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Examining the effects of information sources on individual earning rates in the South Korean stock market

Eunil Park^a and Sang Jib Kwon^{b*}

^a*Graduate School of Innovation and Technology Management, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea;* ^b*Department of Business Administration, Dongguk University, Gyeongju, Republic of Korea*

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Since the introduction of the Korea Stock Exchange, individual investors have been some of the most important players in the stock market. With the subsequent introduction of the Internet and online trading systems in South Korea in 1997, the participation of individual investors in the Korean stock market has greatly expanded. However, few studies have investigated their activities and earning rates. To address this research shortcoming, this study investigates the antecedents of individual investors' earning rates in the Korea stock market by employing multiple constructs of information channels and perceived usefulness. Structural equation modelling (SEM) analysis of survey data collected from 1555 individual investors reveals that the information quality of online trading systems and of companies' public announcements largely determines the individual investors' perceptions of their usefulness, whereas the information quality of two Internet channels (Internet news and other web pages) only moderately affects perceived usefulness. Additionally, the information quality of two TV channels significantly affects perceived usefulness, but the effects are weaker than for the other channels. In addition, our findings confirm a close relationship between the perceived usefulness of information and individual investors' earning rates. Last, we discuss the implications and present suggestions for future research.

Keywords: individual investor; information channels; Internet; South Korea; stock market; usefulness

JEL classification: C00, D83, E22, F30, G02, G11.

1. Introduction

Since their introduction, online advanced stock trading systems have become the main channels for trading stocks. In particular, they have induced many individual investors to participate in stock markets (Kaniel, Saar, & Titman, 2008; Nagy & Obenberger, 1994). This increase in individual investors is considered one of the most important factors affecting the South Korea stock market. In 2013, individual investors' share trading exceeded 50% in the South Korea stock market (SBS, 2013). However, although many studies have investigated the effects of investment by governmental agencies and foreign investors on the South Korea stock market (Jones & Bublitz, 1990; Samuel, 1996; Song & Park, 1998), few have explored the impact made by individual investors.

Therefore, this study investigates two research questions:

*Corresponding author. Email: risktaker@dongguk.ac.kr

- A. Which information channel has led to the most successful financial activities of individual investors in the South Korean stock market?
- B. Which information channel is evaluated as most useful by individual investors?

Based on information obtained from direct observations and communications in society (e.g., the media), consumers including individual investors attempt to draw the overall map of the economic market. That is, individual investors recognise and understand the overall economic situation through general observations and communication by the media (Mutz, 1998). In particular, because it is not easy to understand the overall market and economic situation in terms of individual experience, the individual's overall assessment of the economic situation generally depends on the media (MacKuen, Erikson, & Stimson, 1992).

One of the most representative examples is seen by Blood and Phillips (1997). They indicated that delivering economic news and information through television channels brings long-term economic contraction effects because such information has the potential to affect individuals' thinking and financial decisions. Even though the South Korean stock market is considered one of the most dynamic markets in the world (Masih & Masih, 1997), individual investors' evaluations of particular information channels for their credibility have not been investigated. Therefore, research is needed to explore the effects of information channels' quality on individual investors' financial activities and economic opinions.

The remainder of this paper is organised as follows. We first review the literature and hypotheses regarding information channels and their quality for the South Korea stock market. Then, we describe the study's research methodology, followed by the statistical results. Finally, we present the discussion and conclusions based on the results and examine the study limitations.

2. Literature review and hypotheses

2.1. Information channels and their quality

Principal communication studies have regarded an information source as the beginning of sharing information (Shannon & Weaver, 1949). However, few studies have investigated the characteristics of information sources. Integrating the concept of a source into the field of information, it can be defined as 'the point from which information is obtained' (*Oxford Dictionary*, 2013). From a media-centric viewpoint, an information source is defined as 'a person, book, or magazine, etc., providing information.' Information receivers do not clearly distinguish sources between those who create and generate information and those who deliver information (Chaffee, 1986; Sundar, 2000). This tendency has also been found in several studies investigating the relationship between information sources that are media channels and their effects on society (Carter & Greenberg, 1965).

The credibility of the information source is important to consider. Due to the numerous information sources, such as groups, persons, and organisations (Brians & Wattenberg, 1996; Chen & Gursoy, 2000; Flanagan & Mertzger, 2000), credibility perceived by the receivers of particular information can differ depending on both the sources that generate and disseminate the information and the channels that deliver the information (Nolan, 1976; Wathen & Burkell, 2002).

With the introduction of new broadcasting and communication technologies, numerous information sources and channels compete to become the top contender (Flanagin & Mertzger, 2000). Among these sources, the Internet as a source of information is quite different from traditional information sources with its unique characteristics such as interactive and real-time information (Jang & Kwon, 2009).

From a cognitive viewpoint, the information receiver using information technologies such as the Internet and television knows the information source and channel because of the interactivity of the technologies. For instance, Reeves and Nass (1996) reported that users tend to react socially to the Internet, computers, and artificial agents. Based on the computer as social actor paradigm, there is a clear tendency for people to consider computers as social agents if the computers can generate and deliver information that addresses their intentions and motivations.

Today, information receivers can choose their preferred information contents and channels. As presented by Sundar (2000), information is delivered in the following steps: Information Presenter → Channel → Receiver. For information transmission in the current age, an information presenter's content can be delivered via multiple different information channels. For example, newsreaders can deliver news via television while the same news is presented on websites. Therefore, to explore the effects of financial information on individuals' investments in the stock market and their results, it is appropriate to investigate the effects of the information channels, rather than the sources generating the information.

Information has become one of the most important factors in every activity. Prior studies have indicated that having more financial information significantly improves performance (Simon, 1989). Dybvig and Ross (1985) found that differential information can lead to differential performance in a market. They investigated this relationship by using a security market line. Behn and Reley (1999) also reported that having much more useful information in a market enhanced the financial performance. In a study in South Korea, Park (2009) similarly found that sharing useful financial information can improve financial analysts' and investors' performance. Therefore, based on the findings of previous studies, this study hypothesises that:

Hypothesis 1. Perceived usefulness of information significantly affects individuals' investment earning rates.

2.2. South Korea stock market and media

2.2.1. Internet and stock market in South Korea

Individual investors can use a vast array of websites and software in trading their stocks and assets and sharing information. In particular, the Home Trading System (HTS) allows investors to obtain stock information and trade the stocks. From the late-1980s to the mid-1990s, home investment information systems were provided for inquiring about stocks. In South Korea, a version of HTS able to trade stocks was introduced in April 1997. It was superior to traditional trading services because its fees were low, it enabled checking of stock prices, and it provided real-time information as well as counselling via the Internet. Subsequently, the shares traded in online systems have greatly increased.

In April 1997, South Korean securities firms provided HTS or KOSTEL (an online stock service served by a PC communication system), which led to stock trading systems and services via the Internet. The initial version of this service was used to

investigate the history and balances of stock prices. Later, the scope of the service was expanded to provide corporate disclosure views and the ability to buy and sell securities. With the rapidly expanding services, the total size of the online trading of stocks in the South Korean stock market increased over 12-fold from mid-1997 to mid-1998. The amount of commitment money in Internet securities also increased over seven-fold from 450 billion-KRW in January 1998 to 3500 billion-KRW in July 1998.

In 2009, about 50% of the total stock trading in South Korea was processed in online services (Shin, Jo, & Kim, 2012). The rapidly increased online stock trading in HTS resulted from the convenience of easy trading and relatively easy information acquisition. This ease of information acquisition means that the investors regard information from the Internet as a useful element in their decisions (Lee, Park, & Shin, 2010).

Several studies have focused on the relationship between online information and individuals' perceptions. Flanagin and Mertzger (2000) reported that individuals tend to use the Internet more heavily for gathering information than other traditional media sources, such as magazine, television, or face-to-face interactions. Thus, seeking information is one of the biggest motivations for using the Internet. This trend also affects individual investors in the stock market. They can achieve more diverse and real-time information via the Internet than traditional media (e.g., TV and radio; Yoon & Kim, 2001).

However, the Internet can differ from other media technologies employed for information sharing, with significant effects on credibility and usefulness of information. Because the Internet has several unique characteristics (e.g. interactive and real-time), it is worthwhile investigating the effects of using the Internet as a financial information channel on individual perceptions of the stock market (Barber & Odean, 2001; Tumarkin & Whitelaw, 2001). In this study, we categorise websites into two subjective groups: Internet news and other websites (e.g. community websites), because the Internet news service is considered one of the top destinations of Internet users. Based on this categorisation, this study hypothesises that:

Hypothesis 2. The information quality of Internet-news significantly affects its perceived usefulness.

Hypothesis 3. The information quality of other web pages significantly affects their perceived usefulness.

2.2.2. *Television and the stock market in South Korea*

Since the 1990s, responding to heightened interest in financial issues, several attempts were made in South Korea to produce professional TV channels that mainly explore economic, financial, and global issues. As a result, Maeil Business News (MBN) was established as the first professional economic TV channel in 1993 (MBN, 2013). Collaborating with Consumer News and Business Channel (CNBC), it was named MBN CNBC in 2005 and grew into the principal broadcasting channel in South Korea. Now, it provides several media channels including DMB (MBN-DMB), radio (MBN-radio), and the Internet. In 2010, because MBN was selected as a provider of comprehensive programme TV channels in South Korea, it provided a large amount of new content and programmes, although it maintained its focus on economic and financial issues and the South Korean stock market (Segye.com, 2011).

Another principal TV channel is SBS CNBC. With a slogan of being the 'premium economics channel in South Korea', it attempts to fill the need for public economic

information from a global perspective. Since its establishment in 2009, it has provided a great deal of high-quality economic content and programmes in South Korea. In South Korea, these are the most popular TV channels. For example, MBN records the highest viewing rate among the South Korean comprehensive programme TV channels (Lee, 2013).

Several studies have found significant connections between information channels and users' perceptions (Stevenson, Gonzenbach, & David, 1994). Blood and Phillips (1997) demonstrated a close relationship between financial TV news and consumers' psychological states. In addition, Hester and Gibson (2003) found that the tone and properties of TV news significantly affect consumers' subjective economic awareness. In addition to TV news, several professional financial TV channels are provided in South Korea that deliver more detailed financial information than the traditional TV news. Considering that individuals attempt to understand the overall economic environment and global market by listening to the opinion of experts represented in the mass media or newspapers (MacKuen et al., 1992), the professional financial TV channels should significantly affect individual investors' perceptions (Fehle, Tsyplakov, & Zdorovtsov, 2005; Takeda & Yamazaki, 2006).

In South Korea, Lee, Shim, and Park (2007) found that negative economic TV news makes individual investors form pessimistic economic forecasts. However, no study has focused on the effects of professional-trading TV channels on the psychological states of individual investors. Therefore, based on the findings of previous studies, the current study hypothesises the following.

Hypothesis 4. The information quality of professional-trading TV channels significantly affects its perceived usefulness.

Hypothesis 5. The information quality of TV news significantly affects its perceived usefulness.

2.2.3. *Other Information channels and the stock market in South Korea*

As mentioned in Section 2.2.1, HTS is commonly used in homes and offices. However, principal stockbrokers and brokerage firms have used electronic stock trading systems since the 1980s. Commercially, NAICO-NET was introduced in the US market as the first system that allowed users to trade their stocks via computer networks. However, because this machine was too expensive for general use, only about 5000 users, mainly brokerages and brokers, bought it (Exactrades, 2012).

Now, with the rapid diffusion of personal computers in the 1990s, users have the resources to communicate and explore the Internet, and the cost of online stock trading has declined. With this trend, many online stock trading services have been offered to and used by individual investors. In addition, since the 2000s, several notable attempts have been made to develop mobile stock trading systems. By using wireless networks such as the 3G or LTE employed by mobile devices, users can access stock trading systems via their mobile devices. Securities companies now have their own mobile applications and computer software developed for participating in the stock trading market.

Through unique applications and software, companies provide a lot of information that can help users make their decisions. Table 1 shows a widely used functional example in South Korea. These applications and software allow users to get useful information and do many financial activities. Therefore, information from these applications and software also affects the psychological states of individual's investors. Therefore, this study hypothesises that:

Table 1. An example of an online trading systems in South Korea.

Types	Level	Description
Advanced	Professional	<p>Dedicated system for professional investors based on their dealing patterns in stocks</p> <ul style="list-style-type: none"> - Multi-display: possible to simultaneously monitor multiple virtual screens - Save user-screen: possible to freely create users' own working screen based on their-own dealing style - Save buy & sell setting: strengthening buy & sell functions for quick orders in the market - New stock trading techniques: providing various functional techniques for buy & sell activities
	Global	<p>Integrated system for foreign and domestic trading activities including domestic futures/options, foreign futures/options, FX margin, and other derivative trading activities</p> <ul style="list-style-type: none"> - Provide global integrated system: possible to invest all domestic derivative trading and foreign trading activities - Powerful chart and order features: possible to simultaneously see comprehensive charts and trade stocks on the screen. - High-quality screen display for various orders: providing various types of total orders displayed on screen - Power user-friendly features: providing multi-display function, sharing stock information, and three systematic interfaces for responding to user-preferences
Basic	Useful	<p>Comprehensive trading system for general investors who want to do easy and comfortable buy & sell activities</p> <ul style="list-style-type: none"> - Powerful search functions: providing powerful item exploring functions of real-time and various patterns search - Comprehensive order functions: providing processed steps of buy & sell activities including capturing stock quotations, verifying quotations, placing orders, and confirming orders - Useful detailed chart-display functions: providing various charts that can analyse various stocks at the same time
	Easy	<p>Easy trading system with simple and clear screen configuration for customers who first start their stock trading activities</p> <ul style="list-style-type: none"> - Selecting display types based on user's competence: providing various display interfaces based on user's proficiency of using the system - Providing convenient screen-selecting functions: providing simple menu configurations - Notifying a summary of market information: providing notification service including major market changes via dialogue box
Mini	Mini	<p>Light and simple system with small programme screen and essential functions (e.g., inquiring about market price)</p> <ul style="list-style-type: none"> - Equipping diverse display functions: providing shading, and transparent and hidden displaying features - Ease of inquiries for price quotation feature for users of multi tasks - Strong stock capture features with diverse forms of main screen for usability

Source: Authors.

Hypothesis 6. The information quality of trading systems significantly affects their perceived usefulness.

In addition to the previously mentioned information channels, the majority of companies are obligated to announce their annual states, including financial and strategic states, and other significant changes in a process called corporate disclosure. In this study, we regard corporate disclosure as the companies' public announcements that include all kinds of information announced by companies. Previous studies have indicated that public announcements by companies strongly affect shareholders' earning rates (Shim, 1996), the size of individual investments (Jang & Kwon, 2009), and shareholders' individual evaluations of the companies (Jang & Cheon, 2003). In South Korea and China, several studies have indicated that announcements of companies' equity offerings significantly affect the companies' stock prices and shareholders' buying and selling activities (Kim & Kong, 2000; Shin, 1995; Woo, Park, & Kim, 2010). Therefore, taking into account the findings of prior research, this study hypothesises that:

Hypothesis 7. The information quality of companies' public announcements significantly affects their perceived usefulness.

2.3. The proposed research model

The research model based on the study hypotheses is presented in Figure 1.

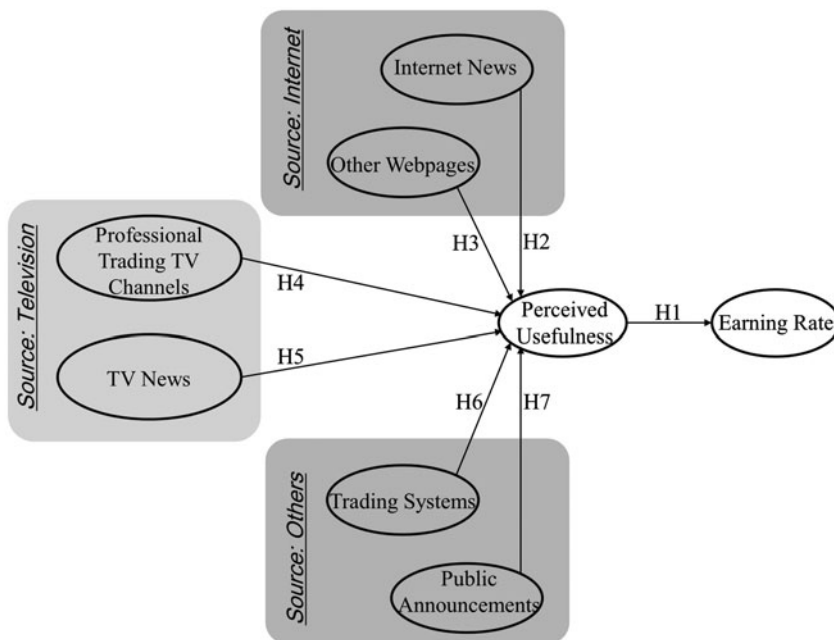


Figure 1. The research model; Internet news=Information quality of internet news, Other webpages=Information quality of other webpages, Professional trading TV channels=Information quality of professional trading TV channel, TV News=Information quality of TV news, Trading systems=Information quality of trading systems, Public announcements=Information quality of public announcements.

Source: Authors.

3. Study design

3.1. Questionnaire design

The survey was developed to verify potential factors of the cognitive and psychological characteristics of individual investors with respect to their obtaining financial information. The procedures and detailed processes were validated in previous studies (Shin & Shin, 2011).

We first used a pre-test to explore the validity of 28 items we initially chose from previous research (Davis, 1989; Pai & Huang, 2011; Park, Kim, Jin & del Pobil, 2012; Shyu & Huang, 2011). All collected questionnaire items were carefully translated from English to Korean by two professional translators. After the translation, the questionnaire items were carefully back-translated to English by three researchers in order to confirm that the translated questionnaire items correctly reflected what the initial items intend to measure.

The chosen items were reviewed and revised by a panel organised by nine professors in the fields of finance, communications, and information science. Then, we conducted three rounds of pre-surveys with 36 graduate students with prior experience in investing in stock markets. Respondents were asked to tell the experimenters if they did not fully understand the presented items. The reliability of the questionnaire items was measured by calculating Cronbach's alpha, which resulted in the exclusion of seven items. The remaining 21 items, shown in Table 2, were included in the main survey.

3.2. Main survey

The main survey was conducted by a professional survey company via the Internet. All questionnaire items employed a 7-point Likert scale (from 1='strongly disagree' to 7='strongly agree'). We collected 1712 completed surveys. After screening, 1555 valid survey responses were included in the study analyses. The respondents' demographic information is shown in Table 3.

4. Results

4.1. Descriptive analysis

Descriptive statistics of the constructs are presented in Table 4. All mean values were greater than 4.0, which indicates that the respondents had positive attitudes toward information channels and related activities.

4.2. Analysis methods

We used structural equation modelling (SEM) with confirmatory factor analysis (CFA) to investigate the hypothesised relationships. For good reliability, all Cronbach's alphas, composite reliability, and factor loadings should be higher than 0.7, while average variance extracted should be greater than 0.5 (Anderson & Gerbing, 1988; Hair, Black, Babin, & Anderson, 2006). We evaluated the reliability and validity of the constructs in the research model using LISREL 8.70. It has been recommended that more than 200 samples should be used for accurate SEM results (Anderson & Gerbing, 1988; Fornell & Larcker, 1981; Holbert & Stephenson, 2002); the current study satisfied this requirement (Table 5).

Table 2. Questionnaire items used in the main survey.

Constructs	Items	Descriptions
Perceived usefulness	PU1	I think activities via information channels are useful to my financial performance
	PU2	Getting information through media channels increases my financial performance
	PU3	Getting information through specific media channels fully meets my needs
Information quality of internet news	IQI1	Getting information via financial news on the Internet provides perfect and precise services in line with my purposes
	IQI2	Information provided by Internet news is easy to understand
	IQI3	Internet news provides accurate and reliable information
Information quality of other web pages	IQO1	Getting information from other web pages (without Internet news) provides perfect and precise services in line with my purposes
	IQO2	Information provided by other web pages (without Internet news) is easy to understand
	IQO3	Other web pages (without Internet news) provide accurate information and reliable
Information quality of professional trading TV channels	IQP1	Getting information via professional-trading TV channels provides perfect and precise services in line with my purposes
	IQP2	Information provided by professional-trading TV channels is easy to understand.
	IQP3	Professional-trading TV channels provide accurate and reliable information
Information quality of TV news	IQT1	Getting information via TV news provides perfect and precise services in line with my purposes

(Continued)

Table 2. (Continued).

Constructs	Items	Descriptions
Information quality of trading systems	IQT2	Information provided by TV news is easy to understand
	IQT3	TV news provides accurate and reliable information
	IQS1	Getting information via trading systems provides perfect and precise services in line with my purposes
	IQS2	Information provided by trading systems is easy to understand
	IQS3	Trading systems provide accurate and reliable information
	IQA1	Getting information via companies' public announcements provides perfect and precise services in line with my purposes
Information quality of public announcements	IQA2	Information provided by companies' public announcements is easy to understand
	IQA3	Companies' public announcements provide accurate and reliable information
	Q: What is your earning rate on investments in the South Korean stock market?	
Earning rate	1: lower than -14%	4: 0-7%
	2: -14- -7%	5: 7-14%
	3: -7-0%	6: 14-21%
		7: higher than 21%

Source: Authors' calculation.

Table 3. Respondents' demographic information and investment experience in the main survey ($N=1555$).

Age	<i>N</i> (%)	Investment experience	<i>N</i> (%)
22–30	229 (14.7%)	2–5 years	319 (20.5%)
31–40	491 (31.6%)	5–10 years	818 (52.6%)
41–50	339 (21.8%)	10–15 years	191 (12.3%)
51–60	297 (19.1%)	15–20 years	142 (9.1%)
Over 60	199 (12.8%)	Over 20 years	85 (5.5%)
Education		The amount of investment in South Korea stock market	
High school	298 (19.2%)	Lower than 5 million-KRW	412 (26.5%)
College	811 (52.2%)	5–10 million-KRW	594 (38.2%)
Graduate or above	446 (28.7%)	10–50 million-KRW	337 (21.7%)
Gender		50–100 million-KRW	172 (11.1%)
Male	984 (63.3%)	Higher than 100 million-KRW	40 (2.6%)
Female	571 (36.7%)		

Source: Authors' calculation.

Table 4. Descriptive statistics of the constructs.

Construct	Mean	Standard deviation
Perceived usefulness	5.02	1.00
Information quality of internet news	5.01	0.97
Information quality of other web pages	5.13	0.99
Information quality of professional trading TV channels	4.77	1.10
Information quality of TV news	4.79	1.04
Information quality of trading systems	5.11	0.95
Information quality of public announcements	5.22	0.96

Source: Authors' calculation.

Previous studies also identified that the square root of the average variance extracted of each construct must be greater than the correlation between two constructs. As presented in Table 6, the current study met this recommendation.

4.3. Reliability and validity of measurements

The fit indices of the measurement model were generally good except for the ratio: $\chi^2/\text{d.f.}$ (Table 7).

4.4. Hypothesis testing

The hypothesised relationships were investigated to express the structural connections. Similar to the fit indices of the measurement model, the fit indices of the research model indicated a generally acceptable goodness of fit, except for the ratio: $\chi^2/\text{d.f.}$ (Table 7). The results of the SEM supported all hypotheses in the research model.

As summarised in Figure 2 and Table 8, the analysis results supported all hypotheses. Perceived usefulness was determined by six constructs, two strong factors, two moderate factors, and two weak factors. Information quality of trading systems (H_6 , standardised coefficient=0.643, $CR=54.866$, $p<0.001$) and information quality of

Table 5. Summary of convergent validity and internal reliability.

Construct	Items	Internal reliability		Convergent validity		
		Cronbach's alpha	Item-total correlation	Factor loading	Composite reliability	Average variance extracted
Perceived usefulness	PU1	0.889	0.847	0.779	0.856	0.665
	PU2		0.811	0.814		
	PU3		0.891	0.851		
Information quality of internet news	IQI1	0.871	0.891	0.855	0.886	0.721
	IQI2		0.822	0.817		
	IQI3		0.851	0.874		
Information quality of other web pages	IQO1	0.901	0.884	0.842	0.881	0.712
	IQO2		0.903	0.871		
	IQO3		0.798	0.818		
Information quality of professional trading TV channels	IQP1	0.904	0.851	0.812	0.894	0.739
	IQP2		0.888	0.899		
	IQP3		0.878	0.865		
Information quality of TV news	IQT1	0.811	0.747	0.797	0.860	0.672
	IQT2		0.795	0.810		
	IQT3		0.823	0.851		
Information quality of trading systems	IQS1	0.856	0.792	0.818	0.897	0.745
	IQS2		0.912	0.899		
	IQS3		0.894	0.870		
Information quality of public announcements	IQA1	0.922	0.895	0.880	0.897	0.744
	IQA2		0.899	0.912		
	IQA3		0.854	0.791		

Source: Authors' calculation.

Table 6. Summary of discriminant tests; diagonal elements (bold) are the square root of average variance extracted (AVE) between the constructs and their measures.

	1	2	3	4	5	6	7
1. Perceived usefulness	0.815						
2. Information quality of internet news	0.191	0.849					
3. Information quality of other web pages	0.444	0.412	0.844				
4. Information quality of professional trading TV channels	0.198	0.501	0.309	0.859			
5. Information quality of TV news	0.318	0.398	0.410	0.291	0.820		
6. Information quality of trading systems	0.337	0.391	0.019	0.318	0.451	0.863	
7. Information quality of public announcements	0.212	0.297	0.221	0.399	0.127	0.244	0.863

Source: Authors' calculation.

companies' public announcements (H7, standardised coefficient=0.545, CR=46.467, $p<0.001$) had strong effects on perceived usefulness, while information quality of Internet news (H2, standardised coefficient=0.191, CR=16.294, $p<0.001$) and information quality of other web pages (H3, standardised coefficient=0.178, CR=15.137, $p<0.001$) moderately affected perceived usefulness. In addition, the effects of information quality of professional-trading TV channels (H4, standardised coefficient=0.038, CR=3.216, $p<0.01$) and information quality of TV news (H5, standardised coefficient=0.077, CR=6.598, $p<0.001$) on perceived usefulness were weak. Individual investors' earning

Table 7. The fit indices.

Fit indices	The measurement model	The research model	Recommended level
$\chi^2/\text{d.f.}$	5.92	6.01	< 3.0
Incremental fit index (IFI)	0.911	0.921	> 0.9
Normed fit index (NFI)	0.909	0.929	> 0.9
Non-normed fit index (NNFI)	0.944	0.933	> 0.9
Comparative fit index (CFI)	0.922	0.917	> 0.9
Goodness-of-fit index (GFI)	0.931	0.901	> 0.9
Adjusted goodness-of-fit index (AGFI)	0.903	0.912	> 0.9
Standardised root mean square residual (SRMR)	0.048	0.049	< 0.05
Root mean square error of approximation (RMSEA)	0.044	0.049	< 0.05

Source: Authors' calculation.

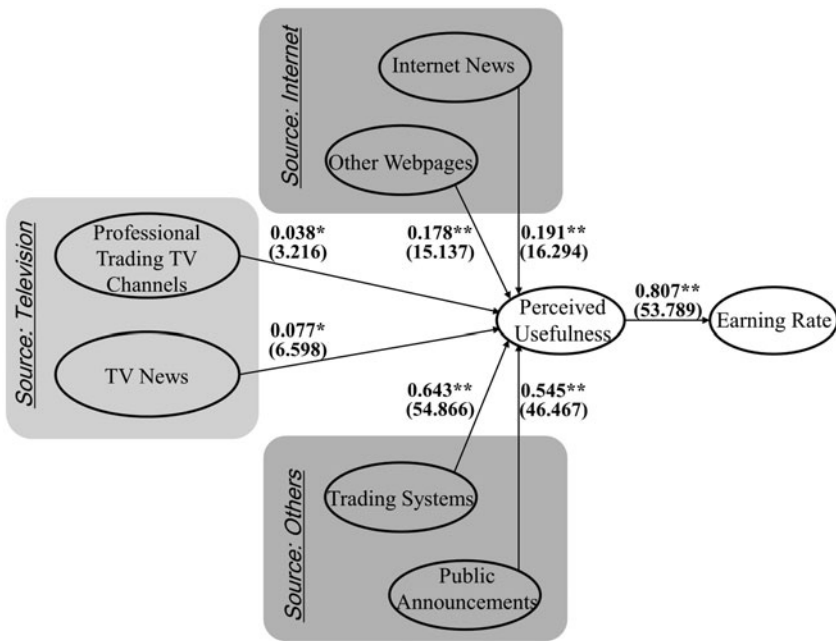


Figure 2. Results of the proposed research model; ** $p < 0.001$, * $p < 0.01$.
Source: Authors' calculation.

rate was determined by perceived usefulness (H1, standardised coefficient=0.807, CR=53.789, $p < 0.001$).

The research model indicated that 65.1% of the variance in the earning rate was explained by perceived usefulness, while 78.6% of the variance in the perceived usefulness was elucidated by the combination of information quality of Internet news, other web pages, professional-trading TV channels, TV news, trading systems, and companies' public announcements.

Table 8. Summary of hypotheses tests; ** $p < 0.001$, * $p < 0.01$; PU=Perceived usefulness, ER=Earning Rate.

Hypotheses	Standardised coefficient	SE	CR	Results
H1. PU \rightarrow ER	0.807**	0.015	53.789	Supported
H2. Internet news \rightarrow PU	0.191**	0.012	16.294	Supported
H3. Other web pages \rightarrow PU	0.178**	0.011	15.137	Supported
H4. Professional trading TV channels \rightarrow PU	0.038*	0.014	3.216	Supported
H5. TV news \rightarrow PU	0.077**	0.013	6.598	Supported
H6. Trading systems \rightarrow PU	0.643**	0.017	54.866	Supported
H7. Public announcements \rightarrow PU	0.545**	0.015	46.467	Supported

Source: Authors' calculation.

4.5. Supplemental analyses

In addition, this study conducted further SEM analyses on the respondents' gender, age level, education level, and the amount of investment in order to investigate whether they showed a particular pattern in the perception of individual investors toward information. The additional analyses revealed an absence of any such differential pattern.

5. Conclusion

This study contributes to the academic and theoretical framework to elucidate individual investors' information processing steps from principal information channels and examines earning rates by proposing a research model based on previous study findings and using SEM analysis to investigate the model.

Consistent with prior research that investigated information channels and stock markets, the results of the current study support our proposed research model. In addition, the results from the current study contribute to our understanding of individual investors' earning rates and their perceptions toward information channels. Our findings also provide valuable implications for understanding individual investors and their information gathering activities.

The computed fit indices of the data with the proposed model and the significant coefficients of the hypothesised connections support the reliability and validity of the suggested research model. Thus, the suggested research model is useful in explaining individual investors' earning rates in the South Korean stock market via their perceptions of the usefulness of gathered information from three core information channels.

Although all proposed hypotheses were confirmed, there were notable differences among the information channels. At the time of the survey, because the majority of stock trading activities are processed by online trading systems, the effect of the information quality of the trading systems on individual investors' perceptions of its usefulness (H6, standardised coefficient=0.643) was stronger than the effects of the other information channels. Companies' public announcements also significantly affected perceived usefulness, because this information is validated by the companies (H7, standardised coefficient=0.545).

In addition, the two information channels via the Internet moderately affected perceived usefulness (H2, standardised coefficient=0.191; H3, standardised coefficient=0.178), which is not surprising because the rapidly distributed Internet is an essential tool of people's lives. However, two traditional information channels,

i.e. professional-trading TV channels and TV news, only slightly affected perceived usefulness. Two reasons are postulated to explain this finding. First, as shown in the principal previous studies in this area, interactive media engenders in users more positive attitudes and perceptions of information (e.g. advertisements) than the same information presented via one-way media (Yu, 2011). Therefore, because the two TV channels are passive media, users may evaluate them as less important information channels. Second, in several cases, governments and governmental agencies have used various media channels as tools to communicate with participants of stock markets. For example, it has been largely debated that the Korean government and its agencies should not be involved in the stock market: neither directly (market intervention) nor indirectly (using media; Kwak, 2012; Ministry of Strategy and Finance, & KDI School of Public Policy and Management, 2013).

The study results present several academic and practical implications for researchers. From an academic viewpoint, the current study increases our understanding of the different effects of various information channels, and it demonstrates a relationship between individual investors' perceptions of the information's usefulness and their earning rates. Specifically, the current study identifies individual investors' information processing steps as they seek to improve their earning rates in the South Korea stock market. In addition, this study finds that greater interactivity of an information channel influences individual investors to perceive a higher information quality of the channel.

From a practical perspective, developers and workers for TV channels should devise ways to improve individual investors' perceptions of their information quality. For example, building a more interactive environment that allows users to share their opinions can improve the users' perceptions of its quality.

The study suffered several limitations. First, the results may not be accurately generalisable to all individual investors in South Korea because our sample was relatively small. Second, we did not examine all possible information channels from which individual investors may take information. Third, this study was conducted in South Korea, and the investment environment differs from that in other nations (Park & del Pobil, 2013). Fourth, our respondents were motivated to complete the survey and hence may have been different from those who did not respond. Therefore, future researchers should aim to address these limitations in further studies.

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