Clustering of Thai Investors by Investment Behavior in Bitcoin

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Abstract

This research aims to cluster Thai investors according to their investment behavior in Bitcoin and to study the specific behavior of investors in each group. There were 389 Bitcoin investor participants that were surveyed using the quota sampling method and online questionnaires. The study indicates that Thai Bitcoin investors can be divided into three groups with different characteristics. Group 1 invests to socialize and exchange news and have only one Bitcoin address. This group invest for speculation only. Also, having the least investment experience in Bitcoin, Group 1 was labelled as the "Amateur Investors." Group 2 investors speculate and are invested in Bitcoin for additional opportunities to increase revenue. They have more than three Bitcoin addresses and invest by both mining and trading for speculation. Furthermore, friends of this group have an influence on the decision to invest in Bitcoin and they acquired Bitcoin in small increments. Therefore, the second group was labelled as "Serious Speculators." Group 3 investors invest for diversification and also have four or more Bitcoin addresses. They invest by both mining and speculative trading. Moreover, this group has confidence in themselves and made

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Bitcoin investment decision by taking into consideration analysts and media. This group has the most investment experience in Bitcoin and possesses a large quantity of it. Therefore, the third group was labelled as "Investors for Diversification."

Keywords: Cluster Analysis, Investment Behavior, Bitcoin, Thai Investors

การจัดกลุ่มผู้ลงทุนไทยตามพฤติกรรมการลงทุนใน Bitcoin

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บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อจัดกลุ่มผู้ลงทุนชาวไทยตามพฤติกรรมการลงทุนใน Bitcoin รวมถึงศึกษาพฤติกรรมเฉพาะของผู้ลงทุนในแต่ละกลุ่ม รวบรวมข้อมูลจากการเก็บแบบสอบถามจากผู้ที่ลงทุนใน Bitcoin จำนวน 389 ราย และใช้วิธีการสุ่มตัวอย่างแบบโควต้า

ผลการศึกษา พบว่า สามารถจัดกลุ่มผู้ลงทุนออกเป็น 3 กลุ่ม คือ กลุ่มที่ 1 เป็นกลุ่มผู้ลงทุนที่ลงทุนเพื่อเข้าสังคมและเพื่อแลกเปลี่ยนข่าวสาร มีบัญชีลงทุนเพียงบัญชีเดียว ส่วนใหญ่ลงทุนโดยการซื้อขายเพื่อเก็งกำไรอย่างเดียวและมีประสบการณ์การลงทุนใน Bitcoin น้อยที่สุด จึงตั้งชื่อกลุ่มที่ 1 ว่า "นักลงทุนสมัครเล่น" กลุ่มที่ 2 เป็นกลุ่มผู้ลงทุนที่มุ่งเก็งกำไรและเป็นโอกาสเพิ่มรายได้ มีบัญชีลงทุนมากกว่า 3 บัญชี ลงทุนโดยทั้งขุดและซื้อขายเพื่อเก็งกำไร เพื่อมีอิทธิพลในการตัดสินใจลงทุน และครอบครอง Bitcoin ทีละน้อย จึงตั้งชื่อกลุ่มที่ 2 ว่า "ผู้ลงทุนที่มุ่งเก็งกำไร" และกลุ่มที่ 3 ผู้ลงทุนกลุ่มนี้ลงทุนเพื่อกระจายการลงทุน มีบัญชีลงทุนตั้งแต่ 4 บัญชีขึ้นไป ลงทุนโดยวิธีทั้งขุดและซื้อขายเพื่อเก็งกำไร ผู้ลงทุนมีความเชื่อมั่นในตนเองและพิจารณาจากนักวิเคราะห์/สื่อต่าง ๆ นอกจากนี้ยังมีประสบการณ์ลงทุนใน Bitcoin มากที่สุด รวมถึงมีการครอบครอง Bitcoin ทีละมาก ๆ จึงตั้งชื่อกลุ่มที่ 3 ว่า "นักกระจายความเสี่ยง"

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Introduction

Investment is one way to increase income in addition to holding a regular job or to save for retirement (Hirschey & Nofsinger, 2008). Additionally, to invest for financial goals, investment can also create excitement (Strong, 1998), causing people to be interested in investment. Moreover, investors are looking for new capital investments to diversify their portfolios and reduce the risk of investing in only one source. At present, a new source of investment has emerged with few conditions and is straightforward to access known as digital currencies, with Bitcoin being considered as the world's first digital currency (Farell, 2015) that the general public can readily invest in. Furthermore, Bitcoin has a low investment cost compared to other investments such as stocks that have more fees and real estate that has to pay more maintenance costs (Siamblockchain, 2019). Investment in Bitcoin also provides an option for investors to choose to receive returns from speculation or mining, as well as offers speed in transfers, transactions, and operations. Therefore, the number of investors in Bitcoin are likely to increase.

However, research shows that investors purchase Bitcoin with the objective of speculation rather than to buy products and services (Glaser et al., 2014). Regarding Thai research, Srikanjanasorn (2019) found that Thai investors who invest in Bitcoin have a speculative investment behavior and also seek opportunities to increase revenue. The most common investment method is trading only, including investment by self-confidence and consideration of various sources of information such as analysts, articles, and media. Sullivan and Miller (1996) organized the behavior of investors who invest in new investment sources or growing investment sources and found that different investor occupation results in different investment behavior in terms of investment experience in Bitcoin, the highest possession, and the current Bitcoin amount remaining of Bitcoin. They also found that investors can be divided into three groups: Economic Investor, Hedonistic Investor, and Altruistic Investor.

This current research aims to further the research of Srikanjanasorn (2019), who studied Bitcoin investment behavior of Thai investors. Therefore, this research

aims to study Thai investor grouping according to Bitcoin investment behavior and study the specific behavior of investors in each group. The research results may serve as a guideline for the government, related parties, and business operators regarding Bitcoin in terms of formulating strategies. It may also be of benefit to those who are interested in investing as well as be of interest to other researchers in this area.

Methodology

Data source

This research uses secondary data from the research of Srikanjanasorn (2019). This data was collected using an online survey, which was developed by the researcher and checked of validity and reliability, through the website of the Bitcoin Center Thailand. Moreover, the researcher used quota sampling with a sample size of 389 Bitcoin investors, consisting of 249 male investors and 140 female investors. The proportion of males was approximately two-thirds, which may reflect the fact that most investors are male.

Data Analysis

Cluster Analysis was used for organizing groups of investors with similar behaviors into the same group. This research employed two-step clustering analysis because the data consisted of qualitative variables which are the main objective of investing in Bitcoin, the number of Bitcoin addresses, investment method, and person influencing the decision to start investing in Bitcoin; and quantitative variables which are investment experience in Bitcoin, highest Bitcoin possessed, and current Bitcoin remaining. Moreover, this method can automatically determine the appropriate number of groups and can be used with a great deal of data (Caccam & Refran, 2012). The steps were:

Step 1 Pre-Clustering: Performing data analysis and dividing data into small groups by using the Euclidian distance criteria and the log-likelihood distance (Arminger et al., 1995).

Step 2 Clustering: Combining small groups into the desired number of each group, which are identical in each group and are different between groups.

Results

The results of clustering of 389 samples of Thai investors by investment behavior in Bitcoin was conducted using seven investment behavior variables and were considered by comparing the percentage of the group and the total percentage. If the percentage in the group was 5% or more, it was considered an outstanding feature. It was found that the group could be divided into three groups that are most clearly different (Table 1 and Table 2).

Table 1: Percentage of Bitcoin Investors Classified by Investment Behavior and Investor Groups

Investment Behavior	Group of investors			Total
	Amateur	Serious Speculators	Investors for Diversification	
Main objective of investing in Bitcoin				
For speculation/opportunity to	73.36	89.29*	41.27	72.75
increase revenue	7.48	0.00	33.33*	9.51
For diversify investment	13.08*	0.00	1.59	7.46
For socialize/exchange Bitcoin news	0.93	3.57	12.70*	3.60
For fun, entertainment	3.74	7.14	7.94	5.40
To buy or spend products that	1.40	0.00	3.17	1.29
require Bitcoin				
Others				
Bitcoin Address				
1 account	70.09*	46.43	34.92	57.58
2 accounts	11.21	7.14	14.29	10.54
3 accounts	3.74	14.29*	12.70	8.23
4 accounts	5.61	0.00	12.70*	5.14
5 accounts or more	9.35	32.14*	25.39*	18.51

Table 1: Percentage of Bitcoin Investors Classified by Investment Behavior and Investor Groups (cont.)

Investment Behavior	Group of investors			Total
	Amateur	Serious Speculators	Investors for Diversification	
Bitcoin investment method				
Mining	0.00	**26.79***	6.35	8.74
Trading	**97.66***	0.00	28.57	58.35
Both Mining and Trading	2.34	**73.21***	**65.08***	32.90
People influence the decision to start investing in Bitcoin				
Friend	17.76	**23.21***	0.00	16.45
Yourself	51.41	39.29	**55.56***	48.59
Analyst / Analysis / Media	30.37	32.14	**44.44***	33.16
Others	0.47	5.36	0.00	1.80
Total	55.01	28.79	16.20	100.00

Note: * Outstanding

Table 2: Mean and Standard Deviation Classified by Investment Behavior and Investor Groups

Investment Behavior	Group of Investors			total
	Amateur	Serious Speculators	Investors for Diversification	
Investment experience in Bitcoin (year)	1.34 ↓	1.38 ↓	2.03 ↑	1.46
	(0.85)	(0.67)	(1.50)	(0.97)
The highest Bitcoin possessed (BTC)	1.10 ↓	0.69 ↓	10.69 ↑	2.54
	(1.85)	(0.85)	(6.83)	(4.74)
Current bitcoin balance (BTC)	0.27 ↓	0.22 ↓	3.70 ↑	0.81
	(0.63)	(0.42)	(4.45)	(2.25)

Note: The values in parentheses are standard deviation

↑ More than total average

↓ Less than total average

When considering the differences in investment behavior in all seven variables, it was found that investors in each group had different behaviors and could be named as follows:

Investor Group 1 Amateur Investors

Investors in Group 1 account for 55.01% of participants. The main objective of investing in Bitcoin is to socialize and exchange news about Bitcoin. This group represents over half of participants and thus is larger than the other groups. They have only one investment account and invest to speculate only and do no investment by mining. Most decided to invest in Bitcoin on their own. When compare with the total average, it was found that the sample in this group had the lowest investment experience in Bitcoin, averaging 1.34 years. The number of Bitcoins that they possessed had the highest average of 1.10 BTC and they had a current Bitcoin balance of 0.27 BTC.

Investors Group 2 Serious Speculators

Investors in Group 2 account for 28.79% of participants who mainly invest in Bitcoin for speculation and opportunity to increase revenue. The number of investment accounts in Group 2 are more than Group 1, meaning Group 2 has more than 3 or 5 accounts. The investors in this group usually do not invest by trading for speculation only but mainly invest by mining or both mining and trading for speculation. Although most invested by self-confidence, the outstanding characteristic of this group is that their friends influence the decision to start investing. Interestingly, investors in this group have only slightly more experience in Bitcoin investment than Group 1, with average time investing in Bitcoin at 1.38 years. It was also found that behavior in terms of Bitcoin possession was to acquire it in small increments and the number of Bitcoins possessed had the highest average of 0.69 BTC and the current number of Bitcoin remaining was 0.22 BTC, which is the least when compared with the other groups.

Investors Group 3 Investors for Diversification

Investors in Group 3 account for 16.20% of participants who mainly invested in Bitcoin to diversify investment. They are also looking to invest for fun and entertainment at a higher proportion than the investors in Group 1 and Group 2. There have four investment accounts or more and invest in Bitcoin by both mining and trading for speculation. It can be noticed that this group of investors will consider investing on their own and from various media analysts and articles only. They have the most experience of investing in Bitcoin at 2.03 years, the highest Bitcoin possessed at 10.69 BTC, and remaining Bitcoin amount at 3.70 BTC.

In addition, the researcher also considered personal factors and other investment behavior classified by group of investors as shown in Table 3.

Table 3: Percentage of Investors in Bitcoin Classified by Personal Factors and Investor Groups

Personal Factors		Group of Investors			Total
		Amateur	Serious Speculators	Investors for Diversification	
Gender	Male	53.27	**79.46***	**73.02***	64.01
	Female	**46.73***	20.54	26.98	35.99
Age	Less than 23 years old	10.75	5.36	**15.87***	10.03
	39-32 years old	72.90	79.46	77.78	75.58
	years old or higher 40	16.36	15.18	6.35	14.40
Marital status	Single	71.96	66.07	**79.37***	71.47
	Married	26.17	**33.93***	20.63	27.51
	Divorced/Separated	1.87	0.00	0.00	1.03
Highest education level	Undergraduate	20.09	21.43	19.05	20.31
	Bachelor's Degree	59.35	**66.07***	49.21	59.64
	Master's Degree or higher	20.56	12.50	**31.75***	20.05

Table 3: Percentage of Investors in Bitcoin Classified by Personal Factors and Investor Groups
(cont.)

Personal Factors		Group of Investors			Total
		Amateur	Serious Speculators	Investors for Diversification	
Occupation	Students	14.02	8.04	14.29	12.34
	Government officials/ state enterprises	9.35	**23.21***	6.35	12.85
	Officer	26.17	25.00	19.05	24.68
	Investor / Private	35.98	31.25	**60.32***	38.56
	Business	14.49	12.50	0.00	11.57
	Retired and others				
Income/ month	Below 15,000 baht	21.96	21.43	19.05	21.34
	30,000-15,001 baht	29.44	**44.64***	23.81	32.90
	45,000-30,001 baht	**22.43***	8.04	6.35	15.68
	60,000-45,001 baht	13.08	10.71	6.35	11.31
	75,000-60,001 baht	3.74	3.57	0.00	3.08
	75,001 baht or more	9.35	11.61	**44.44***	15.68
Investment experience before investing in Bitcoin	Never invested before	97.54	45.54	17.46	41.13
	Used to invest before	12.45	54.46	**82.54***	58.87
	- Debt instruments	81.7	8.46	13.79	9.30
	- Equity instruments	44.71	16.15	18.97	17.46
	- Derivative	62.01	10.00	12.93	10.88
	- Mutual fund	62.03	24.62	24.14	26.98
	- Real estate	96.7	10.00	6.90	8.16
	- Gold	81.72	30.77	23.28	27.21
	Duration of investment (year)	3.03	2.21 ↑	3.12 ↓	2.83 ↑

Table 3: Percentage of Investors in Bitcoin Classified by Personal Factors and Investor Groups (cont.)

Personal Factors		Group of Investors			Total
		Amateur	Serious Speculators	Investors for Diversification	
Domicile	Bangkok and vicinity	54.67	43.75	**60.32***	52.44
	Northern region	7.01	1.79	1.59	4.63
	Southern region	7.94	13.39	11.11	10.03
	Eastern region	8.41	**17.86***	12.70	11.83
	Northeastern region	6.07	13.39	7.94	8.48
	Western region	5.14	2.68	0.00	3.60
	Central region	10.75	7.14	6.35	9.00

Note: * Outstanding

↑ More than total average

↓ Less than total average

Group 1, Amateur Investors, are mostly male (53.27%), more than 70% are between 23-39 years old, and more than half are single. More than half are graduates with a bachelor's degree (59.35%). Investors have a career as an investor/ private business at 35.98% follow by officer at 26.17%. Investors in this group have an average income at 15,001-30,000 baht (29.44%), and 54.21% have experience investing before investing in Bitcoin. Of this amount, most have invested in various types of mutual funds followed by gold (30.26% and 27.18% respectively). On average, investors in this group have investment experience of 3.03 years, which is more than the total average, and most live in Bangkok and its vicinity. When considering characteristics, Group 1 had outstanding characteristics, which is that it has a high level of female investors and an average monthly income of 30,001-45,000 baht. Group 2, Serious Speculators, almost 80% are male and aged between 23-39 years. Most (66.07%) are single and have graduated with a bachelor's degree. In this group, 31.25% have a career as an investor/own their own business. Almost half (44.64%) have average monthly income of 15,001-30,000 baht. Most have

experience in investing before investing in Bitcoin (54.46%). Most of these have invested in gold and various types of mutual funds (30.77% and 24.62%, respectively). Investor's in this group have an average investment experience of 2.21 years which is less than the total average and most live in Bangkok and its vicinity. In addition, it was found that the characteristics of investors in Group 2 are married male investors, have graduated with a bachelor's degree, are government officials/state enterprises with an average monthly income of 15,001-30,000 baht and live in the eastern region of Thailand.

Group 3, Investors for Diversification, more than 70% are male investors, aged between 23-39 years old and single, and 49.21% have graduated with a bachelor's degree. More than half (60.32%) is an investor/private business, and the highest average monthly income is 75,001 or more (44.44%). Almost all (82.54%) had previous investment experience. These had invested in various types of mutual funds and gold at a similar proportion (24.14% and 23.28% respectively). They had an average investment experience of 3.12 years, which is more than the total average. Most live in Bangkok and its vicinity. It was also found that investors in Group 3 have outstanding characteristics, which is they are primarily male investors, and many are younger than 23 years old. Most investors in this group are single and have a master's degree or higher. They have a career as an investor/private business with an average monthly income of 75,001 baht or more, have experience investing before investing in Bitcoin, and live in Bangkok and its vicinity.

Table 4: Percentage of Investors in Bitcoin Classified by Investment Behavior and Investor Group

Investment Behavior		Group of Investors			Total
		Amateur	Serious Speculators	Investors for Diversification	
Type of Bitcoin Wallet	Desktop Wallet	12.86	15.30	24.07*	16.31
	Mobile Wallet	29.90	24.04	27.16	27.59
	Paper Wallet	7.07	5.46	7.41	6.71
	Hardware Wallet	13.83	20.77	17.90	16.77
	Web Wallet	35.70	33.33	23.46	32.01
	Others	0.64	1.0	0.00	0.61
Main co-investor	Without co-investor	78.97*	63.39	60.32	71.47
	Family	11.21	25.89*	33.33*	19.02
	Friend	8.88	10.71	6.35	9.00
	Others	0.93	0.00	0.00	0.51
Study of risks and returns before investing	Never studied	7.94	3.57	6.35	6.43
	Quite a few studies	23.36	19.64	6.35	19.54
	Moderate study	52.80	47.32	36.51	48.59
	Study in detail	15.89	29.46	50.79*	25.45
The proportion of initial capital used to invest in Bitcoin	Less than 10%	47.66*	23.21	31.75	38.05
	10%-30%	32.24	46.43*	23.81	34.96
	31%-50%	8.88	15.18	20.63*	12.60
	More than 50%	11.21	15.18	23.81*	14.40
Characteristics of initial capital	Divided from the original capital	45.33	42.86	49.21	45.24
	New capital	54.67	57.14	50.79	54.76
The primary source of capital to invest in Bitcoin for the first time	Saving	86.45	85.71	80.95	85.35
	Loan	4.67	10.71	6.35	6.68
	Empty money from other people	8.88	3.57	12.70	7.97

Note: * Outstanding

Table 4: Percentage of Investors in Bitcoin Classified by Investment Behavior and Investor Group (cont.)

Investment Behavior		Group of Investors			Total
		Amateur	Serious Speculators	Investors for Diversification	
Expected return on investment	Less than 10%	13.08	7.14	0.00	9.25
	10%-30%	31.78	29.46	19.05	29.05
	31%-50%	15.89	15.18	12.70	15.17
	More than 50% or more	39.25	48.21	68.25*	46.53
Acceptable loss	Less than 10%	33.18	43.75*	19.05	33.93
	10%-30%	29.91	25.89	17.46	26.74
	31%-50%	16.36	4.46	26.98*	14.65
	More than 50%	20.56	25.89	36.51*	24.68
Return on investment in the past 1 year	Huge profit	9.35	3.57	46.03*	13.62
	Moderate profit	21.96	27.68	28.57	24.68
	Low profit	17.76	35.71*	6.35	21.08
	at par	25.23*	17.86	6.35	20.05
	Huge loss	11.21	3.57	6.35	8.23
	Moderate loss	7.48	7.14	6.35	7.20
	Low loss	7.01	4.46	0.00	5.14
Other digital funds invested in addition to Bitcoin	No investment	36.45	36.61	30.16	35.48
	Have invested by investing in	63.55	63.39	69.84*	64.52
	- Ethereum (ETH)	40.82	42.00	44.44	41.81
	- Ripple (XRP)	23.97	20.67	14.44	21.30
	- Litecoin (LTC)	25.84	26.67	24.44	25.84
	- other	9.36	10.67	16.67*	11.05

Note: * Outstanding

Table 4: Percentage of Investors in Bitcoin Classified by Investment Behavior and Investor Group (cont.)

Investment Behavior		Group of Investors			Total
		Amateur	Serious Speculators	Investors for Diversification	
Decision to invest in Bitcoin after 1 year	**Continue investing because;**	86.45	87.50	62.54	86.12
	- High return	49.19	**61.22***	**59.62***	54.33
	- Diversify investment risks	33.51	26.53	30.77	31.04
	- Increase the channel of payment	8.65	8.16	7.69	8.36
	- Others	8.65	4.08	1.92	6.27
	Not continue because;	13.55	12.50	17.46	13.88
	- Very volatile	**75.86***	**92.86***	27.27	70.37
	- No legal support yet	20.69	7.14	**72.73***	27.78
	- Other	3.45	0.00	0.00	1.85

Note: * Outstanding

Investors in Group 1 have chosen to use Web Wallet to store Bitcoins, followed by Mobile Wallet (35.70% and 29.90%, respectively), more than half (78.97%) invested by the no-co investor. There is a modest study of risk and return before investment (52.80%) by 47.66%, with the initial capital ratio that is used to invest in Bitcoin less than 10%. The money invested that is new money added came from 54.67% and 86.45% of savings, most of which needed more than 50% or more but accepted the loss of less than 10% (39.25% and 33.18% respectively). From the investment in 1 year, most investors (25.23%) have a return on investment at par and 63.55% with investment in other digital currencies along with it. Of these, most invest in Ethereum (40.82%) and 86.45% of the investors in this group decide to invest in Bitcoin after this 1 year. When considering the

characteristics of investors in Group 1, the researcher found that this group has the outstanding characteristic that only one person invests. In addition, the proportion of initial capital invested in Bitcoins is less than 10%. The return on investment is at par and the number of investors who decide not to invest in Bitcoin after this 1 year as it is too volatile.

Investors in Group 2 mostly store Bitcoin by choosing to use Web Wallet at 33.33% followed by Mobile Wallet at 24.04%. Interestingly, more than half (63.39%) invested in Bitcoin and also modestly studied the risks and returns before investment (47.32%). The initial capital used to invest in Bitcoin accounted for 10%-30% (46.43%). Also, 57.14% was new sources of funding added. The research also found that up to 85.71% of the saving was used for first time Bitcoin investment. Also interestingly, 48.21% of investors in this group expect more than 50% return but accept less loss. From the investment in the past 1 year, 35.71% of investors gained less profit. Additionally, 63.39% have invested in other digital currencies together with Bitcoin investment. Most other digital currency investments are Ethereum at 42.00% and 87.50% invested in Bitcoin after this 1 year. Investors in Group 2 have as an outstanding feature that they have family as an investor with an initial capital ratio used to invest in Bitcoin at approximately 10%-30%. They are also able to accept losses of less than 10%. From investments over the past one year they had little profit. Investors who decide to continue investing do so because of high returns expectation compared to other investment sources, while investors who decide not to invest further argue that Bitcoin is too volatile.

Group 3 investors mostly use Mobile Wallet and Desktop Wallet (27.16% and 24.07%, respectively). The research results also found that 60.32% of investors invested without co-investors. Most investors at 50.79% studied the risks and returns in detail before investing. Also, the initial capital ratio that was used to invest in Bitcoin was less than 10% (31.75%), which is a new capital of 50.79%. In this group only, more than 80% of investors use savings as the main capital used to invest in Bitcoin. Most expect a return on investment and accept losses of more than 50% or more (68.25% and 36.51%, respectively). From investment in the past one year, 46.03% had a substantial profit and invested in other digital

currencies up to 69.84%. Of this, most invested in Ethereum at 44.44%, and 62.54% decided to continue investing in Bitcoin. When considering the outstanding characteristics, investors in Group 3 choose Desktop Wallet to store Bitcoin and invested with family. The proportion of initial capital that is used to invest is more than 30%. They expect more than 50% returns and accept more than 30% losses. There are substantial investment gains, and there is an investment in a digital currency other than Bitcoin and investors who decide to invest in Bitcoin continue because it has a high return on investment. However, investors who do not decide to continue investing argue that Bitcoin is not yet legal.

Table 5: Mean and Standard Deviations of Investors Classified by Investment Behavior and Investor Group

Investment Behavior	Group of Investors			Total
	Amateur	Serious Speculators	Investors for Diversification	
Average Bitcoin trading (times per week)	2.71 (3.46)	2.35 (1.81)	4.02 (3.55)	2.84 (3.22)
Number of hours of average mining (hours per day)	24.00 (0.00)	18.89 (8.44)	19.56 (7.18)	19.23 (8.00)

Note: The values in parentheses are standard deviation

Mean and standard deviation of investors, classified by investment behavior and investor groups, found that Amateur Investors (Group 1) and Serious Speculators (Group 2) have trade averages of 3-2 times per week while Investors for Diversification (Group 3) have the highest average Bitcoin trading at 4 times a week. Moreover, investors in Group 1 who mine Bitcoin excavate throughout the day or for 24 hours. Investors in Groups 2 and 3 have an average of 19 hours of mining a day.

Conclusion and Recommendations

Investing in Bitcoin is similar to stock investments in that investors can receive rewards or profit from price differences. The difference is that Bitcoin is not yet

supported as an asset that can be used to pay debts according to the law. However, investing in Bitcoin can be done, and the state has no prohibition or exclusion. Therefore, investors should study Bitcoin investment tactics before investing in order to ensure that their investment is secured.

Based on an analysis of the results, it can be seen that the behavior of Thai investors investing in Bitcoin of each group is different. Amateur Investors mostly start investing in Bitcoin when they are students, with the youngest investor found in this group being 15 years old. Therefore, all levels of education should provide instruction on investment tactics, methods, and also investment risks to students. Moreover, investors aged over 40 years account for a higher proportion of this group than the other groups, with the oldest investor being 63 years old. These investors should be careful about investing in Bitcoin as its fluctuations may impact on their retirement savings.

Investors in Group 2 are serious speculators who have an outstanding characteristics in terms of being domiciled in the eastern region have less investment in Bitcoin than the total average and also have the lowest monthly income. Therefore, they should be cautious when investing in highly volatile assets and there should be a government policy to establish knowledge centers in different regions of the country to allow people to access information including accurate and appropriate advice in a more convenient and timely manner. Investors in Group 1 and Group 2 who are business operators trading in Bitcoin and/or other digital currencies should be encouraged to make additional investments through methods such as reward programs for high levels of trading Bitcoin within the time limit or there be waiving of fees or bonuses.

Investors in Group 3 invest for diversification, possess long-term investment experience, have knowledge and ability, and have the highest income and possession level of Bitcoin. However, investors in this group should limit their investment in Bitcoin due to the fluctuations in its value according to demand. If in the future the demand for Bitcoin declines or it is replaced by the new cryptocurrency, the value of their Bitcoin investment may depreciate considerably.

Furthermore, many countries do not support Bitcoin currencies and the countries that currently support it may, in the future, no longer support it, which could result in a decrease in the Bitcoin price. Bitcoin investors may be affected by these factors, and Bitcoin trading operators and other cryptocurrencies should propose strategies for reducing costs associated with trading such as reducing transaction fees when purchasing Bitcoin if they wish to encourage investors over both the short and longer term.

Recommendations for Further Research

Further research should expand the scope of study to include investment behavior in other cryptocurrencies and investigate investors' behavior in all regions of Thailand. Such research would facilitate the analysis and comparison of the data collected on a region by region basis.

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