ATLANTIS PRESS
Advances in Economics, Business and Management Research (AEBMR), volume 37
International Conference on Transformations and Innovations in Management (ICTIM-17)

REVIEW OF THE IMPACT OF INVESTOR SENTIMENTAL ANALYSIS ON STOCK PRICE

Liang Dong
Shanghai Jiao Tong University, P.R. China

Ming Li
Jiangsu University of Science and Technology, P.R. China

Abstract

The development of behavioral finance makes the relationship between investor sentiment and stock market becoming the research center of academic circles. On the basis of some literatures, it is important to explain the relationship between investor sentiment and stock returns, which is important to the study of behavioral finance significance. This paper briefly introduces the development background of behavioral finance, and then focuses on the definition of investor sentiment, the construction of emotional index and the influence of emotion on stock returns, and puts forward to the direction of the future development according to the present research results.

Keywords: behavioral finance; investor sentiment; stock returns.

JEL code: F832

1. Introduction

Before the 1980s, the academic research on the financial field was based on the theory of efficient markets hypothesis. In short, it was assumed that the investors were rational. With the passage of time, the financial market continued to develop, and the scholars in the empirical research discovered that of financial markets there are many traditional financial theories which cannot explain the strange phenomenon in the efficient markets. With the challenges of hypothesis theory, it promotes the rapid development of behavioral finance theory.

The behavioral finance theory is based on the irrational assumption of the investor. It is devoted to the study of the psychological characteristics of the investors in the decision-making process and the market effect bringing about by it. It regards the investment behavior as a psychological process in the basic price, and the psychological and behavioral characteristics of the investors will also have an important impact on the price of the stock, which is more in line with the characteristics of the real financial market. Dele, Shleifer, Summers and Waldman

(DSSW) for the first time to introduce investor sentiment into the determination of stock prices, pointing out that if the investor sentiment interact with each other, the arbitrageurs are likely to make unreasonable pricing of the stock, and the investor sentiment will become a financial asset Systematic risk factors for equilibrium prices. After that, many scholars at home and abroad began to study the investor sentiment, which can be divided into the study of the overall effect of the stock returns on the stock returns and the cross-sectional effect about the stock returns. On the overall effect of investor sentiment research, in the foreign countries, there are Brown and Cliff (2004), Lee (1991), Baker and Wurgler (2006), etc abroad. In domestic country, there are Qiang Zhang and Shue Yang (2007), Meijin Wang and Jianjun Sun (2004), Shida Huang and Zhen Wang (2015), Kun Cheng and Renhe Liu (2005),etc. They have studied the relationship between investor sentiment and stock returns, and the conclusion also shows that investor sentiment can significantly affect stock returns. For the study of cross-sectional effects, representative studies in this area include Lee, Shleifer and Thaler (1991), Yumei Jiang and Mingzhao Wang (2010), Jiangchuan Lu and Jun Chen (2012), Lixu Chi and Xintian Zhuang (2011), Jing Lu and Yuan Zhou (2015), the results show that there are cross-sectional differences in the impact of investor sentiment on different types of stocks.

On the basis of reviewing the existing research results at home and abroad, this paper summarizes the basic connotation of investor sentiment, the construction of investor sentiment index and the influence of investor sentiment on stock market, and provides reference for the further study of investor sentiment theory and empirical aspects.

2. The Basic Connotation of Investor Sentiment

As an interdisciplinary subject of finance and psychology, investor sentiment has not yet formed a unified definition. With the deepening of research, the understanding of investor sentiment is endless. Foreign scholars give the definition of this, Lee, Shleifer and Thaler (1991) that the investor sentiment is based on the feelings of investors to make a decision, and this decision from the investor psychological or cognitive on the deviation from prospective yields. Stein (2003) defines investor sentiment as "erroneous" pricing of investors by assets, as well as investor speculative tendencies. Wurgler, Baker (2006) argued that investor sentiment is a subjective prediction of investors that is expected to be due to their inaccurate estimates of future cash flows and deviations from risks. In the domestic study, Meixian Wang, Jianjun Sun (2004) argue that the investor sentiment is the rational investors and noise traders on the risk of equity price deviation. Chunpeng Yang (2011) argues that investor sentiment is an important factor in reflecting investor psychology, which is a reflection of investors' willingness to invest or expected market sentiment, which has a great impact on the operation and development of securities market. Lu Yang (2015) that the investor sentiment is due to investors on the future cash flow or investment risk of the biased estimates, and then the inaccurate pricing on the assets, it cannot reasonably reflect the economic fundamentals of information.

The boundaries of investor sentiment are very vague, in fact, different research background, the specific meaning of investor sentiment may also be different, with the development of the study, its definition will continue to improve and develop. After synthesizing the mainstream definition of investor sentiment, the author gives the following definition: investor sentiment refers to the investor based on the expected future cash flow and investment risk of the formation of a belief, is the investor systematic bias of future predictions. Investor sentiment is an uncertain factor, is a reflection of investor psychological bias, it largely affects the investor's future judgments on future earnings, thus affecting the stock returns and investment behavior.

3. The Construction of Investor Sentiment Index

Due to the different understanding of the basic connotation of investor sentiment, domestic and foreign scholars in the choice of investor sentiment indicators are also different. According to the nature and acquisition of investors, the index of investor sentiment can be divided into: investor sentiment subjective index, objective index and investor sentiment comprehensive index.

3.1 Subjective Index

Subjective indicators are the way investors conduct a questionnaire survey to obtain investors' expectations for future market conditions, and then reflect the investor's view of the future trend of the stock market. Foreigners include: Brown and Cliff (2004) use the investor intelligence index as a set of emotional index, Fisher and Statman (2003) use the American Investor Association Index to forecast the future earnings of the S&P500 and find that this index is a reverse target. Domestic scholars also use similar indicators for empirical research, the formation of a more consistent indicator in China stock market, the examples are as follows: Meijin Wang, Jianjun Sun (2004) construct investor sentiment indicator by means of "CCTV system" program and point that investor sentiment is a systemic factor to affect the benefits. Qinyun Lai (2012) uses the "Good talking index" as a direct proxy variable for investor sentiment, using empirical analysis, and finds that the expected stock market gains were influenced by the investor's medium-term emotional index, and expects that stock market gains will have a positive change with the change of investor emotional index in the medium-term.

By measuring the subjective proxy variables of investor sentiments, and constructing the emotional index can visually reflect the investor sentiment. In the investment decision-making, although the emotion can affect investment behavior, not to say that all investors in the investment will be affected by the emotion. If sometimes investors do not act in full compliance with their emotions, they seem to be more sensible in their actual investment behavior than their emotions. Therefore, the question of validity and sample selection is to be further studied.

3.2 Objective Index

Objective indicators refer to the collection of the disclosure of transaction data in financial markets, by data collation and analysis, and from the side reflect the investor sentiment and behavior objectively. Foreigner mainly uses closed-end fund discount, IPO circulation and first-day earnings, trading volume, the proportion of zero-share trading as indicators. Baker and Wurgler (2007) chose to use the closed-end fund discount as an alternative to investor sentiment and find that a closed-end fund discount would, to some extent, well reflect changes of investor sentiment in the stock market; Meanwhile, Listed first day earnings as an alternative to investor sentiment. Kumar and Lee (2006) will be the proportion of zero-stock trading as an alternative to investor sentiment variables and find that the proportion of zero-stock trading can better reflect the changes of investor sentiment, especially for small-cap stocks, low-yield stocks. At present, the objective indicators of scholars used in China are mainly closed-end fund discount rate, trading volume, the number of new accounts, the number of new shares issued. Liyan Han and Yanran Wu (2007) use the IPO on the first day of listing turnover and the number of accounts on the exchange as the investor sentiment index to study the relationship between investor sentiment and market returns. Qiang Zhang and Shue Yang (2007) use investors' growth rate as an alternative to investor sentiment.

Although the objective indicators are more representative than the subjective indicators, the investor sentiment is the reflection of the investor's inner psychological activity, which is characterized with non-stability, suddenness and infectivity. Therefore, it is difficult to find out accurate grasp and measurement of indicators.

3.3 Comprehensive Index

Subjective and objective index will be affected by the characteristics of the index itself and not affect the emotional factors, so it is not necessarily representative to use such indices as investor emotional agent variables. Therefore, the learners construct the investor sentiment index by judging the characteristic factors of the emotional index and removing the influence of these factors through the data processing.

The most famous of foreign countries is Baker, Wurgler (2006) based on the turnover rate, monthly IPO number, CEFD, IPO first day rate of return, dividend premium index. Baker, Wurgler use the principal component analysis of the comprehensive index. The analysis shows that the index is superior to the previous single index. His research results laid the foundation for the study of the use of comprehensive indicators instead of emotional indicators. Many scholars later studied the market stock prices with reference to such structural emotional indicators. Glushkov (2006) constructed a comprehensive index using eight direct and indirect proxy indicators, such as investor intelligence index, closed-end fund discount, mutual fund inflow, trading volume, CBBC, dividend yield, IPO number and first day income, and found

that the comprehensive indicators can better reflect the changes in investor sentiment.

On the basis of the study of foreign scholars, domestic scholars have begun to use the comprehensive indicators as emotional agent variables. Baihong Lin (2008) selected the IPO first day rate of return, IPO first day turnover, A-share market average turnover rate, closed-end fund discount rate of these four investor sentiment indicators, and extracted the main component as an alternative to emotional indicators. Lu Yang (2015) selected the mainland A-share market IPO number, IPO first-day rate of return, closed-end fund discount rate, the number of new accounts, market turnover and consumption Confidence index in June 2002-December 2013 by monthly data as a proxy for emotional changes in the proxy variable. Qingju Luo, Pengbo Lu (2010) measured the emotional indicators of the four major categories of 14 investors, using the principal component analysis method, selected four types of investor sentiment indicators suitable for the characteristics of China's securities market, found that closed-end fund discount Rate, turnover are concentrated to reflect the changes in investor sentiment in China. Compared with the previous single indicators, comprehensive indicators can be more comprehensive and truly reflect the changes of investor sentiment, the conclusions are more reasonable.

4. The Influence of Investor Sentiment on Stock Market

4.1 Foreign Research Results

The study of investor sentiment has started earlier and more mature abroad. Most foreign scholars have to establish the model and then use the method of empirical analysis to discuss the relationship between investor sentiment and stock market, and have confirmed that investor sentiment and the stock market have high degree relevance. The most classic research is Brown, Cliff (2007). They use the comprehensive index as the proxy variable of investor sentiment, and use empirical analysis to study the relationship between investor sentiment and short-term market returns. Investor and institutional investor sentiment are closely linked to the same period of stock market earnings. Investor sentiment constitute a systemic factor that affects the stock market, and the emotion and stock market returns are positively correlated in the weekends, and on the opposite side of the month, and show that the emotions are not available for future stock returns to predict. Baker and Wurgler (2006) found that stocks with higher returns in the future had lower investor sentiment at an early stage, and then they further found that the negative relationship between investor sentiment and stock returns would vary with the stock type, The negative correlation between investor sentiment and expected return is more obvious for market types such as small market value, new shares, high volatility, non-profit, non-profit, extreme growth and so on. At the same time, they also find that the emotion is not easy to be valued and difficult to arbitrage stock has a greater impact. This is in line with Glushkov's (2006) discovery of small market capitalization, short issuance time, large volatility and difficult to assess and difficult to arbitrage stocks,

which is more susceptible to emotional impact. Fisher and Statman (2003) compiled investor sentiment index by collecting investor survey data and conducted empirical analysis that the emotions of strategic investors and individual investors were negatively correlated with the future earnings of the market index.

The influence of investor sentiment on the time series of market returns can be divided into two aspects: investor sentiment on market short-term gains and long-term gains, but the research of the former is relatively large. Neal and Wheatley (1998) used closed-end fund discounts, zero-share trading ratios, and mutual fund redemption ratios as a measure of investor sentiment to test their time-series projections for stock returns. Brown and Cliff (2005) systematically studied the recent earnings and found that the investor sentiment was related to the recent market gains. Yu and Yuan (2011) explain the "income-risk" relationship of the stock market based on investor sentiment, and think that the difference of investor sentiment will cause different changes with the "income-risk" relationship in the market.

4.2 Domestic Research Results

Domestic research on investor sentiment began in 2000, many studies are based on foreign research, Because of the immature stock market in China. Research areas are mainly investor sentiment and the relationship between stock market returns in current.

Representatives of domestic research such as Yumei Jiang and Mingzhao Wang (2010): They use the nonparametric method and the regression model to analyze the influence of emotion on the combination of the characteristics of the company, and examine the correlation between the emotion and the combination of the various characteristics. The empirical result showed that the subjective degree of the stock valuation and the investment subject’s difference of the existing characteristics make the stock returns have different influence on the sensitivity of the emotions. The investor sentiment has a certain influence on the relative excess returns of the current and future short-term, and the influence of the emotions on the cross-section of the income. Qiang Zhang, Shue Yang, Hong Yang (2007) used the empirical analysis to study how the investor sentiment affected the stock price by means of the GARCH-M (1, 1) model. In addition, Yumei Jiang and Mingzhao Wang also found that institutional investors and large market returns of the stock seem to be more closely, and found that the emotions mainly exist in institutional investors. Shida Huang, Zhen Wang(2015) incorporated emotional variables into the CAPM model and effectively explained some financial visions through Avramov and Chordia two-step regression, confirming that emotions are an important factor to influence stock trading. Xiaoxiao Li and Chunpeng Yang (2008) put the investor sentiment into the risk measurement of securities investment, and put forward to two kinds of cognitive risk measurement methods based on behavioral finance, and established a cognitive income model based on investor sentiment, and studied the relationship between risk and cognitive income.

Jiangchuan Lu, Jun Chen(2012) based on the Fama-French three-factor model, and selected weekly data and monthly data, while the data segmentation, the specific investor sentiment is divided into optimistic, pessimistic, extreme, non-extreme four categories. The results showed that different types of investor sentiment have an asymmetric effect on stock cross-sectional gains. For example, the impact of weekly investor sentiment on stock returns is more pronounced than that on non-extreme emotions of the proceeds. Baigong Lin (2008) studied the yield of listed companies in Shanghai and Shenzhen by constructing a comprehensive sentiment index. The study showed that investor sentiment has a significant impact on the cross-sectional gain of stock, with diverse financial conditions market shares, there is a significant difference in the degree of influence of the investor sentiment index. Fenghua Wen (2014) and so on in the article using the virtual variable regression model, GARCH model and RV-AR model to investigate the emotional characteristics of investors on the stock price of asymmetric effect found that emotions are divided into positive emotions and negative emotions. This is more fitting with the China stocks market. By empirical test and analysis, they found that the investor sentiment has a significant impact on the stock yield, but this effect exited a significant asymmetry. Lu Yang(2015) constructed the ARMA-GARCH model to analysis the relationship between investor sentiment and A-share market earnings, and used the Granger causality method to test the relationship .The results showed that investor sentiment is not the factor to impact stock market returns, on the contrary, the volatility of the stock market returns is a reason for investor sentiment changes. Although there are many studies on investor sentiment and stock returns in China, there are many differences in the researcher's point of view, and there is no uniform conclusion about the causal relationship between investor sentiment and stock returns. Since the selection of indicators and different research methods are used, the results are different.

The impact of different characteristics on the price of stock is a new topic in recent years, and has not yet formed a complete research system. In the future study, investor sentiment can be divided more subtleties, and then study the emotional characteristics of the impact of the stock price of the asymmetry better.

5 Summary and Prospects

Foreign research on investor sentiment and stock price was earlier. The financial market development brought about by a series of financial vision to the behavioral finance to great development. Foreign scholars have also established a series of theoretical models, formed a relatively complete theoretical system. So far they have a fruitful theoretical result in this area. The domestic stock market’s life cycle is short. All aspects of the system are not perfect. One factor of this is that the national conditions of the market supervision is too large and the policy is endless, to a certain extent hindered the overall development of financial markets, resulting in different periods of stock market performance and investor sentiment system deviation, so the domestic scholars on the investor sentiment research are built on the results of foreign

research, there is no good combination of our own facts.
So far, whether in foreign countries or in the country, most of scholars mainly study the definition of investor sentiment, investor sentiment indicator, investor sentiment on the overall effect of stock prices and investors on the stock market forecast.

Investor sentiment is a broad and abstract concept. The current academic community does not have a unified definition of standards, and each scholar has its own understanding and view. Besides, foreign scholars tend to think that investor sentiment is a deviation from future earnings based on the investor psychology and cognitive. Direct index can be directly obtained with the investor sentiment data in the market, but its representation and effectiveness is questionable. Although the indirect index is more representative, but this type of index is through the analysis of the index users and experience to judge, with a certain degree of subjectivity, so the indirect index cannot become a unified research standards for investor sentiment. Based on the shortcomings of these two emotional indices, scholars use more scientific methods to construct more comprehensive indicators that meet the research needs. Through empirical research show that this kind of index is more comprehensive and tangible to reflect the characteristics of investor sentiment.

In this paper, a series of classical models are used to study the relationship between investor sentiment and stock market, such as noise trading theory (DSSV model), investment structure theory (LST model), asymmetric GRACH model, three factor model, Granger causality analysis model. Domestic research is still in the initial stage, mainly in the form of linear regression and other simple empirical research, due to modeling and other issues, so the stability and reliability of the conclusion is to be improved.

I believe that any research needs to use precise data. The data is the fundamental of the research. Effective data directly affect the quality of the research results. Our country is facing a major problem which is not able to support the integrity of the study of continuous and effective data, Therefore, the bottleneck of investor sentiment study in China is the acquisition of emotional index. How to obtain a more comprehensive and scientific survey index will be the future focus. It can build a more scientific and effective investor sentiment index. Today is the era of large data, but also the network from the media development of the boom. We should make good use of these resources to obtain more complete and effective data, which for the domestic stock market research has epoch-making significance.

Moreover, the process of selecting the emotional indicators is too single during the study period in our country. Most of the domestic scholars use direct indicators such as "CCTV read" index, good talk index to replace the investor sentiment indicators, and the continuity and availability of such survey data are all exiting some problems, so the domestic research and development is slow. The use of comprehensive indicators to build the investor sentiment is undoubtedly a better development

direction. Our scholars should also move in this direction to make more objective and more convincing research results. A lot of domestic research and study are carried out on the institutional investor sentiment. The individual investor sentiment is almost blank in our country. l think that institutional investor sentiment should be combined with individual investor sentiment to study, which better reflects the overall market response.

References

De Long, J. B., Shleife, r. A., and Summer, L. H. (1990) "Positive feedback investment strategies and destabilizing rational speculation", *Journal of Finance*, vol.45, pp. 379-396.

Baker, M., Wurgler, J. (2006) "Investor Sentiment and the Cross-section of Stock returns", *Journal of Finance*, vol. 61, no. 3 , pp. 1645-1680.

Baker, M. and Wurgler J. (2007) "Investor Sentiment In the Stock Market", *Journal of Economic Perspective*, vol. 21, no. 2, pp.129-151.

Yu, J., Yuan, Y. (2011) "Investor Sentiment and the Mean-variance Relation", J*ournal of Financial Economics*, vol. 100, pp.367-381.

Baker, M., Stein, J. C., Wurgler, J. (2003) "When does the Market Matter? Stock Prices and the Investment of Equity-dependent Firms", *The Quarterly Journal of Economics*, vol. 118, no. 2 pp. 969-1005.

Brown G.W., M.T. Cliff. (2004)"Investor Sentiment and the Near-term Stock Market", *Journal of Empirical Finance*, vol. 11, pp. 1-27.

Brown G.W., M.T. Cliff. (2005)"Investor Sentiment and Asset Valuation", *The Journal of Business*, vol. 78, no.8, pp. 405.

Fisher K, Statman. (2003)"Consumer Confidence and Stock Returns", *Journal of Portfolio Management*, vol. 30, pp. 115-128.

Lee C., Shleifer A. and Thaler R. (1991) "Investor Sentiment and the Close-end Fund Puzzle" , *Journal of Finance*.

Neal, R., S.M. Wheatley. (1998) "Do Measures of Investor Sentiment Predict Returns?" , *Journal of Financial and Quantitative Analysis*, vol. 33,no.4, pp.523.

Qiu L.X., Welch .I. (2004) "Investor Sentiment Measures", *Brown University Working Paper*.

Glushkov, D. (2006) "Sentiment Beta", *University of Texas Working Paper.*

Kumar A., C.M.C. Lee. (2006) "Retail Investor Sentiment and Return Movements", *The Journal of Finance*, vol. 61, no. 5, pp. 2451-2486.

Qiang Zhang, Shue Yang, Hong Yang. (2007)"An Empirical Study on Investor Sentiment and Stock Returns in Chinese Stock Market", *Systems engineering*, vol.7,

pp. 13-17.

Qiang Zhang, Shue Yang. (2009) “Noise Trading, Investor Sentiment and Stock Returns”, *System Engineering Theory and Practice*, vol. 3, pp. 420-429.

Yumei Jiang, Mingzhao Wang. (2010) “Investor Sentiment and Stock Returns: An Empirical Study on the Overall Effect and Cross-sectional Effect”, *Nankai Management Review*, vol. 3.

Kun Cheng, Renhe Liu. (2005) “A Study on the Interaction between Investor Sentiment and Stock Market”, *Shanghai Economic Research*, vol. 11, pp. 86-93.

Lixu Chi, Xintian Zhuang. (2011) “The Influence of Chinese Investor Sentiment on Stock Returns-Based on Panel Data”, *Manage Comments*, vol. 6, pp. 41-48.

Meijin Wang, Jianjun Sun. (2004) “China Stock Market Returns, Earnings Volatility and Investor Sentiment”, *Economic Research*, vol. 10, pp. 75-83.

Meijin Wang, Jianjun Sun. (2014) “The Impact of Stock Market Policy on Individual Securities Investors' Behavior-Behavioral Finance Theory Explanation of China's Stock Market downturn”, *Quantitative Economic, Technical and Economic Research*, vol. 6, pp. 141-146.

Shida Huang, Zhen Wang.(2015) “An Analysis of the Impact of Investor Sentiment on Asset Price-An Empirical Study Based on China Stock Market”, *Price Theory and Practice*, vol. 11, pp. 109-111.

Fenghua Wen, Jinli Xiao,Chuangxia Huang.(2014) “A Study on the Influence of Investor Sentiment Characteristics on Stock Price Behavior”, *Journal of Management Science*, vol. 3, pp.61-69.

Jing Lu, Yuan Zhou. (2015) “The Impact of Investor Sentiment on Stock Price-An Empirical Analysis Based on AH Stock Cross-listed Stock”, China Management Science, vol. 11, pp. 22-28.

Chuan Wang. (2014) “The Impact of Investor Sentiment on the Returns and Volatility of Stock Market: An Empirical Study Based on the Net Inflow of Open-ended Equity Funds”, *China Management Science*, vol. 9, pp. 49-56.

Yongdong Shi, Zhen Wang. (2015) “Does investor sentiment affect the "risk-benefit" relationship?-from China's A-share market test”, *The Practice and Understanding of Mathematics*, vol. 3, pp. 114-125.

Wei Shan, Chunpeng Yang. (2011) “Research on Investor Sentiment in Financial

Market", *Journal of South China University of Technology*, vol. 3, pp. 33-43.

Jiangchuan Lu, Jun Chen.(2012) "Study on the Asymmetric Effects of Investor Sentiment on Stock Cross-sectional Profits", *Prediction*, vol. 5, pp. 52-57.

Liwen Liu, Zhen Wang. (2016) "An Empirical Study on the Impact of Investor Sentiment on Different Types of Stock Returns", *Financial Theory and Practice*, vol. 2, pp. 90-97.

Xiaoxiao Li, Chunpeng Yang.(2008) "Behavior Pricing Model Based on Investor Sentiment", *Journal of Qingdao University*, vol. 4, pp. 95-98.

Zhigao Yi, Ning Mao, Li Wang. (2011) "Stock Market Investor Emotion Research: Formation, Measurement and Application", *Exploring Economic Problems*, vol. 11, pp.79-84.

Zhiyan Lv. (2013) "A Study on the Influence of Investor Sentiment on Stock Market Returns in China", *Dongbei University of Finance and Economics*, vol. 12.

Lu Yang. (2015)"A Study on the Relationship between Investor Sentiment and A-share Market Revenue", *Chongqing University*.

Qinyun Lai, Min Zhu.(2012) "Research on Portfolio Model Based on Investor Sentiment", *China Management Science*, vol. 6, pp. 47-55.

Liyan Han, Yanran Wu.(2007) "Imperfect Rationality, Investor Sentiment and Mystery of closed-end funds", *Management World*, vol. 3, pp. 51-61.

Baihong Lin. (2008) "The Measurement of Chinese Investor Sentiment Index and Its Influence on Stock Market Returns", *Xiamen University*.

Qingju Luo, Pengbo Lv.(2010) "Research on Constructing Investor Sentiment Index by Principal Component", *Management Forum*, vol. 2, pp. 114-120.