culture.

Superstitious issues related with seasonality must be studied carefully by considering country's or local cultural background in which capital market located. For example, the study on Friday the 13th Effect will be more approriated to be held in capital market located in some countries which are dominated by Judeo-Christianity belief e.g. Western countries and so Halloween Effect. Meanwhile, the research on Lunar Calendar Effect will be more appropriate to be held in capital market located in some countries which are dominated by Chinese's culture due to its complexity and it is only understood by Chinese investors or investors with deep understanding of Chinese culture. Previous study conducted by Meisami (2013) documented that Chinese Zodiac Effect occured in Hongkong Stock Exchange with higher Hangseng's mean returns in rat years and both mean and median returns are and statistically significant and lower in snake years, the Chinese Zodiac Effect also occured for S&P 500 with lower and statistically significant mean returns in snake and rooster years.

2.3. Chinese Zodiac

Chinese Zodiac and Fixed Element are more simply and universally accepted than the complex and exclusive Lunar Calendar. Despite it comes from Chinese culture, Chinese Zodiac and Fixed Element have been globally known and understood by most people around the world. Meisami (2013) also supported this statement by arguing that Chinese Zodiac astrology has significantly influenced the way people think, feel, or make daily decisions throughout history.

Chinese Zodiac are symbolized by 12 animals such as rat, ox, tiger, rabbit, dragon, snake, horse, goat, monkey, rooster, dog, and pig. Each year is symbolized by an animal which illustrates the nature and behavior of the year, too. Generally, Chinese Zodiac also have Five Fixed Elements. They are wood, fire, earth, metal and water element.

Table 1
What does Each Zodiac Animal Symbolize?

Rat	Sociable, shrewd, charismatic, intense, tenacious
Ox	Dependable, calm, ambitious, bord leader, hardworking, logical
Tiger	Rebellious, unpredictable, sincere, generous, daring, impulsive
Rabbit	Kind, gracious, good friend, shy, elegant, reserved
Dragon	Strong, proud, eccentric, intellectual, passionate
Snake	Deep thinker, creative, prudent, purposeful, wise
Horse	Popular, earthy, magnetic, cheerful, agile, magnetic
Sheep	Righteous, gentle, compassionate, mothering, peaceful
Monkey	Inventor, problem solver, polite, sociable, competitive
Rooster	Scientific, organized, decisive, conservative, alert, zealous, practical
Dog	Intelligent, honest, loyal, attractive, straight forward, moralistic
Boar	Patient, trusting, thoughful, understanding, sturdy

Source: Meisami (2013)

3. DATA

Data used by this study were gold, silver and platinum annual average data. Gold and silver data used were from 1900 until 2013 annual average data. Due to its availability, platinum data used were from1960 until 2013 annual average data. These data obtained from *www.kitco.com.*

Precious metals return were calculated by using formula :

$R_{\text{Precious Metals (t)}}$ = (Average price at year t – Average price at year t-1)/ Average price at year t-1

4. MODELS

Chinese Zodiac model was based on GARCH (1,1) as follows:

$R_{Precious\ Metals} = \beta_1 RAT + \beta_2 OX + \beta_3 TIGER + \beta_4 RABBIT + \beta_5 DRAGON + \beta_6 SNAKE + \beta_7 HORSE + \beta_8 GOAT + \beta_9 MONKEY + \beta_{10} ROOSTER + \beta_{11} DOG + \beta_{12} PIG + \varepsilon_t$

With

$\varepsilon_t = \Phi_t \varepsilon_{t-1} + \ldots + \Phi_t \varepsilon_{t-p} + \eta_t$

$\eta_t = \sigma_t \varepsilon_t$

$\sigma^2_t = \alpha_0 + \alpha_1 \eta^2_{t-1} + .. + \alpha_p \eta^2_{t-p} + \beta_1 \sigma^2_{t-1} + \ldots + \beta_q \sigma^2_{t-q}$

and ε_t is independent and identical distributed N(0,1) and independent from past condition of η_{t-p}.

$R_{Precious\ Metals}$	=	Precious Metals Return (gold, silver and platinum)
RAT	=	Dummy variable trading year, 1 if year of the Rat and 0 if not.
OX	=	Dummy variable trading year, 1 if year of the Ox and 0 if not.
TIGER	=	Dummy variable trading year, 1 if year of the Tiger and 0 if not.
RABBIT	=	Dummy variable trading year, 1 if year of the Rabbit and 0 if not.
DRAGON	=	Dummy variable trading year, 1 if year of the Dragon and 0 if not.
SNAKE	=	Dummy variable trading year, 1 if year of the Snake and 0 if not.
HORSE	=	Dummy variable trading year, 1 if year of the Horse and 0 if not.
GOAT	=	Dummy variable trading year, 1 if year of the Goat and 0 if not.
MONKEY	=	Dummy variable trading year, 1 if year of the Monkey and 0 if not.
ROOSTER	=	Dummy variable trading year, 1 if year of the Rooster and 0 if not.
DOG	=	Dummy variable trading year, 1 if year of the Dog and 0 if not.
PIG	=	Dummy variable trading year, 1 if year of the Pig and 0 if not.

Whereas, model for Fixed Element was based on GARCH (1,1) as follows:

$R_{Precious\ Metals} = \beta_1 WOOD + \beta_2 FIRE + \beta_3 EARTH + \beta_4 METAL + \beta_5 WATER + \varepsilon_t$

With

$\varepsilon_t = \Phi_t \varepsilon_{t-1} + \ldots + \Phi_t \varepsilon_{t-p} + \eta_t$

$\eta_t = \sigma_t \varepsilon_t$

$\sigma^2_t = \alpha_0 + \alpha_1 \eta^2_{t-1} + .. + \alpha_p \eta^2_{t-p} + \beta_1 \sigma^2_{t-1} + \ldots + \beta_q \sigma^2_{t-q}$

and ε_t is independent and identical distributed N(0,1) and independent from past condition of η_{t-p}.

$R_{Precious\ Metals}$ = Precious Metals Return (gold, silver and platinum)
WOOD = Dummy variable trading year, 1 if year of Wood and 0 if not.
FIRE = Dummy variable trading year, 1 if year of Fire and 0 if not.
EARTH = Dummy variable trading year, 1 if year of Earth and 0 if not.
METAL = Dummy variable trading year, 1 if year of Metal and 0 if not.
WATER = Dummy variable trading year, 1 if year of Water and 0 if not.

Augmented Dickey-Fuller Test / ADF was held to test data stationarity before GARCH analysis.

5. EMPIRICAL RESULTS

5.1. Descriptive Statistics

Descriptive statistics of gold return based on Chinese Zodiac is illustrated in Table 2. Year of the monkey had the biggest average annual return if it was compared with other years. But, the year of the dragon had the biggest negative average annnual return when it was compared with another years.

Meanwhile, descriptive statistics of gold return based on Fixed Element is illustrated in Table 2. Year of metal had the biggest average annual return when it was compared with the other years. However, the year of fire had the lowest annual average return when it was compared with other years. There was no negative return found in gold return based on Fixed Elements.

Table 2
Gold Return's Descriptive Statistics By Chinese Zodiac

	N	*Minimum*	*Maximum*	*Mean*		*Std. Deviation*
	Statistic	*Statistic*	*Statistic*	*Statistic*	*Std. Error*	*Statistic*
Rat	9	-0.151	0.425	0.057	0.058	0.173
Ox	10	-0.146	0.673	0.043	0.074	0.234
Tiger	10	-0.111	0.636	0.104	0.068	0.214
Rabbit	10	-0.052	0.283	0.044	0.035	0.111
Dragon	10	-0.225	0.062	-0.020	0.024	0.075
Snake	10	-0.154	0.183	-0.012	0.028	0.090
Horse	9	-0.001	0.308	0.051	0.036	0.107
Goat	9	-0.174	0.587	0.058	0.072	0.217
Monkey	9	-0.051	0.997	0.155	0.109	0.327
Rooster	9	-0.249	0.273	0.026	0.045	0.134
Dog	9	-0.183	0.357	0.049	0.060	0.181
Pig	9	0.000	0.152	0.050	0.022	0.067

Table 3
Gold Return's Descriptive Statistics By Fixed Elements

	N	*Minimum*	*Maximum*	*Mean*		*Std. Deviation*
	Statistic	*Statistic*	*Statistic*	*Statistic*	*Std. Error*	*Statistic*
Metal	23	-0.249	0.997	0.049	0.049	0.236
Water	23	-0.183	0.425	0.048	0.027	0.132
Wood	22	-0.151	0.636	0.045	0.034	0.159
Fire	22	-0.225	0.357	0.032	0.026	0.121
Earth	22	-0.127	0.587	0.047	0.034	0.158

Descriptive statistics of silver return based on Chinese Zodiac is illustrated in Table 4. Year of the goat have the biggest average annual return compared with the other years. But, the year of the monkey had the biggest negative return when it was compared with another years. Meanwhile descriptive statistics of silver return based on Fixed Elements is illustrated in Table 5. The year of earth had the biggest average annual return if it was compared with another years but the year of metal had the biggest negative annual average return if it was compared with another years.

Table 4
Silver Return's Descriptive Statistics By Chinese Zodiac

	N	*Minimum*	*Maximum*	*Mean*		*Std. Deviation*
	Statistic	*Statistic*	*Statistic*	*Statistic*	*Std. Error*	*Statistic*
Rat	9	-0.269	0.418	-0.030	0.074	0.223
Ox	10	-0.139	0.588	0.121	0.085	0.270
Tiger	10	-0.223	0.803	0.079	0.099	0.312
Rabbit	10	-0.182	0.266	0.040	0.042	0.134
Dragon	10	-0.123	0.351	0.028	0.042	0.134
Snake	10	-0.349	0.186	-0.024	0.047	0.147
Horse	9	-0.324	0.276	0.019	0.068	0.205
Goat	9	-0.207	2.692	0.401	0.298	0.893
Monkey	9	-0.510	0.143	-0.108	0.062	0.187
Rooster	9	-0.486	0.720	0.160	0.122	0.367
Dog	9	-0.095	0.461	0.119	0.062	0.185
Pig	9	-0.147	0.144	-0.011	0.036	0.107

Table 5
Silver Return's Descriptive Statistics By Fixed Elements

	N	*Minimum*	*Maximum*	*Mean*		*Std. Deviation*
	Statistic	*Statistic*	*Statistic*	*Statistic*	*Std. Error*	*Statistic*
Metal	22	-0.510	0.803	-0.062	0.055	0.259
Water	23	-0.349	0.720	0.111	0.052	0.250
Wood	21	-0.266	0.580	0.075	0.041	0.187
Fire	22	-0.223	0.593	0.081	0.046	0.217
Earth	22	-0.269	2.692	0.130	0.128	0.601

Descriptive statistics of platinum return based on Chinese Zodiac is illustrated in Table 6. The year of the monkey had the biggest average annual return when it was compared with other years. But, the year of rooster had the biggest negative average annual return if it was compared with the other years. Whereas, descriptive statistics of gold return based on Fixed Elements is illustrated in Table 7.

The year of earth had the biggest average annual return when it was compared with other years. But, the year of wood had the lowest annual average return when it was compared with another years. There was no negative return found in platinum return based on Fixed Elements.

Table 6
Platinum Return's Descriptive Statistics By Chinese Zodiac

	N	*Minimum*	*Maximum*	*Mean*		*Std. Deviation*
	Statistic	*Statistic*	*Statistic*	*Statistic*	*Std. Error*	*Statistic*
Rat	4	-0.158	0.208	0.031	0.085	0.170
Ox	5	-0.235	0.241	-0.038	0.084	0.187
Tiger	5	-0.042	0.584	0.225	0.115	0.257
Rabbit	5	-0.219	0.197	0.007	0.068	0.152
Dragon	5	-0.099	0.440	0.081	0.095	0.213
Snake	5	-0.042	0.108	0.007	0.028	0.063
Horse	4	-0.079	0.654	0.152	0.169	0.337
Goat	4	-0.205	0.709	0.223	0.191	0.381
Monkey	4	-0.041	1.325	0.507	0.296	0.592
Rooster	4	-0.342	0.061	-0.114	0.098	0.196
Dog	4	-0.266	0.274	-0.039	0.132	0.264
Pig	4	-0.278	0.294	0.051	0.121	0.242

Table 7
Platinum Return's Descriptive Statistics By Fixed Elements

	N	*Minimum*	*Maximum*	*Mean*		*Std. Deviation*
	Statistic	*Statistic*	*Statistic*	*Statistic*	*Std. Error*	*Statistic*
Metal	11	-0.342	0.520	0.017	0.090	0.297
Water	12	-0.266	0.294	0.044	0.048	0.167
Wood	10	-0.219	0.247	0.031	0.052	0.164
Fire	10	-0.062	0.584	0.129	0.060	0.190
Earth	10	-0.235	1.325	0.234	0.159	0.504

5.2. Data Stationarity Test Results

Based on augmented Dickey-Fuller test statistic for gold, silver and platinum with under 5% probability, data used by this study were stationary. The complete result of this test is shown in Table 8. below.

Table 8
Augmented Dickey-Fuller Test Statistic

Augmented Dickey-Fuller test statistic	*t-statistic*	*Prob.*
Gold	–6.741	0.000
Silver	–9.893	0.000
Platinum	–6.560	0.000

5.3. GARCH (1,1) Results

Year of the Rat, Dragon, Snake and Goat had negative impact toward gold return on 1% level of significance. The biggest negative effect came from the year of Snake, Goat, Dragon and Rat consecutively. The year of Horse had a positive and significant impact toward gold return on 1% level of significance. Meanwhile, another Zodiac did not have any impact toward gold return. The year of fire and metal negatively influenced gold return on 1% level of significance. The negative impact of year of fire was bigger than year of metal. Other elements did not have any significant impact toward gold return.

The year of the Monkey negatively influenced silver return on 1% level of significance. Meanwhile, other Zodiac did not influence silver return. Later, the year of earth had positive impact toward silver return on 1% level of significance. But, the year of metal positively influenced silver return on 10% level of significance. Other elements did not influence silver return.

Tabel 9
Chinese Zodiac Effect On Gold

Variable	*Coefficient*	*Std. Error*	**z-***Statistic*	*Prob.*
RAT	-0.018	0.004	-4.242	0.000
OX	-0.003	0.014	-0.225	0.822
TIGER	0.001	0.025	0.042	0.967
RABBIT	-0.011	0.007	-1.520	0.129
DRAGON	-0.026	0.004	-6.987	0.000
SNAKE	-0.048	0.004	-11.779	0.000
HORSE	0.041	0.012	3.489	0.001
GOAT	-0.031	0.010	-3.154	0.002
MONKEY	0.001	0.022	0.045	0.964
ROOSTER	0.001	0.008	0.088	0.930
DOG	-0.002	0.006	-0.414	0.679

Table 10
Five Fixed Elements Effect on Gold

Variable	*Coefficient*	*Std. Error*	*z-Statistic*	*Prob.*
Wood	0.001	0.013	0.041	0.967
Fire	–0.015	0.004	–3.939	0.000
Earth	–0.004	0.005	–0.882	0.378
Metal	–0.013	0.002	–5.821	0.000
Water	0.004	0.014	0.275	0.783

Only the year of Rooster gave negative impact toward platinum return on 5% level of significance. Whereas, the year of Monkey, Tiger and Goat positively influenced platinum return. Then, the year of Monkey had the biggest positive impact on 1% level of significance. The year of Tiger and Goat positively and significantly influenced platinum return on 10% level of significance. Meanwhile, other Zodiacs did not have any impact toward platinum return. For the year of earth, it had positive impact toward platinum return on 1% level of significance. Other elements did not have any significant impact toward platinum return.

Table 11
Chinese Zodiac Effect On Silver

Variable	*Coefficient*	*Std. Error*	*z-Statistic*	*Prob.*
RAT	–0.030	0.058	–0.522	0.602
OX	–0.060	0.059	–1.019	0.308
TIGER	–0.080	0.077	–1.035	0.301
RABBIT	0.099	0.073	1.368	0.171
DRAGON	0.065	0.074	0.889	0.374
SNAKE	0.027	0.090	0.299	0.765
HORSE	0.028	0.064	0.437	0.662
GOAT	0.030	0.052	0.584	0.559
MONKEY	–0.123	0.000	–7942.116	0.000
ROOSTER	0.129	0.057	2.258	0.024
DOG	0.112	0.063	1.765	0.078
PIG	–0.007	0.107	–0.066	0.948

Table 12
Five Fixed Elements Effect on Silver

Variable	*Coefficient*	*Std. Error*	*z-Statistic*	*Prob.*
WOOD	0.058	0.048	1.209	0.227
FIRE	0.043	0.032	1.333	0.183
EARTH	0.004	0.000	73.193	0.000
METAL	–0.085	0.048	–1.778	0.076
WATER	0.056	0.042	1.327	0.185

Table 13
Chinese Zodiac Effect on Platinum

Variable	*Coefficient*	*Std. Error*	*z-Statistic*	*Prob.*
RAT	0.035	0.206	0.172	0.864
OX	–0.031	0.165	–0.190	0.850
TIGER	0.219	0.129	1.693	0.091
RABBIT	0.008	0.204	0.037	0.970
DRAGON	0.061	0.165	0.373	0.709
SNAKE	–0.008	0.543	–0.014	0.989
HORSE	0.170	0.123	1.384	0.166
GOAT	0.186	0.100	1.851	0.064
MONKEY	0.487	0.081	6.030	0.000
ROOSTER	–0.199	0.085	–2.337	0.019
DOG	–0.089	0.111	–0.804	0.422
PIG	0.033	0.146	0.224	0.823

Table 14
Five Fixed Elements Effect on Platinum

Variable	*Coefficient*	*Std. Error*	*z-Statistic*	*Prob.*
WOOD	0.035	0.159	0.219	0.827
FIRE	0.129	0.140	0.923	0.356
EARTH	0.240	0.075	3.182	0.002
METAL	0.019	0.088	0.216	0.829
WATER	0.040	0.143	0.278	0.781

6. CONCLUSION

There was Chinese Zodiac Effect and Fixed Element Effect on precious metals market. This study found there are various impact of Chinese Zodiac and Fixed Elements on precious metals returns.

This research finding might lead to the conclusion that Chinese Zodiac Effect and Fixed Element Effect were merely just statistical properties and might not occure because any superstitious and cultural belief issues. Eventhough Chinese Zodiacs and Fixed Elements were so well known to symbolize a year all over the world, unfortunately precious metals markets behavior did not reflect any characteristics which had been symbolized by those Chinese Zodiacs and Fixed Elements.

References

Baur, Dirk G. (2013), "The Autumn Effect of Gold." *Research in International Business and Finance* no. 27 (1): 1–11.

Block, Stanley B. (2000), "The Pattern of Intraday Portfolio Management Decisions: A Case Study of Intraday Security Return Patterns." *Journal of Business Research* no. 2000: 321-326.

Botha, Ferdi. (2013), "Stock Returns and Friday the 13th Effect in Five African Countries." *African Review of Economics and Finance* no. 4 (2): 247-253.

Brockman, Paul, and David Michayluk. (1998), "Individual Versus Institutional Investors and the Weekend Effect." *Journal of Economics and Finance* no. 22 (1): 71-85.

Brooks, Raymond M. (1997), "The Individual Investor and the Weekend Effect: A Reexamination with Intraday Data." *Quarterly Review of Economics and Finance* no. 37 (7): 725-737.

Brown, Phillip, and Jason Mitchell. (2004), "Culture and Stock Price Clustering: Evidence from the Peoples's Republic of China." *Working Paper*.

Casado, Jorge, Luis Muga, and Rafael Santamaria. (2013), "The Effect of US Holidays on European Markets: When the Cat's Away." *Accounting and Finance* no. 53:111-136.

Chamberlain, Trevor W., C. Sherman Cheung, and Clarence C. Y. Kwan. (1991), "The Friday the Thirteenth Effect: Myth or Reality?" *Quarterly Journal of Business & Economics* no. 30 (2): 111-117.

Cheung, Yan-Leung (1995), "Intraday Returns and The Day-End Effect: Evidence From The Hong Kong Equity Market." *Journal of Business Finance & Accounting* no. 22 (7):1023-1034.

Coutts, J. Andrew. (1999), "Friday the Thirteenth and the Financial Times Industrial Ordinary Shares Index 1935-94." *Applied Economics Letters* no. 6 (1): 35-37.

Coutts, J. Andrew, and Mohamed A Sheikh. (2002), "The Anomalies that Aren't There: the Weekend, January and Pre-Holiday Effects on the All Gold Index on the Johannesburg Stock Exchange 1987-1997." *Applied Financial Economics* no. 12: 863-871.

Das, Santu, J. K. Pattanayak, and Pramod Pathak. (2008), "The Effect of Quarterly Earnings Announcements on Sensex: A Case with Clustering of Events." *ICFAI Journal of Accounting Research* no. 7 (4): 64-78.

Dickinson, Amy, and David R. Peterson. (1995), "Expectations of Weekend and Turn-of-the-Month Mean Return Shifts Implicit in Index Call Option Prices." *Journal of Financial And Strategic Decisions* no. 8 (3): 69-76.

Dumitriu, Ramona, Razvan Stefanescu, and Costel Nistol. (2012), Holiday Effects During Quiet and Turbulent Times. Paper read at International Conference of Scientific Paper Afases at Brasov.

Fama, Eugene F. (1970), "Efficient Capital Markets: A Review of Theory and Empirical Work." *Journal of Finance* no. 25 (2): 383-417.

Haggard, K. Stephen, and H. Douglas Witte. (2010), "The Halloween Effect: Trick or Treat?" *International Review of Financial Analysis* no. 19 (5): 379-387.

Hmaied, Dorra Mezzez, Olfa Benouda Sioud, and Adel Grar. (2006), "Intradaily and Weekly Patterns of Bid-Ask Spreads, Trading Volume and Volatility on the Tunisian Stock Exchange." *Banque & Marchés* no. 84 (September-October): 35-44.

Jacobsen, Ben, and Cherry Y. Zhang. (2012), "The Halloween Indicator: Everywhere and All the Time." *SSRN Working Paper*.

Kamstra, Mark J., Lisa A. Kramer, and Maurice D. Levi. (2002), "Losing Sleep at the Market: The Daylight Saving Anomaly: Reply." *American Economic Review* 1257-1263.

Kaplanski, Guy, and Haim Levy. (2012), "The Holiday and Yom Kippur War Sentiment Effects: The Tel Aviv Stock Exchange (TASE)." *Quantitative Finance* no. 12 (8): 1283-1298.

Karamchandani, Muskan, Savera Jain, and Shubhra Mohadikar. (2014), "A Study on Effects of Astrophysical Phases in Indian Stock Market." *International Journal of Advance Research in Computer Science and Management Studies* no. 2 (2): 73-82.

Kim, Chan-Wung, and Jinwoo Park. (1994), "Holiday Effects and Stock Returns: Further Evidence." *Journal of Financial and Quantitative Analysis* no. 29 (1): 146-157.

Kolb, Robert W., and Ricardo J. Rodriguez. (1987), "Friday the Thirteenth: 'Part VII'—A Note." *Journal of Finance* no. 42 (5): 1385-1387.

Lakonishok, Josef, and Edwin Maberly. (1990), "The Weekend Effect: Trading Pattern of Individual and Institutional Investors." *Journal of Finance* no. 45 (1): 231-224.

Law, S. P. (1986), "The Regulation of Menstrual Cycle and Its Relationship to the Moon." *Obstetric Gynecology Scandinavia* no. 65 (45-48).

Lean, Hooi Hooi. (2011), "The Halloween Puzzle in Selected Asian Stock Markets." *International Journal of Economics and Management* no. 5 (1): 216-225.

Lee, Yen-Jung. (2012), "The Effect of Quarterly Report Readability on Information Efficiency of Stock Prices." *Contemporary Accounting Research* no. 29 (4): 1137-1170.

Liano, Kartono, and Larry R. White. (1994), "Business Cycles and the Pre-Holiday Effect in Stock Returns." *Applied Financial Economics* no. 4: 171-174.

Liu, Weihan. (2010), "Lunar Calendar Effect: Evidence of the Chinese Farmer's Calendar on the Equity Markets in East Asia." *Working Paper*.

Lucey, Brian M. (2000), "Friday the 13th and the Philosophical Basis of Financial Economics." *Journal of Economics & Finance* no. 24 (3): 294-301.

———. (2001), "Friday the 13th: International Evidence." *Applied Economics Letters* no. 8 (9):577-579.

Lucey, Brian M., and Shelly Zhao. (2008), "Halloween or January? Yet Another Puzzle." *International Review of Financial Analysis* no. 17: 1055-1069.

Maberly, Edwin D., and Raylene M. Pierce. (2003), "The Halloween Effect and Japanese Equity Prices: Myth or Exploitable Anomaly." *Asia-Pacific Financial Markets* no. 10 (4):319-334.

———. (2004), "Stock Market Efficiency Withstands Another Challenge: Solving the "Sell in May/Buy after Halloween" Puzzle." *Econ Journal Watch* no. 1 (1): 29-46.

Marrett, George J., and Andrew C. Worthington. (2009), "An Empirical Note on the Holiday Effect in the Australian Stock Market, 1996-2006." *Applied Economics Letters* no. 16:1769-1772.

McGuiness, Paul B. (2005), "A Re-examination of the Holiday Effect in Stock Returns: the Case of Hongkong." *Applied Financial Economics* no. 15: 1107-1123.

McGuiness, Paul B., and Richard D.F. Harris. (2011), "Comparison of the "Turn-of-the-Month" and Lunar New Year Return Effects in Three Chinese Markets: Hong Kong, Shanghai and Shenzhen." *Applied Financial Economics* no. 21: 917-929.

Meisami, Alex. (2013), "Zodiac Calendar and Market Returns." *Asian Journal of Finance & Accounting* no. 5 (1). doi: 10.5296/ajfa.v5i1.3637.

Schwert, G. William. (2002), "Calendar Anomalies and Market Efficiency." *NBER Working Paper* no. 9277.

Tsiakas, Ilias. (2010), "The Economic Gains of Trading Stocks Around Holidays." *Journal of Financial Research* no. 33 (1):1-26.

Worthington, Andrew C. (2003), "Losing Sleep at the Market: An Empirical Note on the Daylight Saving Anomaly in Australia." *Economic Papers* no. 22 (4):83-93.

Yuan, Kathy, Lu Zheng, and Qiaoqiao Zhu. (2006), "Are Investors Moonstruck? Lunar Phases and Stock Returns." *Journal of Empirical Finance* no. 13 (1): 1-23.