

Article

Functions of Currency before and after COVID-19: Is Bitcoin Sustainable for Tourism?

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Abstract: The specific purposes of this study are (1) to analyze whether there is a difference in the recognition of tourists in the functions of currency according to the type of currency spent by tourists before and after COVID-19; (2) to identify why tourists employ Bitcoin among the functions of currency; and (3) to identify tourists' intentions to continue to using Bitcoin according to the degree of recognition of the function of virtual currency in Korea. Both quantitative and qualitative methods, including a one-way analysis of variance, a paired *t*-test, a simple regression analysis, and an in-depth interview, were employed. One of the conclusions implies that tourists in a tourism destination still prefer paying with cash rather than paying with card or virtual currency. Moreover, the study discovered that tourists count more on virtual currency and prepare for a future with virtual currency when a factor that has an unstable impact on social economy, such as COVID-19, happens. As to the functions of Bitcoin, tourists appeared to place a great importance on its storage, value, satisfaction, convenience, and investment. Additionally, the study showed that tourists intend to continue using Bitcoin due to the same satisfaction, convenience, and investment attributed to Bitcoin. More discussion and implications were provided.

Keywords: virtual currency; Bitcoin; functions of currency; COVID-19; tourists



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1. Introduction

As a universal phenomenon, the field of tourism and hospitality has grown alongside the remarkable burgeoning of the industry and within the academic world. The field achieved new heights with both the quality and quantity of research in the 2000s [1,2]. As evidence for the accomplishments of tourism research, there were only three journals, namely, *Tourism Management*, the *Annals of Tourism Research*, and the *Journal of Travel Research*, registered in the Social Science Citation Index (SSCI) until the 1990s, while the number of journals registered in the SSCI, as of 2021, has increased to more than 20 academic journals [3–5]. Even though there are several fields in the tourism and hospitality context such as development and management of tourism, researchers have particularly paid much attention to the outstanding development of tourism economies among them [6]. Compared to other research fields, the reason tourism economy has received considerable interest from both academia and within the industry is reflected in unstable factors, including the conditions of the global and domestic economy [7]. Since the 1980s, the trends of research pertaining to the tourism economy are typically classified into three research topics that involve a study on the analysis of supply and demand of tourism [8–16], an analysis of the ripple effect of tourism [17], and an evaluation of tourism resources [18,19].

Despite the steady development of the tourism field along with the economics of tourism and outdoor recreation, topics of research in the tourism economy are predominantly leaning toward the three sectors as described earlier. With an economic and

sociocultural approach, studies on tourism have also been attempted. Particularly, those related to Bitcoin research, such as the development of a TAM (Technology Acceptance Model), an analysis of the pros and cons of virtual currency, and an intention to use Bitcoin as a payment option, are among the newer studies in the tourism context [20–23]. More recently, why Bitcoin, as a research topic, has been paid attention is because there are a large number of Bitcoin users and earners. According to the Chainanalysis (2021) [24], investors from the USA were the first ranked for 2020 in terms of estimated realized Bitcoin earnings, followed by China, Japan, the UK, Russia, Germany, France, Spain, and Korea in order among the leading 25 countries. Additionally, modern monetary theory has been discussed by economists and researchers, and a wide series of studies on the function and transition of money have been conducted in the field of economics [25,26]. However, in spite of the outbreak of COVID-19, it still falls short of much research in the functions of virtual currency, which has been a payment method for tourists both before and after COVID-19. Due to the importance of the COVID-19 pandemic, there is a plethora of research on the pandemic disease linked with tourist behavior [27–29]. Both a case study of Andalusia in Spain analyzing tourist sentiment and an analysis of determinants influencing decision making for tourism journeys during the COVID-19 pandemic are exemplified [30,31].

Although there are many studies that have been analyzed on tourists in the field of tourism economics and tourist behavior, as well as several works that have been conducted in virtual currencies [20–23], this study was performed focusing on three key terms, virtual currency, tourists, and sustainable intention to use Bitcoin, which have received less attention. The specific purposes of this study derived from the aforementioned research problem are as follows: First, this study endeavors to analyze whether there is a difference in the perception of tourists, before and after COVID-19, in the functions of currency according to the type of currency spent by tourists, that is, cash, credit or debit card, and Bitcoin as a virtual currency. Second, through qualitative and quantitative research methods, this study attempts to identify why tourists employ Bitcoin among the functions of currency. Finally, this study analyzes the sustainable usage intention of Bitcoin, which seems to be the most important issue under the unstable economy over the world, and tourists' intentions to continue using Bitcoin according to the degree of recognition of the function of virtual currency. The results from this analysis appear to be interesting and worrisome because traditional currencies such as cash seem to disappear by means of the continuous usage of virtual currencies. Ultimately, these results can lead to an issue of whether traditional currencies exist or are substituted for virtual currencies.

2. Literature Review

2.1. Functions of Currency

The purposes of this study are to analyze whether there is a difference in the function of currency perceived by tourists before and after the outbreak of COVID-19, why tourists use Bitcoin as a virtual currency among several functions of currency, and if tourists have a sustainable intention employing Bitcoin according to the functions of currency. In order to achieve these purposes, it is necessary to take a brief look at the functions of money. According to the extant literature on financial economics, the functions of money are typically divided into the three sections, that is, the medium of exchange, the store of value, and the unit of account, regardless of the physical form of currency [32]. First of all, currency has a function of exchange among the functions of money. It is a medium of economic exchange that takes place between and among individuals and companies in market transactions [33]. Since this study briefly discusses the functions of currency, it will not provide an in-depth take on the Austrian School and Marxism associated with currency. According to the Austrian School and Marxism, however, currency is an outcome of a spontaneous order that emerges naturally in the process of exchange of commodities [34–36].

Second, currency has a function of storing value. According to Knapp (1924) [35], the commodity of currency is a token or symbol that stores or transfers the abstract value

of currency per se, regardless of the tangible commodity. In addition, currency has the characteristics of individual property as an object of storage of value [37]. Third, among the functions of currency, the measure of the value of currency is originated from the exchange of goods in the market. In the theory of money, which was argued by the Austrian school and Marxism, money was created from the exchange of goods in the market. The theory of money is a market model in which a common medium of exchange spontaneously emerges in barter, and that money is the materiality of value [36]. In other words, if a commodity replaces the role of money, it is because a commodity per se has value.

In addition to the three functions of currency discussed in the existing literature, this study intends to add satisfaction, convenience, and investment as extra functions of currency. This is because the functions of currency have changed due to the recent emergence of virtual currency unlike the three traditional characteristics that currency has. For example, it is because Bitcoin that has a characteristic of investment is considered a new type of financial asset or financial investment product that has not been experienced as a currency so far [32,36,38,39]. In addition, virtual currency is not a tangible currency unlike extant currencies, and it has the convenience of making payments anywhere in the world without intervention of government or financial institution as long as the other party has the intention to receive the virtual currency [36]. Lastly, assuming that intangible virtual currency is a commodity in the transaction, individual satisfaction involved by possession of currency is able to be another special function of currency because currency has the characteristics of satisfying materialistic desire of human beings [37].

Based on literature review and discussion, the following hypotheses were provided:

Hypothesis 1 (H1). *There will be differences of means in the functions of cash recognized by the three different groups at a tourism destination.*

Hypothesis 2 (H2). *There will be differences of means in the functions of card recognized by the three different groups at a tourism destination.*

Hypothesis 3 (H3). *There will be differences of means in the functions of Bitcoin recognized by the three different groups at a tourist destination.*

Hypothesis 4 (H4). *There is a difference of means in the functions of Bitcoin recognized by tourists before and after COVID-19.*

2.2. Changes of Means of Payment

The most popular topic pertinent to currency in recent years is by far the validity of Bitcoin as one of virtual currencies. Since virtual currency did not appear without any notice but was changed from extant currency by social changes and demands, it requires users to understand the process of transition before the emergence of virtual currency. From a system of barter before physical currency was created and widely distributed to the world, to coins made of metal, to credit currency including banknotes and credit cards, to digital currency and virtual currency, currency has changed in response to social changes and technological development. Tools created to improve the inefficiency of bartering that carries large and small goods in person is the beginning of currency. These tools, made of animal skins, feather, bones, shells, arrowhead, silk, and the like, depend on the times and areas [34,40]. Extant literature accounts for various currencies having been used depending on the times and regions, but both gold and silver are the currencies for transactions of commodity that have been applied for the longest and across the widest areas in the history of mankind. Gold and silver possess the characteristics that represent all contemporary currency: portability, stability, durability, scarcity, and divisibility [40]. In addition, gold and silver were more competitive as monetary tools than other currencies. They could be widely employed because they had inherent values irrespective of the issuer of the currency. Throughout ancient times that could produce coins as a substitute for gold and silver, such as in the Kingdom of Lydia in Asia Minor

around 600 B.C., recently banks as financial institutions began to emerge, and credit currencies such as credit or debit cards issued by financial institutions were created and spread abroad [40,41]. Under this condition of the widespread use of banknotes and credit or debit cards, technologies, such as computers and the Internet, began to develop, and analog systems were replaced with digital systems by and large. This digitization of the world occurred in currency transactions, and the development of currency transactions and payment methods accompanied by the convenience of currency has been promoted. It is obvious that the digitalization of finance has several advantages, while it also has the disadvantages of not being able to completely provide financial safety due to issues such as the hacking of personal accounts and the leakage of personal information [42].

The system of electronic currency, Bitcoin, uses a peer to peer (P2P) network to protect information security, the personal information of financial services under the current weaknesses of financial services, and to enable online payments and transactions between individuals without the intervention of the government and financial authorities [42,43]. In addition, it is evident, to some extent, that the emergence of Bitcoin reflects the distrust of the government and financial authorities that have issued the currencies and that have caused the financial crisis, such as the subprime mortgage crisis that occurred in 2008 [44,45]. The advent of Bitcoin stimulated the development of other digital currencies, and Bitcoin encouraged ‘decentralized and digital monetization’ without the intervention of government to establish a monetary order and monopolize currency [46]. The emergence of such digital currency reflects the change and a new paradigm of currency with the passage of time [22]. This study, therefore, was conducted under the assumption that current common currencies for exchange and payment methods are cash, card, and Bitcoin.

Based on literature review and discussion, the hypotheses were developed as follows:

Hypothesis 5 (H5). *The exchange of Bitcoin will have a significantly positive effect on intention to continue to use it.*

Hypothesis 6 (H6). *The storage of Bitcoin will have a significantly positive effect on intention to continue to use it.*

Hypothesis 7 (H7). *The value of Bitcoin will have a significantly positive effect on intention to continue to use it.*

Hypothesis 8 (H8). *The satisfaction of Bitcoin will have a significantly positive effect on intention to constantly use it.*

Hypothesis 9 (H9). *The convenience of Bitcoin will have a significantly positive effect on intention to constantly use it.*

Hypothesis 10 (H10). *The investment in Bitcoin will have a significantly positive effect on intention to constantly use it.*

2.3. Recent Issues of Bitcoin as a Virtual Currency

Since the birth of Bitcoin, issues associated with Bitcoin have been constantly discussed from the early 2000s to the present. Although there are many controversies over Bitcoin, the biggest attention is the issues on both avoiding the payment of tax and being abused by criminal groups [47]. These two arguments about Bitcoin are summarized as follows. First, it is a problem of tax payment according to the transaction of Bitcoin between individuals [48]. Even though Bitcoin is currently receiving great attention for investment or stockjobbing, the initial purpose of creating Bitcoin is neither of them. As addressed in Nakamoto’s (2008) [43] report, one of the objectives of Bitcoin’s development is to promptly spend and receive virtual currency between individuals online without the intervention of financial sectors. The advantages of using Bitcoin are that it is convenient, and it does

not require a charge of currency exchange when trading currency, especially when trading foreign exchange in different countries [36].

Meanwhile, due to a boom in investment and stockjobbing of Bitcoin in recent years, the value per Bitcoin surged from less than USD 10 in early 2000 to more than USD 60,000 in March 2021. However, a surge in the value of Bitcoin is because it was reported that Elon Musk, founder of Tesla, would receive Bitcoin as a means of transaction for the sale of Tesla automobiles in February 2021. It is undeniable that a drastic rise in the value of Bitcoin is derived from an unimaginable popularity of investing Bitcoin in Asian countries such as Korea, Japan, and China [49,50]. In addition, in the case of Korea, Bitcoin is unusually paid attention to as a substitute for stocks, not as a currency as a means of market exchange. In the situation of economic downturn due to the outbreak of COVID-19, investors in Korea became interested in Bitcoin after a boom of the stock investment, thereby flowing down over an upsurge in investing virtual currencies. Not only Korean government and financial authorities but also those in other countries were observing transactions of Bitcoin. The Korean government has eventually decided that even if it is a transaction between individuals who own virtual currencies, some of the profits from transactions of virtual currencies should be paid as tax.

Second, the most distressing part of each country is a case that Bitcoin is abused by criminal groups [51]. Currently, since the transaction of Bitcoin is a business between individuals without governmental intervention, it is considerably difficult to confirm details about the transactions of Bitcoin. As such, Bitcoin can be used for illegal purposes such as drug trafficking, arms trade by terrorists, and money laundering. As an example, computer hackers will spread fatal ransomware to personal computers and demand Bitcoin in exchange for the removal of the ransomware [52,53]. There are advantages to using virtual currency, but there are also side effects of using it, and as a result, governments of all countries continue to focus on virtual currency.

Beyond the practical and social issues of Bitcoin, academic researchers have contributed to the literature on virtual currency within the tourism context [20–23]. Specifically, several studies on Bitcoin as a payment method have been discussed. A study has stressed that Bitcoin will play an important role between tourists and service providers in the tourism industry if an issue of compatibility happens under an extant mechanism of payment [20]. In addition, in a study with European travelers, respondents have answered that they will employ Bitcoin in purchasing tourism products online in the future [22]. Another study has echoed both the advantages and disadvantages of Bitcoin along with the functions of security and anonymity which virtual currencies involve, except for the three basic functions of currency such as a medium of exchange, the measure of value, and the store of value [21]. A recent study has made an effort to disclose a framework of experiential loyalty intentions under a setting of Bitcoin travel in Brisbane Airport, Australia [23]. As a result, using Bitcoin enables positively interacting with both tourists and service organizations mutually in aspects of experiential satisfaction and trust. Other than this academic research, there are a bundle of world news stories of families, as an example, Didi Taihuttu's family, traveling over the world using Bitcoin [54].

3. Methodology

3.1. Instrument

Internationally, there is a controversy over whether the first outbreak of COVID-19 in Wuhan, China, was in November or December 2019, but the spatio-temporal scope of this study is limited to Korea. Therefore, questionnaires were analyzed before and after 20 January 2020, when the first patient infected by COVID-19 in Korea occurred. The sections of the questionnaire are as follows: (1) whether or not Bitcoin is used in overseas destinations for the purposes of tourism before and after COVID-19, (2) the degree of recognition of function of cash when using cash, (3) the degree of recognition of function of card when using a credit or debit card, (4) the degree of recognition of function of Bitcoin when using Bitcoin, (5) among the functions of currency, the reasons for using

Bitcoin, (6) intention to continue to use of Bitcoin according to the functions of currency, and (7) demographic profiles such as residence, age, gender, occupation, and monthly income. Because this study is the first exploratory and empirical study, a question of whether respondents employ Bitcoin in overseas destinations for the purpose of tourism before and after COVID-19 is a nominal scale, questions of demographic characteristics are either nominal or ordinal scales, and the rest of questions consists of 7-point Likert scales (1 = strongly disagree, 7 = strongly agree) [55].

3.2. Data Collection and Statistical Analyses

The population of this study is those tourists who have used Bitcoin. As it was judged that there were difficulties in collecting census data, a convenient sampling method was employed. Data collection was conducted in Korea, and a total of 400 questionnaires were distributed to the e-mail addresses of Bitcoin users in July 2020 to complete a self-administered questionnaire online. The surveys were collected by e-mail by the end of August 2020, and of 400 surveys, a total of 388 were analyzed, excluding 12 unusable surveys with missing values. The e-mail addresses of the Bitcoin users have been obtained when other research in the issue of Bitcoin was carried out in February 2017 in Seoul and Seongnam cities, Korea. Throughout this information, both distribution and receipt of questionnaires were accomplished. Initially, data collection would plan to be conducted at two spots in the Sedona of a coffee shop where the first domestic Bitcoin ATM is located on the second basement floor of the COEX, Seoul, Korea, in March 2014 and on the fifth floor of the Gyeonggi Creative Economy Innovation Center with another Bitcoin ATM, Seongnam city, Korea. It, however, was unachievable to collect on-site data because all domestic Bitcoin ATMs were removed. No Bitcoin ATMs are found in Korea at present, and locations of Bitcoin ATMs around the world can be provided through the Bitcoin ATM Map (<https://coinatmradar.com/>, accessed on 22 July 2020).

To analyze the collected data, the SPSS 22.0 version of the statistics program was used, and analytic steps are as follows. To begin with, a frequency analysis was conducted to identify the characteristics of the sample, and a one-way analysis of variance was performed to analyze whether there is a difference in the degree of recognition of function of the currency according to the type of currency used by tourists. Additionally, a paired t-test was carried out to analyze whether there is a difference in the degree of recognition of function of virtual currency by tourists before and after COVID-19. Second, together with quantitative analyses, to analyze what function of currency tourists use Bitcoin for, interviews were conducted for in-depth content analysis. Interviews were completed with 10 respondents by e-mail and phone after asking for their intention to interview and receiving the consent of the respondents when collecting online questionnaires in this study. Questions for interview focused on what reason tourists utilize Bitcoin with respect to the function of currency. Third, a simple regression analysis was attempted to analyze whether tourists will sustainably use it according to the functions of currency that Bitcoin owns, that is, exchange, storage, value, satisfaction, convenience, and investment.

4. Results

4.1. Demographic Characteristics

The demographic characteristics for the sample were identified through frequency analysis. First of all, as for the residence of the respondents, the majority of respondents were from and around Seoul city, specifically 146 (37.6%) residents in Seoul and 110 (28.4%) in Kyonggi Province, Korea. In addition, there were 35 (9.0%) residents in Incheon city, 21 (5.4%) in Busan city, 12 (3.1%) in Daegu city, and 12 (3.1%) in Jeju island. As for the age of respondents, there were 124 (32.0%) respondents in their 40s, 103 (26.5%) in their 30s, 92 (23.7%) in their 50s, 49 (12.6%) in their 60s, 16 (4.2%) in their 20s, and 4 (1.0%) who were over 70; accounting for that, most of the respondents were in their 30s and 40s. Regarding the gender of the respondents, there were 341 males (87.9%), while there were 47 females (12.1%). The occupation of the majority of respondents was 189 (48.7%) self-employed.

There were 103 (26.5%) professionals, 55 (14.2%) clericals, 18 (4.6%) housewives, 16 (4.1%) students, 5 (1.3%) sales and service workers, and 2 (0.5%) officials. The monthly income was the highest with 108 (27.8%) respondents earning USD 7000–7999, followed by 78 (20.1%) with USD 5000–5999, followed by 52 (13.4%) with USD 8000–8999, followed by 51 (13.1%) with USD 6000–6999, followed by 43 (11.1%) with USD 4000–4999, followed by 23 (5.9%) with USD 2000–2999, followed by 20 (5.2%) with USD 3000–3999, and finally followed by 13 (3.4%) with USD 1000–1999 (Table 1).

Table 1. Demographic Information for the Sample.

Category	Sub-Category	Frequency (N = 388)	Percentage (%)
Residence	Seoul	146	37.6
	Kyonggi	110	28.4
	Incheon	35	9.0
	Daejeon	6	1.5
	Sejong	6	1.5
	Kwangju	9	2.3
	Deagu	12	3.1
	Ulsan	4	1.0
	Busan	21	5.4
	Kangwon	4	1.0
	Jeju	12	3.1
	Chungnam	4	1.0
	Chungbook	4	1.0
	Jeonbook	3	0.8
	Jeonnam	4	1.0
	Kyongbook	4	1.0
	Kyongnam	4	1.0
Age	20s	16	4.2
	30s	103	26.5
	40s	124	32.0
	50s	92	23.7
	60s	49	12.6
	Over 70s	4	1.0
Gender	Male	341	87.9
	Female	47	12.1
Occupation	Sales and Service	5	1.3
	Housewife	18	4.6
	Self-employed	189	48.7
	Professional	103	26.5
	Official	2	0.5
	Student	16	4.1
	Clerical	55	14.2
Monthly income (Unit: USD)	1000–1999	13	3.4
	2000–2999	23	5.9
	3000–3999	20	5.2
	4000–4999	43	11.1
	5000–5999	78	20.1
	6000–6999	51	13.1
	7000–7999	108	27.8
	8000–8999	52	13.4

4.2. One-Way ANOVA

One-way analysis of variance was used to analyze whether there are differences of means in the six functions of cash as a currency recognized by each group of tourists who mainly use cash, cards, and Bitcoin in a tourism destination. As a result, it turned out that at a 0.1% significance level, there were differences of means in all six functions of cash recognized by the three groups (Table 2).

Table 2. One-way ANOVA for the function of cash.

		Sum of Squares	df	Mean Square	F	Sig.	Homogeneity of Variance Test			
							Levene Statistic	df1	df2	Sig.
Cash										
Exchange	Between groups	55.818	2	27.909	11.229	0.000 ***	1.038	2	385	0.374
	Within groups	956.891	385	2.485						
	Total	1012.709	387							
Saving	Between groups	73.755	2	36.877	13.002	0.000 ***	0.303	2	385	0.821
	Within groups	1091.985	385	2.836						
	Total	1165.740	387							
Value	Between groups	90.649	2	45.325	17.720	0.000 ***	0.847	2	385	0.467
	Within groups	984.781	385	2.558						
	Total	1075.430	387							
Satisfaction	Between groups	252.865	2	126.433	47.773	0.000 ***	1.179	2	385	0.316
	Within groups	1018.916	385	2.647						
	Total	1271.781	387							
Convenience	Between groups	204.061	2	102.030	32.218	0.000 ***	1.313	2	385	0.268
	Within groups	1219.246	385	3.167						
	Total	1423.307	387							
Investment	Between groups	152.426	2	76.213	20.062	0.000 ***	1.655	2	385	0.192
	Within groups	1462.554	385	3.799						
	Total	1614.979	387							

Note: The Leven statistic is required to be insignificant at $\alpha = 0.05$. *** $p < 0.001$.

The detailed results of testing research hypotheses are as follows. The Hypothesis 1 that there will be differences of means in the functions of cash recognized by the three different groups at a tourism destination was accepted. As a result of conducting a post-hoc test with Tukey to find out what differences exist between the three groups, those who mainly used cash were more aware of the exchange of cash than those who mainly used cards at a 95% confidence level (CI[0.19, 1.12], $p < 0.05$). Likewise, it was significant that those who mainly used cash were more aware of the exchange of cash than those who mainly used Bitcoin at a 95% confidence level (CI[0.54, 2.34], $p < 0.05$). Regarding the recognition of the storage of cash, the group who mainly used cash was found to be significantly higher than the group who mainly using cards at a 95% confidence level (CI[0.54, 1.54], $p < 0.001$). In regard to the recognition of value of cash, it was found that the group mainly using cash was significantly higher than the group mainly using cards at a 95% confidence level (CI[0.72, 1.67], $p < 0.001$). Moreover, it resulted that the group who mainly used Bitcoin had a significantly higher recognition of the value of cash than the group who mainly used cards (CI[0.13, 2.09], $p < 0.05$).

With respect to the recognition of satisfaction with cash, the group who mainly used cash at a 95% confidence level was found to be significantly higher than the group who mainly used cards (CI[1.52, 2.49], $p < 0.001$). In addition, at 95% confidence level, it identified that the group mainly using Bitcoin had significantly a higher recognition of satisfaction with cash than the group mainly using cards (CI[0.69, 2.68], $p < 0.001$). In regard to the recognition of the convenience of cash, it was found that the group mainly using cash was significantly higher than the group mainly using cards (CI[1.27, 2.32], $p < 0.001$) at the 95% confidence level. Finally, in the recognition of the investment of cash, it showed that the group mainly using cash was significantly higher than the group mainly using cards at a 95% confidence level (CI[0.92, 2.08], $p < 0.001$). Furthermore, at a 95% confidence level, it resulted that the group mainly using cash had a significantly higher recognition of the investment of cash than the group mainly using Bitcoin (CI[0.04, 2.27], $p < 0.05$).

Similarly, the one-way analysis of variance was used to analyze whether there were differences of means between the three groups for the six functions of cards. As a result, it showed that among the six functions of cards at a 10% significance level, there was differences of means between the three groups in the convenience of cards. In addition,

at the 5% of significance level, the differences of means between the three groups were found in the satisfaction of card, whereas at the 0.1% significance level, the differences of means between the three groups was found in the value of cards (Table 3). The Hypothesis 2, therefore, that there will be differences of means in the functions of cards recognized by the three different groups at a tourism destination was partially accepted. Because it showed that there were significant differences of means between the three groups from the one-way analysis of variance, a post-hoc test with Tukey was performed, and its results were as follows. First, in the recognition of the exchange and storage of cards, no significant difference was found between the three groups at a 95% confidence level. Second, the group who mainly used cards was found to be significantly higher in recognition of the value of cards than the group mainly using cash at a 95% confidence level (CI[0.58, 1.65], $p < 0.001$). In addition, it showed that the group mainly using cards had a significantly higher recognition of the value of cards than the group mainly using Bitcoin at 95% of the confidence level (CI[0.22, 2.43], $p < 0.05$). Third, in the recognition of satisfaction with cards, the group who mainly used cards was found to be significantly higher than the group who mainly used cash at a 95% confidence level (CI[0.10, 1.29], $p < 0.05$). Fourth, in the recognition of the convenience and investment of cards, no significant difference was found between the three groups at a 95% confidence level.

Table 3. One-way ANOVA for the function of card.

		Sum of Squares	df	Mean Square	F	Sig.	Homogeneity of Variance Test			
							Levene Statistic	df1	df2	Sig.
Card										
Exchange	Between groups	1.621	2	0.810	0.863	0.423	1.087	2	385	0.353
	Within groups	361.356	385	0.939						
	Total	362.977	387							
Saving	Between groups	2.114	2	1.057	1.295	0.275	0.425	2	385	0.733
	Within groups	314.370	385	0.817						
	Total	316.485	387							
Value	Between groups	81.699	2	40.850	12.677	0.000 ***	0.806	2	385	0.447
	Within groups	1240.641	385	3.222						
	Total	1322.340	387							
Satisfaction	Between groups	30.310	2	15.155	3.732	0.025 **	2.049	2	385	0.105
	Within groups	1563.371	385	4.061						
	Total	1593.680	387							
Convenience	Between groups	8.380	2	4.190	2.493	0.084 *	0.655	2	385	0.578
	Within groups	647.105	385	1.681						
	Total	655.485	387							
Investment	Between groups	3.986	2	1.993	1.857	0.157	0.234	2	385	0.791
	Within groups	413.127	385	1.073						
	Total	417.113	387							

Note: The Leven statistic is required to be insignificant at $\alpha = 0.05$. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.

The study analyzed whether there are differences of means for the six functions of Bitcoin, virtual currency, as well as the core term of this study. As a result, there were differences of means between the three groups in the value and convenience of Bitcoin at a 10% significance level, while in the exchange, storage, satisfaction, and investment means at a 5% significance level (Table 4). The Hypothesis 3, therefore, that there will be differences of means in the functions of Bitcoin recognized by the three different groups at a tourist destination was accepted. Since there were significant differences between the three groups in the one-way analysis of variance, a post-hoc test with Tukey was performed. The results are as follows. First, it showed that the group that mainly used Bitcoin had significantly higher the recognition of exchange of Bitcoin than the group that mainly used cash at a 95% confidence level (CI[0.18, 2.18], $p < 0.05$). Second, in the recognition of storage and value of Bitcoin, no significant differences of means between the three groups were

found at a 95% confidence level. Third, at a 95% confidence level, the group mainly using Bitcoin was found to be significantly higher in the recognition of satisfaction of Bitcoin than the group mainly using cash (CI[0.28, 1.70], $p < 0.05$). Fourth, there were no significant differences of means between the three groups in the recognition of convenience of Bitcoin at a 95% confidence level. Finally, in the recognition of the investment of Bitcoin, it showed that the group mainly using Bitcoin was significantly higher than the group mainly using cash at a 95% confidence level (CI[0.06, 1.33], $p < 0.05$).

Table 4. One-way ANOVA for the function of Bitcoin.

		Sum of Squares	df	Mean Square	F	Sig.	Homogeneity of Variance Test			
							Levene Statistic	df1	df2	Sig.
Bitcoin										
Exchange	Between groups	26.058	2	13.029	4.247	0.015 **	2.047	2	385	0.103
	Within groups	1181.063	385	3.068						
	Total	1207.121	387							
Saving	Between groups	12.467	2	6.233	3.455	0.033 **	1.562	2	385	0.211
	Within groups	694.510	385	1.804						
	Total	706.977	387							
Value	Between groups	3.201	2	1.601	2.471	0.086 *	0.767	2	385	0.465
	Within groups	249.363	385	0.648						
	Total	252.564	387							
Satisfaction	Between groups	19.739	2	9.869	6.357	0.002 **	1.271	2	385	0.281
	Within groups	597.754	385	1.553						
	Total	617.492	387							
Convenience	Between groups	11.297	2	5.649	2.970	0.052 *	0.424	2	385	0.731
	Within groups	732.208	385	1.902						
	Total	743.505	387							
Investment	Between groups	13.495	2	6.748	5.384	0.005 **	0.302	2	385	0.820
	Within groups	482.512	385	1.253						
	Total	496.008	387							

Note: The Leven statistic is required to be insignificant at $\alpha = 0.05$. * $p < 0.1$, ** $p < 0.05$.

4.3. Paired t-Test

A paired *t*-test was conducted to identify whether there are differences of means in the functions of Bitcoin, as a currency, recognized by tourists before and after COVID-19. As a result of the analysis, the significant differences of means between the two groups showed in the storage, value, and satisfaction of Bitcoin at a 5% significance level. After COVID-19, the storage and value of Bitcoin recognized by tourists showed a higher mean than those recognized by tourists before COVID-19 at a 5% significance level. On the other hand, in the satisfaction of Bitcoin, the mean of the satisfaction of Bitcoin before COVID-19 was higher than its mean after COVID-19. The Hypothesis 4, therefore, that there is a difference of mean in the functions of Bitcoin recognized by tourists before and after COVID-19 was partially accepted (Table 5).

4.4. Reasons Why Bitcoin Is Used

In order to find concrete answers on why tourists use Bitcoin, both in-depth interviews and a frequency analysis from the surveys were conducted. The surveys and interviews focused on the six functions of currency. To begin with, the results of the survey were as follows. Among the functions of currency, four (1.0%) respondents answered “agree” because of the exchange of currency, 137 (35.3%) respondents “slightly agree”, and 100 (25.8%) respondents “strongly agree”, explaining that more than about 61% of respondents agree on the use of Bitcoin due to its exchange. It showed that more than about 95% of respondents tended to agree on the use of Bitcoin because of the storage of currency, accounting for those, 181 (46.6%) respondents answered “slightly agree” and 189 (48.7%) respondents “strongly agree.” As to the value of currency, 24 (6.2%) respondents answered “agree”, 175 (45.1%) respondents “slightly agree”, and 173 (44.6%) respondents “strongly agree”,

implying that about 95% of respondents inclined to agree on the use of Bitcoin because of the value of currency. As regards the satisfaction of currency, 8 (2.1%) respondents answered “agree”, 156 (40.2%) respondents “slightly agree”, and 204 (52.6%) respondents “strongly agree”, explaining that about 94% of respondents tended to agree on the use of Bitcoin because of the satisfaction of currency. Concerning the convenience of currency, 6 (1.5%) respondents answered “agree”, 100 (25.8%) respondents “slightly agree”, and 241 (62.1%) respondents “strongly agree”, explaining that about 89% of respondents tended to agree on the use of Bitcoin because of the convenience of currency. Finally, as to the investment of currency, 149 (38.4%) respondents answered “slightly agree” and 239 (61.6%) respondents “strongly agree”, analyzing that all respondents tended to agree on the use of Bitcoin because of the investment of currency (Table 6).

Table 5. A paired *t*-test with before and after COVID-19.

Variable	Group	Average	SD	<i>t</i>	df	Sig.
Exchange	Before COVID-19	4.03	1.530	−1.304	76	0.196
	After COVID-19	4.40	1.907			
Saving	Before COVID-19	5.10	0.926	−3.338 **	76	0.001
	After COVID-19	5.73	1.392			
Value	Before COVID-19	5.90	0.528	−2.158 **	76	0.034
	After COVID-19	6.12	0.760			
Satisfaction	Before COVID-19	6.08	1.285	2.845 **	76	0.006
	After COVID-19	5.42	1.361			
Convenience	Before COVID-19	5.56	1.705	−0.757	76	0.451
	After COVID-19	5.77	1.413			
Investment	Before COVID-19	6.23	1.202	0.745	76	0.459
	After COVID-19	6.08	1.254			

** $p < 0.05$.

Table 6. Frequency analysis for why tourists employ Bitcoin.

Response	Exchange	%	Saving	%	Value	%	Satisfaction	%	Convenience	%	Investment	%
1												
2	33	8.5										
3	38	9.8					6	1.5	19	4.9		
4	76	19.6	18	4.6	16	4.1	14	3.6	22	5.7		
5	4	1.0			24	6.2	8	2.1	6	1.5		
6	137	35.3	181	46.6	175	45.1	156	40.2	100	25.8	149	38.4
7	100	25.8	189	48.7	173	44.6	204	52.6	241	62.1	239	61.6
Total	388	100.0	388	100.0	388	100.0	388	100.0	388	100.0	388	100.0

In addition to the quantitative statistical technique accompanying the questionnaire, semi-structured e-mail and telephone interviews were performed with 10 respondents to analyze the reason for and an in-depth understanding of the use of Bitcoin. Similar to the triangulation technique, there are various methods of data collection and analysis according to qualitative data to secure validity and reliability in qualitative research. In this study, however, both e-mail responses and recorded data from telephone interviews were utilized for analysis due to temporal and spatial constraints. Each of the 10 interviews by phone were conducted for about 30 min, and the interviews were recorded. The data obtained through e-mail and telephone interviews were analyzed using techniques such as template or thematic analysis. Words that appeared repeatedly more than two times in each e-mail and telephone interview were considered to be important key terms and listed as shown in Table 7. In e-mail interviews, saving, investment, currency, uncertainty, satisfaction, news, following what others do, Ethereum, and earnings rate were found as important terms, whereas, in phone interviews, satisfaction, future, long-term investment, following what others do, media, other virtual currencies, market, uncertainty, and stock were identified as key terms. In both the e-mail and phone interviews, investment, currency,

uncertainty, satisfaction, media, and following what others do were commonly found as key words.

Table 7. Key terms from the interviews.

Method	Terms Found from Interviews More than Two Times
e-mail	Saving, investment, currency, uncertainty, satisfaction, news, followed by others, Ethereum, earnings rate
Phone	Satisfaction, future, long-term investment, follow what others do, media, other virtual currencies, market, uncertainty, stock

Additionally, each of the 10 e-mail interviews and telephone interviews were conducted, and most of the responses from interviews were similar. The representative samples of e-mail and phone interviews answered a question of why you use Bitcoin as follows:

E-mail interview: “Like everyone else, I’m investing in Bitcoin, a virtual currency, because of the uncertainty about the value of money. Information and prices for Bitcoin are being checked through media. There seems to be no more reliable investment in future than Bitcoin”.

Phone interview: “I followed them because my friends and acquaintances are interested in and invest in Bitcoin. In fact, Bitcoin got much better earnings rate than stocks or other virtual currencies like Ethereum. There is no investment like Bitcoin in the current uncertain market. I’m also recommending investment in virtual currency around me”.

As presented in the e-mail and phone interviews, interviewees showed a common attitude that they use Bitcoin because of the investment of Bitcoin. These results run parallel with the counterparts of the frequency analysis that tourists use Bitcoin because of the current boom and investment in the currency. In addition, in both interviews, interviewees were observed to imitate investment in Bitcoin from their acquaintances and friends. This result should be paid attention to because it involves helpful implications academically, such as the imitation of an act, individualism and collectivism, and analyses of the causal relationship between the imitation of an act and the investment in currency.

4.5. Simple Regression Analysis

A simple regression analysis was used to analyze whether each of the six functions of Bitcoin as a currency had a meaningful impact on the sustainable intention to use it. As a result, it showed that the exchange, storage, and value of Bitcoin had no significant effects on intention to continue to use Bitcoin. The Hypothesis 5, therefore, that the exchange of Bitcoin will have a significantly positive effect on the intention to continue to use it, the Hypothesis 6 that the storage of Bitcoin will have a significantly positive effect on the intention to continue to use it, and the Hypothesis 7 that the value of Bitcoin will have a significantly positive effect on the intention to continue to use it were all rejected. Meanwhile, the satisfaction, convenience, and investment of Bitcoin were found to have significant effects on intention to constantly use Bitcoin at a 0.1% of significance level. Thus, the Hypothesis 8 that the satisfaction of Bitcoin will have a significantly positive effect on the intention to constantly use it, the Hypothesis 9 that the convenience of Bitcoin will have a significantly positive effect on the intention to constantly use it, and the Hypothesis 10 that the investment of Bitcoin will have a significantly positive effect on the intention to constantly use it were all accepted (Table 8).

Specifically, from the regression equation of the adopted Hypothesis 8, it accounts for the intention to constantly use Bitcoin increasing by 0.131 when the satisfaction of Bitcoin recognized by tourists increases by one unit. In addition, from another regression equation of the adopted Hypothesis 9, it interprets that when the convenience of Bitcoin recognized by tourists increases by one unit, the intention to constantly use Bitcoin increases by 0.102. Likewise, from the regression equation of the adopted Hypothesis 10, it explains that when the investment of Bitcoin recognized by tourists increases by one unit, the intention to constantly use Bitcoin increases by 0.148. As seen from each regression equation of

the adopted hypotheses, the regression coefficient from the regression equation with investment of Bitcoin was found to be the largest. This provides evidence that among several functions of currency, the investment of currency has the greatest influence on the intention to continue to use Bitcoin.

Table 8. The results from a simple regression analysis.

Independent Variable	Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	<i>p</i>
	β	SE	Beta		
Constant	6.421	0.095		67.512	0.000
Exchange	−0.017	0.020	−0.044	−0.859	0.391
Constant	6.252	0.148		42.286	0.000
Saving	0.017	0.026	0.033	0.649	0.517
Constant	6.405	0.266		24.108	0.000
Value	−0.010	0.044	−0.011	−0.226	0.821
Constant	5.595	0.159		35.215	0.000
Satisfaction	0.131	0.027	0.239	4.837 ***	0.000
Constant	5.756	0.148		38.797	0.000
Convenience	0.102	0.025	0.204	4.084 ***	0.000
Constant	5.429	0.190		28.585	0.000
Investment	0.148	0.030	0.242	4.902 ***	0.000

Note: Dependent variable: Sustainable intention to use Bitcoin. *** $p < 0.001$.

5. Conclusions and Discussion

5.1. Conclusions

The conclusions, based on the analytic results of this study, are as follows. First, the study analyzed whether there are differences of means in the recognition of the functions of cash among the three groups using different payment methods in a tourist destination, resulting in there being significant differences of means in the recognition of the functions of cash. In terms of the difference in recognition of the functions of cash, those tourists who mainly used cash were higher than those who mainly used both cards and Bitcoin. This implies that tourists in a tourism destination still prefer to pay with cash as a payment method over paying with cards or virtual currency and that they are more satisfied and find it convenient spending cash. This study, however, is limited to only the results from the perspective of tourists. Whether local residents of tourism destinations consider that cash is a reliable and easy means of exchange is required in future research. These implications of this research differ from previous research that has analyzed the functions and transition of traditional money in the economics sector, as addressed in the introduction, in that the functions of virtual currency recognized by tourists were identified [25,26].

Second, the study analyzed whether there are differences of means in recognition of the functions of cards and Bitcoin, resulting in there being differences of means in the recognition of the functions of cards and Bitcoin. In addition, this finding is significant because other research solely analyzed cryptocurrencies in given locations without comparisons of the functions of currencies [21,23]. In terms of the differences of means in the recognition of the functions of cards, in the group who mainly used cards, only the value and satisfaction of currency were higher than the two groups who mainly used cash and Bitcoin. Generally, when the reason for using a card in a tourist destination is asked, it anticipates that it is due to the exchange and convenience among the functions of currency, but the result is not as expected. From this result, in-depth and additional analyses are needed on why tourists use cards for other reasons in a tourist destination, except for the exchange and convenience of currency. In terms of the differences of means in recognition of the functions of Bitcoin, the group who mainly used Bitcoin was higher than the group who mainly used cash in the exchange, satisfaction, and investment of the currency. As reported as a controversial topic in the current media, the group who mainly used Bitcoin employs it in terms of the exchange and investment of currency. Currently, in many overseas destinations, Bitcoin is

already being used as a sustainable payment method. Since Bitcoin is not a currency that will disappear in a moment, it is necessary to form a tourism destination where Bitcoin can be sustainably considered a means of payment and exchange in Korea.

Third, the study analyzed whether there are differences of means in the functions of Bitcoin recognized by tourists before and after the outbreak of COVID-19, and as a result, the differences of means were shown in the storage, value, and satisfaction of Bitcoin. It indicates that from a clue that the storage and value of Bitcoin recognized by tourists after COVID-19 were higher than those of Bitcoin recognized by tourists before COVID-19, tourists rely more on virtual currency and prepare for the future with virtual currency when a factor that has an unstable impact on the social economy such as COVID-19 occurs. Additionally, in terms of the satisfaction of Bitcoin, from the result that the mean before COVID-19 was higher than the mean after COVID-19, it implies that it is because tourists could not freely take advantage of Bitcoin at a tourism destination and might feel inconvenienced. This result, however, is required to identify whether similar results show when other difficulties such as the economic crisis happen in addition to an unexpected pandemic such as COVID-19. These findings and implications are critical in that another study on the functions of Bitcoin recognized by tourists before and after COVID-19 is absent, even though there exists a bundle of individual research either in the usage of Bitcoin or in COVID-19 at a tourism destination [21,23,30,31].

Fourth, based on the functions of currency, why tourists employ Bitcoin was identified through frequency analysis and semi-structured in-depth interviews. In the frequency analysis, it was found that tourists placed a great importance on the storage, value, satisfaction, convenience, and investment of Bitcoin, and almost all tourists answered that they use it because of the investment of Bitcoin. This is the same in the results from interviews, implicating that tourists use Bitcoin for the purpose of investment rather than other functions of currency, particularly the function of exchange. Eventually, through both quantitative and qualitative approaches, this finding that the functions of currency are changing is important because Bitcoin becomes part of currencies regardless of Bitcoin being virtual. In addition, the results from interviews showed the imitation of behavior that tourists followed what others invest in Bitcoin. Tourism planners and providers will make full use of the behavioral imitation of tourists at a tourism destination.

Fifth, the study analyzed that satisfaction, convenience, and investment of Bitcoin have significantly positive effects on intention to continue to use it. This implies that tourists are interested in the satisfaction, convenience, and investment of Bitcoin rather than the exchange, storage, and value of it. In addition, economists and other professionals predict that although currencies such as cash and cards are used in tourist destinations, virtual currencies such as Bitcoin will continue to be used [56]. Again, the functions of currency recognized by tourists, particularly virtual currency, are changing, thereby preparing their needs. From the demographic information of this study, more than 80% of respondents were found to have high monthly incomes of USD 4000 or more. If tourism developers and policy makers aim to entice high-income tourists, they should pay attention to the satisfaction, convenience, and investment of currency and provide convenience to use virtual currency such as Bitcoin ATMs in tourist destinations [57]. This alternative will look forward to helping improve satisfaction of tourists as well as attracting high-income tourists.

5.2. Discussion

This study has several limitations such as the shortcomings of empirical studies. First, since this study was conducted in Korea, it is difficult to generalize the results from the research. In order to further assure the reliability for generalization of this study, many studies similar to the purpose of this study should be carried out not only in Korea but also overseas. If a series of comparable studies are conducted, the results of this study can be used as evidence for subsequent studies to determine whether the results of this study are limited to only Korea or applied to the whole world. In addition, this study has performed

the survey with solely those who have used the Bitcoin. For the generalization of results of similar studies, future surveys should contain their opinions of both Bitcoin users and non-Bitcoin users. Additionally, this study did not ask respondents a question of educational level in demographic characteristics. If the educational level is asked to respondents in future research, a comparable evaluation of functions of currency by respondents will be accounted for with demographic variables of occupation and monthly income. Second, this study, as in other studies, was conducted with only a virtual currency called Bitcoin among various virtual currencies [21,23]. There are various types of virtual currencies, such as Ethereum. In future studies, if a series of studies are conducted not only on Bitcoin but also on several virtual currencies, they will enable the comparison and characterization of different virtual currencies. Third, this study is a cross-sectional study based on a specific period of time. Longitudinal studies are needed to further secure the reliability and validity of this study. Decades have passed since the first advent of virtual currencies, but longitudinal studies on virtual currency are rarely found. Through longitudinal research on virtual currency, it is available to analyze the characteristics of each period and its user.

In spite of the above limitations, this study was of value as an empirical study by finding out whether the three functions of extant currency are applied equally to virtual currency. In addition, the practical and theoretical implications from the conclusions of this study are as follows. First, despite the tremendous popularity and interest in Bitcoin in Korea, as well as the expansion of the overseas market of virtual currency, the study helped follow-up studies on the relationships between tourists and virtual currency because of no research in those tourists who use Bitcoin. Second, since this study is the first research in virtual currency that is different from the existing topics of tourism economics, it presents political suggestions and implications for a few issues related to virtual currency at tourism destinations. This study enables a theoretical debate between not only researchers who study typical tourism phenomena but also economists who focus on the theory of currency. Third, by examining responses to using Bitcoin by tourists at home and overseas through an instrument employed in this study, the study provided a comparative study between Bitcoin and other currency users. Lastly, the following studies are not analyses from the perspective of tourists, but a role of tourism providers according to future commercialization of virtual currency will be a future assignment.

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