RELATIONSHIP BETWEEN CONSUMER CONFIDENCE AND STOCK MARKET INDEX IN VIETNAM: RESEARCH IMPACTS OF THE PASSION OF COVID-19

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ARTICLE INFO

ABSTRACT

DOI:
10.52932/jfm.vi3.404

Received:
March 12, 2023

Accepted:
June 20, 2023

Published:
June 25, 2023

Keywords:
Consumer confidence; Stock market index.

JEL Code:
O16; G23; H83

The article, studies the relationship between consumer confidence and the stock market index in Vietnam’s stock market in the context of the Covid-19 pandemic shock, data collected from 2012Q1 to 2021Q4 from Nielsen data sources. Consumer confidence is measured by the consumer confidence index (CCI), and the stock market index (SMI). The authors use the P.VAR model to solve the set goals. Research results show that there is a strong positive relationship between consumer confidence and the stock market index in Vietnam in the period from 2012 to 2021. In addition, shocks of the past CCI and SMI value also affect current CCI and SMI values. This shows that when consumer confidence is in a positive direction, the SMI will also be in a positive direction and vice versa. In addition, the results showed that Covid 19 did not significantly affect the above relationship. From the research results, the authors propose governance implications to attract more investors to participate in the stock market, contributing to promoting capital in the circulating economy more effectively.

1. Introduction

Vietnam’s stock market in the period 2012 to 2021 has many innovations as on February 6th, 2012, the VN30 index was first launched and changed the payment period by shortening the payment period from T+4 down to T+3. In 2016, this period continued to change and only 2 days remained, and in 2017, derivative securities appeared and the VN-Index at this time increased to 984 points. On April 9th, 2018, VN-Index set a new peak of 1,204 points and by the end of 2019, the VN-Index decreased to 961 points. However, by 2020, due to the impact of the COVID-19 pandemic, Vietnamese stocks experienced sharp declines. Despite a decline in 2020, Vietnam’s stock market quickly recovered in 2021. According to Mirae Asset Vietnam Securities Co., Ltd.,

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Vietnam’s economy initially picked up again in October 2021 as provinces have gradually eased social distancing and promoted vaccination against COVID-19. Sharing the same view, analysts from VNDIRECT Securities Joint Stock Company said that market sentiment was more positive in October 2021 after the government introduced a policy to ease the distance in Hanoi and Ho Chi Minh City, at the end of the trading session on November 2nd, 2021, the VN-Index increased to 1,452.46 points. With positive belief, investors just started to use their idle money to switch to the stock investment channel, and investors with large profits made the cash flow continue to pour strongly into stocks. So why has such a large fluctuation is related to investors’ confidence in the stock market? This is an issue that always attracts domestic and foreign managers and researchers. To date, there have been many studies on the impact of consumer confidence on the stock market index, but research on the interrelationship of these two factors in Vietnam is still very limited, especially in the Covid-19 pandemic. Therefore, the authors want to study to clarify this research gap, and from the research results will propose implications to help investors make the most reasonable investment decisions. That’s why the authors chose the topic “Relationship between consumer confidence and stock market index in Vietnam: Research impacts of the passion of Covid-19” to research and answer the questions posed.

2. Theoretical basis and research

2.1. The concept of the consumer confidence index

The concept of the consumer confidence index: According to Katona (1968), consumer confidence is a way to measure expected changes in income. Katona also argues that consumer confidence includes emotional and intellectual factors. It is the emotional element of optimism and pessimism that has spread to other consumers. United Nations Statistics Division (2015), believes that this is a statistical indicator used to forecast consumer spending trends, and provides information for assessing the current situation and prospects of the economy of a country.

Related studies on the method of measuring consumer confidence index

Research by Curtin, Presser & Singer (2000) shows that factors affecting consumer confidence include: income, inflation, economic growth, unemployment, savings, discretionary spending. The author uses a four year consumer confidence index data set from 1996 to 1999 from Russia and the United States, and there is no need to use a weighted method to calculate the consumer confidence index because the author thinks that with this calculation and the calculation using weights, there is no difference.

Maguire & Eugenia (2014), conducted a survey of consumer confidence in 7 cities, namely Ho Chi Minh City, Hanoi, Da Nang, Can Tho, Hai Phong, Nha Trang, and Dong Hoi with 1000 samples by direct interview method. ANZ calculates the consumer confidence index using the amplification method for 5 questions and each question has 3 answers. The survey subjects are people aged 14 years and over and ANZ publishes the monthly consumer confidence index.

Curtin (2007) conducted consumer surveys in 37 countries. The author divided into 3 main groups based on the difference in reference time.

Group 1: This group covers more than half of the countries, using the EU harmonized questionnaire.

Group 2: Use questions for the past and present with a reference period of 12 months and longer.

Group 3: Using a reference period of 6 months.
model of three Fama-French factors: Size, BE/ME value and market factor. The model is as follows:

\[ E(R_i) = R_f + (E(R_M) - R_f) \beta_i + s_iE(SMB) + h_i(HML) \]

\(E(R_i)\): return for stock list \(i\)

\(R_f\): risk-free return

\(E(R_M)\): the expected return of the entire market

\(s_i\): regression coefficient for factor SMB

SMB: the historical average of small company stock list return - large company stock list return

HML: the historical average of high (book value/market) stock list return - low (book value/market) list return

\(\beta_i\): regression coefficient for the risk premium factor of the stock list

Fama French’s model for the US market during 1963-1991 showed an inverse relationship between size and average return and a positive correlation between BE/ME and medium return.

(3) Experimental model of Chen & Zhang (2010):

Chen & Zhang (2010), built the model on NYSE, AMEX, and NASDAQ from January 1972 to December 2006 as follows:

\[ E(r_i) = \alpha_i + \beta_{i, \text{MKT}} E(r_{\text{MKT}}) + \beta_{i, \text{INV}} E(r_{\text{INV}}) + \beta_{i, \text{ROA}} E(r_{\text{ROA}}) + e_i \]

\(r_i\): Risk-free return

\(\beta_{i, \text{MKT}}, \beta_{i, \text{INV}}, \beta_{i, \text{ROA}}\): coefficients measuring the sensitivity of stock returns

\(E(r_{\text{MKT}}), E(r_{\text{INV}}), E(r_{\text{ROA}})\): market risk premium, investment allocation, return on total assets premium

The author has concluded that expected return has a negative relationship with investment on I/A assets, with asset growth with the ME/BE ratio, and with past long-term revenue growth. In addition, the author also thinks that return has a positive relationship with ROA.
2.3. Relationship between the consumer confidence index and stock index

There are many studies on the impact of consumer confidence and stock index:

Jansen & Nahuis (2003) used data from 11 European countries including Belgium, Denmark, France, Germany, Greece, Ireland, Italy, the Netherlands, Spain, Portugal, and the UK. Data from January 1986 to August 2001, excluding Greece from 1988 to October 2001, Portugal from 1988 to January 2001, and Spain from 1986 to July 2001. The author uses Granger causal model to determine the relationship between CCI and SMI. The research results show that stock returns and changes in sentiment are positively correlated for nine countries: Belgium, Denmark, France, Switzerland, Italy, the Netherlands, Spain, and Portugal, USA excluding Germany and UK.

Hsu, Lin & Wu (2011) used monthly panel data for 21 countries from 1999 to 2007. The author used FE, MG, cointegration test and Granger causality method to determine the relationship between CCI and SMI. The research results show that there is no long-term relationship between the stock index and the consumer confidence index, but only a short-term relationship.

Van Zandweghe (2019) using the S&P 500 index and the University of Michigan consumer sentiment index and using the Granger test confirmed that the CCI and SMI are highly correlated, and change from time to time. In addition, the study also shows that in the crisis period, these two indicators are more closely linked than in the normal period.

Ayben & Akkaya (2017) use monthly data for the period January 2007 and June 2016. Using Markov vector autoregression model (MS(M)-VAR(p)). The results show that stock returns impact the S&P 500 price index and show that market pessimism has a larger impact on stock returns during declining markets.

Sum (2014) uses monthly data from 31 countries. The sample size used is quite large at 7206 monthly observations of the countries. Least squares regression (OLS) was used to estimate the coefficients related to consumer confidence and the data was pooled together for regression analysis. The results of the study suggest that consumer confidence has a positive impact on stock market returns.

Fisher & Statman (2003) used AR time series models for consumer confidence data series from January 1978 to December 2002 (University of Michigan) and from May 1977 to December 2002 (Conference Board) and stock index data for the S&P 500, Small-Cap and Nasdaq from 1995 to 2002, monthly, six months, and twelve months. The author believes that there is an inverse relationship between consumer confidence and stock returns in the next month, in the next 6 months, and in the next 12 months. Although there is a reverse relationship between consumer confidence and stock returns in the future, there is a relationship and statistical significance between changes in consumer confidence and profits stock, that high profits stock boosts consumer confidence.

Bannigidadmath (2020), using monthly data on Indonesia stock index returns and consumer confidence index from Datastream and FRED Economic Data. The sampling period of the data is from March 2003 to April 2019. The author uses a time series regression model and shows that changes in consumer sentiment do not predict excess returns over the Indonesian market index. However, the author argues that lagged changes in consumer sentiment will positively predict stock returns in three sectors: oil, gas, consumer goods, and consumer services.

3. Research model and methods

Nitin et al. (2017), used an econometric approach using the VEC model to determine the relationship between the consumer sentiment index and the Indian stock market index. The results indicate that the Indian stock market
is highly sensitive to consumer sentiment in the short term as well as in the long term. The Consumer Sentiment Index (CSI) data is provided by the Bombay Stock Exchange (BSE), the Center for Monitoring the Indian Economy (CMIE) and the Center for Survey Research, University of Michigan. Data has been released on a daily basis. The author has sourced daily index data from the National Stock Exchange (NSE). The data were obtained between March 1st, 2016 and February 1st, 2017. The model is defined as follows:

\[
NIFTY_t = \beta_0 + \beta_1 CSI_t + \mu_t
\]

NIFTY_t: NSE Nifty market index
\mu_t: surplus
CSI_t: consumer sentiment index

Sum (2014) based on monthly data analysis of 31 countries, the results show that business confidence and consumer confidence have a positive influence on stock market returns. The author argues that a change in consumer confidence has a stronger impact on stock market returns across countries than a change in business confidence. The sample size used by the author is quite large, with 7,206 monthly observations of different countries.

\[
RR_{it} = a + \phi \Delta BC_{it} + \psi \Delta CC_{it} + \epsilon_{it}
\]

RR_{it}: stock market returns.
\epsilon_{it}: surplus
BC_{it}: business confidence
CC_{it}: consumer confidence

Inheriting the above studies, the author will implement the PVAR model between the consumer confidence index and stock index for Vietnam to consider the interaction of the relationship of the two variables as follows:

\[
SMI_t = \beta_0 + \beta_1 CCI_t + \beta_2 SMI_{t-i} + \mu_t
\]

\[
CCI_t = \beta_0 + \beta_1 SMI_t + \beta_2 CCI_{t-i} + \mu_t
\]

SMI_t: stock index quarter t
SMI_{t-i}: stock index quarter t-i
CCI_t: consumer confidence index quarter t
CCI_{t-i}: consumer confidence index quarter t-i

Research data: The author will collect data on the consumer confidence index and stock market index of Vietnam. The author will collect secondary information from Nielsen data and VNIndex from 2012Q1 to 2021Q4 for Vietnam.

Research method: In this study, the author uses the PVAR model between the consumer confidence index and stock index to analyze the interaction between two variables CCI and SMI, specifically as follows: (1) Test the stationarity of two data series CCI and SMI through graph analysis, autocorrelation function analysis and autocorrelation diagram, unit root test and \( \Delta \) trend variable regression to consider the trend calculation for variables CCI, SMI. (2) Find the optimal delay for the PVAR model and test Granger causality. (3) Estimating the PVAR model with variables after testing for stationarity. Then conduct an analysis of variance decomposition, analysis of repulsion function, and stability of the model.

4. Research results
4.1. Stationarity test

Based on analysis of stationary testing through graph analysis, analysis of autocorrelation function and autocorrelation diagram, unit root test, and regression of \( \Delta \) trend variable to consider trend calculation for variables CCI, SMI, CCI_PCA, and SMI_PCA. To perform the stationary series test of the variables in the study, the author uses the Augmented Dickey-Fuller test. The results after testing:
The p-value $= 0.2807 > \alpha = 10\%$ or the absolute value of the statistic $\tau$ of the CCI variable is 2.0120 < the value $\tau$ at the 1%, 5%, and 10% significance levels, so the hypothesis $H_0$ is accepted. The CCI series has a unit root, the CCI series is a non-stationary series. Therefore, after performing the first difference, the CCI data series have become stationary data series. The p-value $= 0.0000$ is very small < $\alpha = 10\%$ or the absolute value of the statistic $\tau$ of the CCI and SMI variables > the value $\tau$ is at 1%, 5%, and 10% significance level, so hypothesis $H_0$ is not accepted. is a CCI series, SMI has no unit root, CCI and SMI series are stationary series. Therefore, DCCI and DSMI can be included in the PVAR model to estimate.

### Table 1. Stationarity test results (CCI and SMI)

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF</th>
<th>Significance level 1%</th>
<th>Significance level 5%</th>
<th>Significance level 10%</th>
<th>P-value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCI</td>
<td>-2.012</td>
<td>-3.6156</td>
<td>-2.9411</td>
<td>-2.6091</td>
<td>0.2807</td>
<td>Non-stationary series</td>
</tr>
<tr>
<td>SMI</td>
<td>1.240</td>
<td>-3.6105</td>
<td>-2.9390</td>
<td>-2.6079</td>
<td>0.9979</td>
<td>Non-stationary series</td>
</tr>
</tbody>
</table>

### Table 2. Stationarity test results (CCI and SMI)

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF</th>
<th>Significance level 1%</th>
<th>Significance level 5%</th>
<th>Significance level 10%</th>
<th>P-value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCCI</td>
<td>-10.096</td>
<td>-4.2191</td>
<td>-3.5331</td>
<td>-3.1983</td>
<td>0.0000</td>
<td>Stationary series</td>
</tr>
<tr>
<td>DSMI</td>
<td>-4.8078</td>
<td>-4.2191</td>
<td>-3.5331</td>
<td>-3.1983</td>
<td>0.0022</td>
<td>Stationary series</td>
</tr>
</tbody>
</table>

4.2. Implementation of the PVAR model

The optimal delay

### Table 3. The optimal delay

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
<th>HQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-314.9451</td>
<td>-</td>
<td>152106.0000</td>
<td>17.6081</td>
<td>17.6960</td>
<td>17.6388</td>
</tr>
<tr>
<td>1</td>
<td>-305.5928</td>
<td>17.1459*</td>
<td>113066.3000*</td>
<td>17.3107*</td>
<td>17.5746*</td>
<td>17.4028*</td>
</tr>
<tr>
<td>2</td>
<td>-303.7443</td>
<td>3.1834</td>
<td>127784.4000</td>
<td>17.4302</td>
<td>17.8701</td>
<td>17.5838</td>
</tr>
<tr>
<td>3</td>
<td>-300.7089</td>
<td>4.8904</td>
<td>135686.9000</td>
<td>17.4838</td>
<td>18.0996</td>
<td>17.6988</td>
</tr>
</tbody>
</table>

After estimating and finding the optimal delay, the authors found that the appropriate optimal delay is 1.

**Granger causality test**

In the PVAR model, the Granger causality test tells which variable in the model is affected. The results of the Granger causality test with lag 1 are as follows:
the 2nd period, the CCI shock only contributed 92.5454% to itself and the SMI shock affected 7.4546% to the CCI shock. This shows that in the beginning the CCI shock is affected by itself, and in the long run, the CCI is an additional effect of the SMI shock, which is approximately 7.3942%.

Table 7. The decomposition of variance of DSMI

<table>
<thead>
<tr>
<th>Period</th>
<th>S.E</th>
<th>DCCI</th>
<th>DSMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>71.0087</td>
<td>2.6854</td>
<td>97.3146</td>
</tr>
<tr>
<td>2</td>
<td>76.9310</td>
<td>9.8501</td>
<td>90.1499</td>
</tr>
<tr>
<td>3</td>
<td>78.3185</td>
<td>9.9132</td>
<td>90.0868</td>
</tr>
<tr>
<td>4</td>
<td>78.5716</td>
<td>10.3237</td>
<td>89.6763</td>
</tr>
<tr>
<td>5</td>
<td>78.6412</td>
<td>10.3548</td>
<td>89.6452</td>
</tr>
<tr>
<td>6</td>
<td>78.6556</td>
<td>10.3843</td>
<td>89.6157</td>
</tr>
<tr>
<td>7</td>
<td>78.6598</td>
<td>10.3883</td>
<td>89.6118</td>
</tr>
<tr>
<td>8</td>
<td>78.6608</td>
<td>10.3905</td>
<td>89.6095</td>
</tr>
<tr>
<td>9</td>
<td>78.6611</td>
<td>10.3909</td>
<td>89.6091</td>
</tr>
<tr>
<td>10</td>
<td>78.6611</td>
<td>10.3910</td>
<td>89.6089</td>
</tr>
</tbody>
</table>

And the SMI shock in the first period contributed 97.3146% to itself, the CCI shock affected 2.6854% of the SMI. In the long run, the ratio of the impact of the CCI shock on SMI gradually increases, while the SMI shock on itself decreases gradually.

Analysis of the impulse response function

The authors use the push response function IRF to consider the effects of shocks of CCI and SMI variables. Results of the push response of the variables in the research model

Firstly, if the value of CCI in the past decreases, the current CCI also decreases, from the second quarter to the third quarter, it tends to increase, the fourth quarter decreases, and in the fifth quarter, it begins to stabilize.

Second, when there is a shock from the decrease in CCI, the SMI also dropped sharply until the second quarter, it increased again. However, by the third and fourth quarters, it continued to decrease and stabilize later on.
Third, the shock from SMI has an impact on CCI but is not strong. Starting from the third quarter, CCI tends to be stable. Fourth, the shock from the past SMI strongly affects the current SMI, it will be more stable in the fourth quarter.

The authors use the impulse response function IRF to examine the effects of shocks of CCI and SMI variables during the Covid-19 pandemic period from 2019Q1-2021Q4. The following results:

First, the impact of the stock market index (SMI) on consumer confidence (CCI): From 2019Q1 - 2020Q4 shows that CCI and SMI fluctuate quite strongly. When SMI increases, CCI also increases and the degree of increase is more than that of SMI increases and vice versa when SMI decreases, CCI also decreases. However, from 2021Q1, the SMI tends to increase, but the CCI tends to decrease.

Second, the impact of consumer confidence (CCI) on the stock market index (SMI) tends to be different, specifically in 2020Q1 when consumer confidence tends to increase, the SMI will decrease strongly. In 2020Q2, consumer confidence tends to decrease, while SMI increases slightly. However, in 2020Q3, and 2020Q4, the impact of CCI on SMI is in the same direction. In 2021, when consumer confidence decreases but SMI increases significantly, specifically on April 20th, 2021, the VN-Index set a historic peak after 20 years at 1,268.28 points, until 2021Q4 consumer confidence with only a slight increase, the VN-Index reached 1,500.81 points on November 25th, 2021, the highest in 21 years of operation. In addition, during the Covid-19 pandemic, the correlation between the CCI and SMI was weak (0.138), but still a positive correlation.

Model stability
The results show that all solutions are inside the unit circle, no solution is outside the unit circle. This shows that the PVAR model responds to stability.

Figure 1. Impulse response results
The research results show that there exists a close cause and effect relationship between consumer confidence and the stock market index in Vietnam during the survey period. In addition, the shocks of the past CCI and SMI values also affect the current CCI and SMI values. This shows that when consumer confidence is in a positive direction, the SMI will also be in a positive direction and vice versa. However, when considering the shock in the covid-19 pandemic alone, the correlation between CCI and SMI variables is quite weak, but still a positive correlation.

From the research results, the authors propose the following implications:

- The stock market operates transparently to increase consumer confidence. Thus, attracting consumers to invest in the stock market.

- Securities listed companies disclose clear, transparent and complete information to help investors have sufficient information when looking up to make decisions, thus increasing consumer confidence, contributing to promoting the stock market efficiently.

- There should be a consulting support department to provide information to investors so that they can increase their confidence when making investments in the stock market.

References


