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Consumer Confidence and Economic Activity: What Causes What? *

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Based on the data from ten Organization for Economic Co-operation and Development (OECD) countries, this paper explores the evidence as to whether a consumer confidence indicator is a leading, coincident, or lagging measurement of economic activity, and examines factors that affect the consumer sentiment index (*CSI*). Determinants of *CSI* and the causal relationship between *CSI* and economic activity vary across countries. In some countries, however, evidence is found that *CSI* contains not only leading information but also coincident information, which acts as a mood signal for assessing the changes in economic activity. Moreover, it is found that consumer sentiment can be driven by both economic factors such as wealth and interest rate, as well as non-economic factors such as emotional state.

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Keywords: consumer sentiment index, leading/coincident information, share price index, interest rate, smoothed probability, wealth and emotional effects

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1. INTRODUCTION

Consumers are regularly surveyed in many countries to assess the past, current, and future economic and financial conditions and to publish the consumer sentiment index (*CSI*) by compiling survey data well before official data on consumer spending becomes available. One of the advantages of the sentiment data is that it is "timely" (i.e., available monthly), making it a good measure for predicting economic activity.

In general, measures of consumer confidence or sentiment tend to be perceived as barometers of the state of the economy. But do consumers anticipate or react to changes in the state of the economy? The answer to this question is important because leading information may be useful for forecasting purposes, while lagging or coincident information is more useful as a mood signal for assessing the changes in economic activity.

In literature, a number of empirical studies have examined the role of information and the effectiveness of consumer sentiment as sources of aggregate economic movements. The studies have stressed the role of consumer sentiment as a tool for predicting economic activity. In particular, *CSI* is described as an important determinant of consumer spending as a leading indicator that can forecast consumption (for the U.S., Bram and Ludvigson, 1998; Carroll *et al*., 1994; Ludvigson, 2004; Fuhrer, 1993; for the U.S. and the U.K., Easaw *et al*., 2005; for the U.S. and Europe, Dees and Brinca, 2013).[1)] From a similar perspective, this paper explores the causal relationship between movements in *CSI* and economic activity. Specifically, the present paper seeks to find an answer to the following question: does an increase in sentiment cause the gross domestic product (*GDP*) to increase because people feel optimistic about the economic outlook and spend more, or does an increase in *GDP* cause a rise in sentiment because people are (or feel) wealthier?

In previous analyses performed with data from multiple countries, the

[1)] Fuhrer (1993) finds that sentiment index plays a smaller role in predicting the changes in consumption expenditure than forecasting real income.

association between *CSI* and *GDP* appears to vary substantially across countries. For example, Golinelli and Parigi (2004) find that among the eight countries they singled out, *CSI* possesses both coincident and leading information for output in Germany, the U.K., and the U.S. Santero and Westerlund (1996) also find that among the eleven countries they studied, there is a correlation between consumer sentiment and economic output, but it is weaker than the correlation between business sentiment and economic output.[2] Moreover, Matsusaka and Sbordone (1995) and Gayer (2005) finds that consumer confidence possesses the predictive power for the variation of *GDP*. Even after controlling for economic fundamentals, such as money supply, government spending, and material prices, *CSI* is still identified as an important source of variations in economic output (Matsusaka and Sbordone, 1995).

Previous studies have primarily focused on investigating the role of sentiment as a leading indicator of economic activity. Although Golinelli and Parigi (2004) find that *CSI* can be characterized as a coincidental indicator for the U.S., their finding is limited to atypical periods such as oil shock, stock market crash, Gulf War, EMS crisis, and 9.11 terrorist attacks. Thus, this paper contributes to the existing literature by finding stronger evidence regarding the role of sentiment as a coincident or lagging indicator of economic activity and by identifying economic and non-economic determinants of *CSI* in various countries.

To distinguish this study from previous ones, I have taken a relatively large sample consisting of ten Organization for Economic Co-operation and Development (OECD) countries in various regions of the world: three in Europe (Germany, the U.K., and France), two in Oceania (Australia and New Zealand), three in North America (the U.S., Canada, and Mexico), and two in Asia (Japan and Korea). These countries are singled out by adding Mexico and Korea, which are emerging countries, to the sample countries used in previous studies (Golinelli and Parigi, 2004; Santero and Westerlund, 1996).

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[2] Christiansen *et al*. (2014) find that business confidence is a better predictive indicator of the U.S. recession than consumer confidence.

Furthermore, in order to identify the determinants of *CSI*, estimation is performed with a non-economic variable of emotional state, which is proxied by smoothed probabilities for *CSI* extracted from a simple Markov switching model, as well as macroeconomic and financial variables such as *GDP*, share price index (*SHPI*), short-term interest rate (*STIR*), inflation rate (*INFR*), and unemployment rate (*UEMR*).

Table 1 summarizes the similarities and differences among the three main features of *CSI* found in the existing literature. Simiarly, this paper finds that *CSI*s of all countries except Australia, the U.K., and Mexico measure leading economic activity. Moreover, in the univariate regression of *CSI* only on *GDP*, *CSI*s of all countries except Australia, New Zealand, and Japan are found to contain coincident information that corresponds to the current economic activity. In the multivariate regression with aforementioned other variables as control variables, *CSI*s of Germany, France, and Mexico are found to have such. These results suggest that consumers are likely to react to the changes in the state of economy.

Although consumer sentiment is usually driven by systematically varying economic factors, it may be also driven by non-systematically varying non-economic factors, including psychological factors such as emotions and consumer expectations. Katona (1968 and 1975) argues that *CSI* measures attitudes and expectations of consumers about financial and economic conditions and may not be a precise measurement of economic evolution because it relies on the subjective nature of consumers. Doms and Morin (2004) and Starr (2012) find that news coverage of non-fundamental factors about economic activity exerts a significant effect on changes in consumer sentiment. Moreover, assuming that the residuals from regression of *CSI* on its economic determinants contain non-economic information, Garner (1981) finds that non-fundamental unique events, such as Watergate and OPEC in 1973-1974, affect *CSI*. These studies suggest that *CSI* is likely to contain non-economic information. In turn, this paper also examines whether consumer confidence can be explained by non-economic factors such as emotional state, in addition to standard economic determinants of consumption,

Table 1 Summary of Three Main Features of *CSI* in Literature

A. *CSI* Possesses a Predictive Power for Consumption Expenditure.

Literature	Sample Period	Variables	Empirical Methods	Main Findings
Bram and Ludvigson (1998) for the U.S.	1967:3Q -1996:3Q	Consumer confidence index, real stock price index, real labor income, consumer spending, and three-month Treasury bill rate	Nonlinear least squares regression allowing for an MA(1) process in the error term	Conference Board's consumer confidence index has a lagged effect (forecasting power) on total personal consumer spending.
Carroll *et al*. (1994) for the U.S.	1955:Q1 -1992:Q3	Consumer sentiment index, private consumption expenditure (PCE), real labor income, change in unemployment and in a 3-month Treasury bill rate, and the percentage change in the S&P 500 stock price index	Nonlinear least squares instrument variable regression allowing for an MA(1) process in the error term	The lagged consumer sentiment index has an explanatory power for current changes in household spending on consumption of motor vehicle, other goods, and services.
Ludvigson (2004) for the U.S.	1968:Q1 -2002:Q4	Consumer confidence, real stock price, labor income, consumption expenditure, and a 3-month Treasury bill rate	Nonlinear least squares regression allowing for an MA(1) process in the error term	The four lags of consumer confidence index help increase the forecasting power (measured in terms of adjusted R^2) for total personal consumption and expenditure growth.
Easaw *et al*. (2005) for the U.S. and the U.K.	1982:Q1 -1994:Q1	Consumer confidence index, income growth, private consumption spending (PCE), and real interest rate	Linear (instrument variable) regression	The consumer confidence index forecasts the household consumption of durable goods.
Dees and Brinca (2013) for the U.S. and the euro area	1985:Q1 -2010:Q2	Consumption growth, confidence indicator, real equity prices, short-term interest rate, unemployment rate, and real oil prices	Linear regression and VAR framework	The consumer confidence index can possess a predictive power for consumption expenditures, especially in the case of large changes in household survey.

B. *CSI* Possesses a Predictive Power for Economic Activity (or Recession).

Matsusaka and Sbordone (1995) for the U.S.	1953:Q1 -1988:Q4	Consumer sentiment index, GNP, leading indicator, default risk, technology, price of oil government purchases, money supply	VAR framework along with variance decomposition analysis	The consumer sentiment index explains variations in GNP. That is, economic output can change partially in response to changes in consumer sentiment.
Gayer (2005) for the euro area	-1990:Q1 2003:Q4	Five individual confidence indicator in industry, services, retail trade, construction, and consumer, economic sentiment indicator, business climate indicator, and real *GDP*	VAR framework along with root mean square errors and impulse response and variance decomposition analyses	The economic sentiment indicator improves short-term forecasts one or two quarters ahead of *GDP* growth. - The retail confidence indicator is the only indicator that cannot improve *GDP* growth forecasts.
Golinelli and Parigi (2004) for France, Germany, Italy, the U.K., the U.S., Japan, Canada, and Australia	Different starting period for each country - 2001: Q4 or 2002:Q1	Consumer sentiment index, *GDP* quarterly growth, annualized inflation rate, nominal interest rate, quarterly change in stock prices, unemployment rate, output gap *Included variables for each country differ slightly.	Cointegrated VAR framework along with impulse response analysis and root mean square error (RMSE)	Consumer confidence has some forecasting power for the changes in economic activity (*GDP*) as a leading indicator in Australia, Canada, and Europe for both in-sample and out-of-sample. - It also has coincident information for Germany, the U.K., and the U.S. for in-sample and for the U.S. in shock periods such as oil shock, stock market crash, Gulf war, EMS crisis, and 9.11 terrorist attacks for out-of-sample.

Christiansen *et al*. (2014) for the U.S.	1978:M1 -2011:M12	Consumer sentiment index, NBER US recession dates, 10-year bond yield in excess of a 3-month Treasury bill rate (term spread), federal fund rate, return on S&P 500 index, business confidence index	(Dynamic) probit regression	Consumer and business sentiment indices predict US recessions. - The latter has a stronger predictive power for a recession than the former.
C. *CSI* is Affected by Non-economic Factors such as Economic News and Political Events.				
Garner (1981) for the U.S.	1962:Q1 -1978:Q1	Consumer sentiment index, inflation rate, unemployment rate, stock prices, real disposable income, real debt of household, real financial assets of household	Linear regression with a partial adjustment model	*CSI* contains additional information regarding the Watergate and OPEC events during 1973 and 1974 - It partially helps forecasts, but its role is limited.
Starr (2012) for the U.S.	1978:M1 -2006:M7	Consumer sentiment index, economic news index, inflation rate, unemployment rate, personal consumption expenditures, Dow Jones Industrial Average, federal funds rate	SVAR framework along with impulse response analysis	"News shocks" play an important role in accounting for short-term variations in consumer sentiment. - Shocks to consumer sentiment also exert a small positive effect on consumer spending.
Doms and Morin (2004) for the U.S.	1978:M3 -2003:M6	Consumer sentiment index - Newspaper indexes: Recession, layoff, economic recovery - Economic variables: S&P 500, Inflation rate, unemployment rate, payroll employment, gasoline prices - Survey of professional forecasters: real *GDP* growth	Linear regression with the continuous updating model and VAR framework along with impulse response analysis	New media, such as the tone and volume of economic reporting, affect consumer sentiment. - Consumers update their expectations about the economy in periods of high news coverage of the economy during recessions and right after recessions.

such as wealth and interest rate.

Given a set of potential macroeconomic determinants of *CSI* in a vector autoregressive (VAR) model in multiple countries, Golinelli and Parigi (2004) find that the determinants are time- and country-specific. In general, an increase in stock prices makes consumers feel wealthier and can lead to an increase in their consumer sentiment, suggesting that the wealth effect plays a significant role. In the U.S., an increase in stock prices causes the wealth effect on *CSI* and acts as a leading indicator of future income growth (Otoo, 1999). In Korea, Kim and Oh (2009) find that stock returns affect the consumer sentiment, while positive news regarding *CSI* influences stock returns only for a short period.[3] In Europe, stock prices have a less of wealth effect on *CSI*, whereas the expenditure effect is greater and more dispersed, which implies that stock prices play a dominant role as a leading indicator rather than producing the wealth effect (Jansen and Nahuis, 2003).

Similar to the findings of Golinelli and Parigi (2004), the present study also finds that the determinants of *CSI* vary across countries. Nevertheless, *SHPI* and *STIR* are identified as most significant factors in all countries, except for Mexico in the case of *SHPI* and except for France, Japan, and Korea in the case of *STIR*, while *INFR* is identified as such only in France and the U.S. where its increase lowers consumer sentiment. More importantly, both contractionary economic state, proxied by a dummy variable for periods of negative *GDP* growth and a contractionary emotional state, proxied by smoothed probabilities for *CSI* in downturn periods of *GDP*, are found to be important factors in Germany and Mexico where its increase lowers consumer sentiment. These findings suggest that both economic and non-economic factors are partially responsible for the changes in *CSI*.

The remainder of this paper is organized as follows. In section 2, the variables and data used in this study are explained. Section 3 presents the

[3] Kim and Willett (2014) find that investors in Korean stock market respond more strongly to negative news than positive news in both bull and bear markets. This implies that news of economy can indirectly affect *CSI* and as a result, changes in *CSI* can influence stock returns temporarily.

empirical analysis, including prior evidence, estimation results, and the determinants of *CSI*. Section 4 concludes the paper.

2. VARIABLES AND DATA

The variables for the present study were selected based on previous empirical studies (Fuhrer, 1993; Garner, 1981; Golinelli and Parigi, 2004; Jansen and Nahuis, 2003; Lovell, 1975; Otoo, 1999). The variables include *CSI*, *GDP*, *SHPI*, *STIR*, *INFR*, and *UEMR*. In particular, the last four variables are singled out as potential forces driving consumer sentiment since they are the determinants of consumption, which is known to be highly correlated with *CSI*.

Share price index is used as a proxy variable of income (wealth), which has a positive relationship with consumption. Short-term interest rate is one of the important factors relevant to consumption. Inflation rate based on consumer price index (*CPI*) is known to have a direct relationship with consumption. Unemployment rate contains information as a lagging indicator about future economic conditions (Vuchelen, 2004). A high *UEMR* indicates that economy has performed poorly, which implies a lower future income level for consumers, presumably leading to decreases in current and future consumption.

Data regarding all these variables come from OECD's database OECD.Stat and they are compiled from ten major OECD countries: three from Europe (Germany, the U.K., and France), three from North America (the U.S., Canada, and Mexico), two from Oceania (Australia and New Zealand), and two from Asia (Japan and Korea).

The monthly data for some variables, such as *CSI*, *CPI*, and *SHPI*, are converted into quarterly data by simply averaging the three-month values in each quarter. The consumer sentiment index is calculated from the survey data related to the past, current, and future economic and financial situations. It is in general measured as a balanced score, which is the percentage of

positive responses (or increases) minus the percentage of negative responses (or decreases), plus 100.[4] However, survey questions and computing methods for *CSI* somewhat differ between European and non-European countries, resulting in different index scales.[5] Thus, to make the regression results of various countries more comparable, the standardized *CSI* of OECD is used, which is seasonally adjusted.

Likewise, the seasonally adjusted and standardized *UEMR* is used, which is defined as a percentage of the unemployed people to the civilian labor force, except in Germany. German unemployment data are only available from the first quarter of 1991, causing a reduced sample period in the empirical analysis. To extend the sample period, a seasonally adjusted *UEMR* for people aged 15 and over is used. Short-term interest rate is the money market rate per annum, i.e., the short-term borrowing rate between financial institutions, typically referred to as the call rate or the interbank rate. Inflation rate is defined as the quarterly percentage change in *CPI*

Table 2 Description of Country-Specific Samples for Estimation

Countries	Sample Period	Variables	Data Frequency
Australia	1974:Q3 - 2015:Q4	*GDP*, *CSI*, *STIR*, *SHPI*, *INFR*, *UEMR*	Quarterly
New Zealand	1988:Q3 - 2015:Q4		
Germany	1973:Q1 - 2015:Q4		
United Kingdom	1974:Q1 - 2015:Q4		
France	1973:Q1 - 2015:Q4		
United States	1970:Q1 - 2015:Q4		
Canada	1980:Q1 - 2015:Q4		
Mexico	2001:Q2 - 2015:Q4		
Japan	1982:Q3 - 2015:Q4		
Korea	1998:Q4 - 2015:Q4		

Note: The U.K.'s *STIR* starts from 1978:Q1, France's *UEMR* starts from 1983:Q1, and Japan's *GDP* and *STIR* start from 1994:Q1 and 1985:Q3, respectively.

[4] An index number above the threshold (100) indicates that the economy will improve because the number of consumers with a positive outlook on the economy outnumbers those with a negative outlook.

[5] For the method of calculating the index, refer to Bram and Ludvigson (1998) and Ludvigson (2004) for the U.S. and Golinelli and Parigi (2004) for other countries.

measured by "all items" with the OECD base year 2010 as 100. Share price index is the national share price index with the OECD base year 2010 as 100. The real *GDP* is also seasonally adjusted.

The initial sample period varies depending on the availability of data in each country, while the final period is 2015:Q4 for all countries. In some countries, sample periods for some variables are not consistent due to the limitation of data. For example, the U.K.'s *STIR* starts from 1978:Q1, France's *UEMR* starts from 1983:Q1, and Japan's *GDP* and *STIR* start from 1994:Q1 and 1985:Q3, respectively. Therefore, the sample periods for these countries are reduced whenever the variables are included in regression analysis. The description of variables and the sample periods for each country are summarized in table 2.

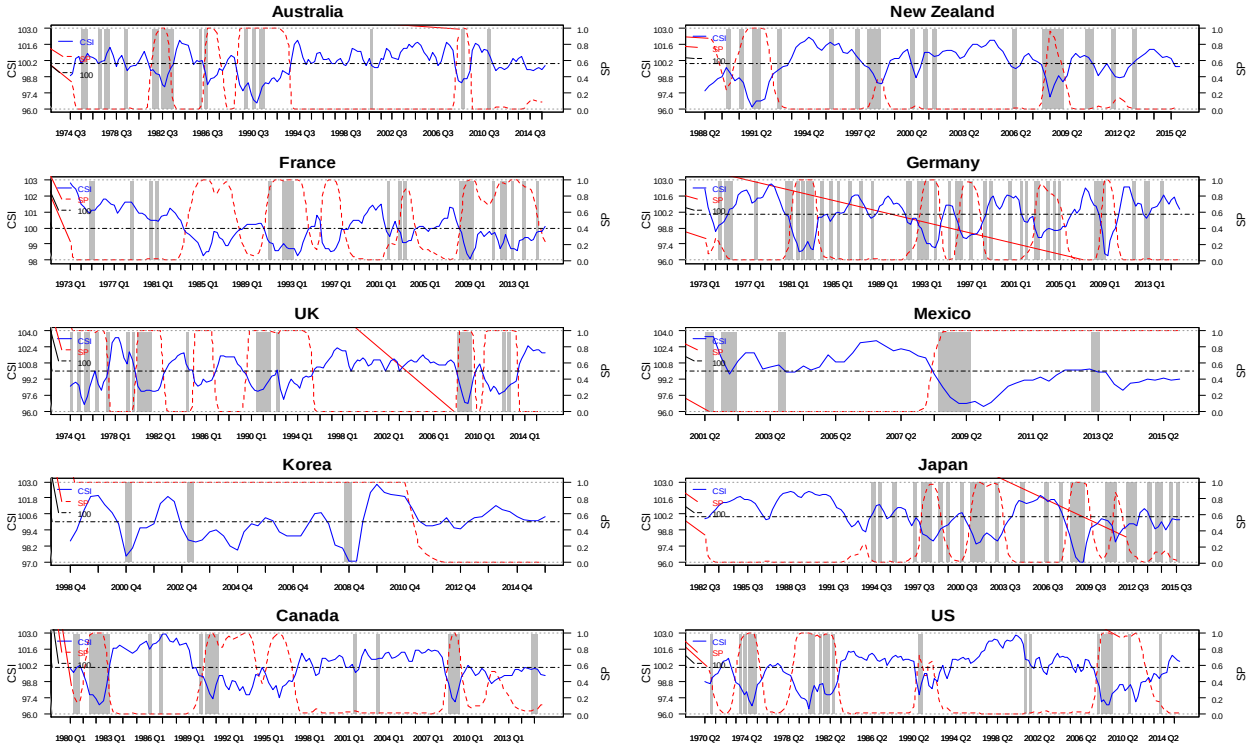
3. EMPIRICAL ANALYSIS

3.1. Prior Evidence

To observe the preliminary evidence of the causal relationship between *CSI* and *GDP*, I first have to compare the time series of *CSI* with the historical quarter-to-quarter *GDP* growth rate. The gray bars in figure 1 indicate the periods of negative growth. The figure 1 shows that in all countries, negative *GDP* growth periods coincide with most of *CSI* downturn periods. This presents evidence that there is likely to be a coincident and positive correlation between *CSI* and *GDP*. However, the relationship between *CSI* and one-quarter-lagged or -leading *GDP* growth rate, i.e., lagging or leading information of *CSI*, is not clearly identifiable in the figure.

Even when *CSI* shows a downturn trend, the economy is not necessarily in contraction if the index is above the baseline of 100 (i.e., the number of positive consumer responses is greater than the number of negative responses). To explicitly identify true contractionary periods, the smoothed probabilities (SPs) for the contractionary state are extracted from *CSI* using a

Figure 1 Consumer Sentiment Index (*CSI*) and Smoothed Probability (*SP*)



Note: Gray bars represent the periods of negative quarter-to-quarter *GDP* growth.

simple Markov switching regression model and the contraction periods are compared with the periods of negative growth.[6] Smoothed probabiliy is defined as the smoothed inference about the state at time *t* using information available regarding a future period.[7]

As shown in figure 1, SPs describe the state of contraction in most of the periods when *CSI* is below 100 and the state of expansion (i.e., non-contraction) in most of the periods when *CSI* is above 100. In most countries, negative *GDP* growth periods, in particular at least two consecutive quarters of negative *GDP* growth, coincide with the periods of SPs for a contractionary state. Similar to the previous outcomes regarding the association between *GDP* growth rate and *CSI*, this also presents evidence that there is likely to be a coincident and positive correlation between the SPs for a contractionary state and negative *GDP* growth (i.e., a positive correlation between *CSI* and *GDP*), while the lagging or leading information of *CSI* is not still apparent. These findings suggest that the current state of the economy, such as a contraction or a recession, is likely to contemporaneously affect the mood of consumers.

To further identify the causal relationship, the dynamic correlation between *CSI* and *GDP* is examined. Table 3 shows that in all countries except for Australia, New Zealand, and Japan, *CSI* at time *t* has the highest correlation with current or future *GDP* rather than past *GDP*.[8] This indicates that *CSI* presumably contains coincident or leading information for economic activity.

Lastly, the Granger-causality test is performed. Variable *X* is said to Granger-cause variable *Y* if and only if lagged variable *X* helps to predict *Y*. Table 4 displays the results of the test performed with the optimal two lags, based on the Schwarz information criterion (SIC). Consumer sentiment index

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[6] The model is specified as $CSI_t = \beta_{s_t} + u_t$ where $u_t \sim N(0, \sigma^2_{s_t})$, $s_t =$ states 1 and 2 for time *t*.

[7] For further details, refer to Hamilton (1989 and 1993).

[8] The dynamic correlation is provided for up to three quarters, within which the highest correlation appears in all countries except for Australia, which shows the highest correlation at *t*–4.

Table 3 Dynamic Correlation between *CSI* and *GDP*

Countries	CSI_t and $GDP_{t\pm i}$ for $i = 0, 1, 2, 3$						
	t–3	*t*–2	*t*–1	*t*	*t*+1	*t*+2	*t*-3
Australia	–0.234	–0.043	–0.049	0.053	0.127	0.049	0.162
New Zealand	–0.254	–0.015	0.084	0.093	0.195	0.150	0.096
Germany	–0.107	–0.084	0.139	0.337	0.256	0.156	0.158
UK	–0.137	–0.189	–0.131	0.156	0.142	0.178	0.221
France	–0.227	–0.029	0.152	0.247	0.326	0.251	0.149
US	–0.182	–0.118	–0.044	0.203	0.318	0.214	0.157
Canada	–0.216	–0.269	–0.173	0.160	0.319	0.427	0.332
Mexico	0.107	0.047	0.203	0.450	0.323	0.301	0.249
Japan	–0.386	–0.218	0.057	0.209	0.240	0.379	0.224
Korea	–0.359	–0.412	–0.016	0.477	0.433	0.275	0.148

Notes: 1) *GDP* and *CSI* are indicated in log values and the quarter-to-quarter growth rate (i.e., the difference in log values) is shown. 2) The value at *t*–3 in Australia represents the one at *t*–4.

Table 4 Granger Causality Tests of *CSI* and *GDP*

Countries	Null Hypothesis	
	CSI does not Granger-cause *GDP*	*GDP* does not Granger-cause *CSI*
Australia	0.007***	0.794
New Zealand	0.001***	0.161
Germany	0.001***	0.643
UK	0.000***	0.388
France	0.001***	0.014**
US	0.000***	0.969
Canada	0.000***	0.377
Mexico	0.401	0.289
Japan	0.017***	0.517
Korea	0.000***	0.819

Notes: 1) Based on the Schwarz information criterion for the optimal lag length test, two time-lags are used in the Granger-Causality test. 2) *P*-values are presented. 3) *, **, and *** represent the significance at the level of 10%, 5%, and 1%, respectively.

Granger-causes *GDP* in all countries, except for Mexico, which implies that *CSI* may lead *GDP*. On the contrary, *GDP* does not Granger-cause *CSI* in all countries, except for France. This does not necessarily mean that *GDP* does not truly lead *CSI*, because Granger-causality is neither a necessary nor sufficient condition for a genuine causal relationship between two variables. Thus, to identify their relationship more rigorously, regression analysis is performed in the next section.

3.2. Estimation Results

It has been well documented in literature that *CSI* is capable of predicting economic activity, i.e., it contains leading information. Nonetheless, it is also possible that there is a reverse causality between *CSI* and economic activity: current and past performances in output may influence consumers' mood. In such cases, *CSI* can possess coincident and/or lagging information of economic activity, which may provide signals about the current economic state. To find this evidence and to make the estimation results of each country comparable, ordinary least squares (OLS) regression is performed with an identical set of explanatory variables for all countries.

Before estimating the model, the augmented Dickey-Fuller unit root test is performed for all variables.[9] In all countries, most of the variables are identified as having a unit root, so *GDP* and *SHPI* are first-differenced in log value, while *STIR* and *UEMR* are only level-differenced because they are in the form of percentage. On the contrary, *INFR* is not identified as having a unit root in all countries except for France and Mexico, so *INFR* is used at level. Consumer sentiment index is also not identified as having a unit root in all countries. Survey data are known to be free from issues of trends and seasonality since they depend on consumers' subjective judgment regarding the economic condition (Santero and Westerlund, 1996). Nonetheless, *CSI* is first-differenced in log value in order to eliminate this factor if mood is

[9] The results will be presented upon request.

constant over time.[10)]

To scrutinize the association between *CSI* and *GDP*, a regression of *GDP* is performed on its own lagged variable and *CSI*, followed by a regression of *CSI* on its own lagged variable and *GDP*. The lagged dependent variable is included as an explanatory variable not only to reduce the omitted variable bias, but also to capture a "mood formation" similar to a habit formation in an economic consumption model because the current mood of consumers is likely to be influenced by the consumer sentiment in the previous period. According to Lovell (1975), a lagged variable captures the contagious disillusionment and the persistent mood of consumers.

As seen in table 4, the result of the Granger-causality test presents overall evidence on the leading features of *CSI*. Nonetheless, regression of *GDP* is performed on GDP_{t-1} and CSI_{t-1} to examine if the lagged *CSI* in each country is statistically significant on an individual basis. Table 5 shows the regression results that are very similar to the findings from the Granger-causality test, and presents the evidence on the predictive power of the *CSI* as a leading indicator for economic activity. In all countries except for Australia, the U.K., and Mexico, *CSI* exerts a lagged effect on *GDP* with a statistical significance, which implies that *CSI* contains leading information for economic activity.[11)]

Next, to observe the properties of *CSI* as a coincident and/or lagging indicator for *GDP*, regression of *CSI* is performed on CSI_{t-1}, GDP_t, and GDP_{t-1}.[12)] Table 6 shows the regression results suggesting that in Germany,

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[10)] The use of *CSI* varies in empirical studies. Matsusaka and Sbordone (1995) and Lovell and Tien (2000) use *CSI* at level since the index is a measure of the changes in consumer sentiment and is trendless. Jansen and Nahuis (2003) and Vuchelen (2004) use first-differenced *CSI* at level due to its non-stationarity and autoregressivity, respectively, while Otoo (1999) and Carroll *et al*. (1994) use the first-differenced of *CSI* in the form of logarithm.

[11)] Regression was also run using VAR (vector autoregressive) with two lags. Estimation results appear to be very similar to these ones. In all countries except for Australia, New Zealand, and UK, *CSI* has a lagged effect on *GDP*. However, in New Zealand *CSI* does not appear to be significant, while in Mexico and Japan it turns out to be significant in two lags, i.e., at *t*–2. The results are available upon request.

[12)] To be consistent with the sample period in the multivariate regression, the sample periods of the U.K., France, and Japan start with 1978:Q2, 1983:Q2, and 1994:Q2, respectively.

Table 5 Estimation Results of *GDP* on *CSI*

Countries	Variable	*GDP*(*t*–1)	*CSI*(*t*–1)	*C*	Adj-R^2
Australia	*GDP*	0.004 (0.078)	0.194 (0.119)	0.008*** (0.001)	0.004
New Zealand	*GDP*	–0.034 (0.095)	0.380** (0.183)	0.007*** (0.001)	0.021
Germany	*GDP*	0.036 (0.079)	0.391*** (0.127)	0.004*** (0.001)	0.056
UK	*GDP*	0.106 (0.078)	0.208 (0.129)	0.006*** (0.001)	0.019
France	*GDP*	0.407*** (0.068)	0.357*** (0.108)	0.003*** (0.0005)	0.255
US	*GDP*	0.265*** (0.070)	0.420*** (0.111)	0.005*** (0.001)	0.159
Canada	*GDP*	0.477*** (0.070)	0.313*** (0.091)	0.003*** (0.001)	0.316
Mexico	*GDP*	0.432*** (0.132)	0.173 (0.176)	0.003** (0.001)	0.226
Japan	*GDP*	0.121 (0.107)	0.410** (0.204)	0.002 (0.001)	0.051
Korea	*GDP*	0.185 (0.122)	0.418*** (0.148)	0.009*** (0.002)	0.201

Notes: 1) *CSI* and *GDP* are the first-differences in log value. 2) Standard errors are in parentheses. 3) Adj-R^2 represents adjusted R^2. 4) ***, **, and * represent represent p<0.01, p <0.05, and p <0.1, respectively.

the U.K., France, the U.S., Canada, Mexico, and Korea, *GDP* has a contemporaneous effect on *CSI* with a statistical significance. This presents evidence that current economic activity affects consumer sentiment, and suggests

In this regression, a potential endogeneity problem may arise with *GDP*, so the correlation between the residuals and GDP_t is checked. In all countries, correlations appear to be closed to zero. Nonetheless, asumming *GDP* to be endogenous, GMM estimation is further performed with gross fixed capital formation (*GFCF*) as an instrumental variable for *GDP*. The endogeneity test, known as the Durbin-Wu-Hausman test for *GDP* shows that there is no endogenous problem with *GDP*, and *GFCF* is not identified as a weak instrumental variable.

Table 6 Estimation Results of *CSI* on *GDP*

Countries	Variable	*CSI*(*t*–1)	*GDP*	*GDP*(*t*–1)	*C*	Adj-R^2
Australia	*CSI*	0.306*** (0.076)	0.011 (0.050)	–0.043 (0.049)	0.0003 (0.001)	0.080
		0.302*** (0.076)	0.011 (0.050)		–0.0001 (0.001)	0.081
New Zealand	*CSI*	0.328*** (0.094)	0.013 (0.049)	0.028 (0.048)	–0.0002 (0.001)	0.093
		0.333*** (0.093)	0.012 (0.049)		0.00002 (0.001)	0.098
Germany	*CSI*	0.534*** (0.065)	0.134*** (0.039)	–0.041 (0.04)	–0.0004 (0.0004)	0.370
		0.512*** (0.062)	0.133*** (0.039)		–0.001 (0.0004)	0.370
UK	*CSI*	0.441*** (0.074)	0.091** (0.041)	–0.111*** (0.042	0.0001 (0.001)	0.220
		0.405*** (0.074)	0.085** (0.042)		–0.0007 (0.001)	0.187
France	*CSI*	0.266*** (0.088)	0.134* (0.073)	0.060 (0.072)	–0.001** (0.0004)	0.158
		0.277*** (0.087)	0.164** (0.064)		–0.001* (0.0004)	0.160
US	*CSI*	0.201*** (0.076)	0.117** (0.050)	–0.091* (0.048)	–0.0001 (0.001)	0.075
		0.184** (0.076)	0.091* (0.048)		–0.001 (0.0005)	0.062
Canada	*CSI*	0.283*** (0.081)	0.190*** (0.073)	–0.268*** (0.070)	0.0004 (0.001)	0.167
		0.285*** (0.085)	0.051 (0.066)		–0.0003 (0.001)	0.085
Mexico	*CSI*	0.160 (0.137)	0.329*** (0.105)	–0.064 (0.111)	–0.002* (0.001)	0.180
		0.133 (0.127)	0.305*** (0.095)		–0.002** (0.001)	0.190
Japan	*CSI*	0.449*** (0.100)	0.067 (0.053)	–0.030 (0.052)	–0.0001 (0.001)	0.210
		0.449*** (0.095)	0.059 (0.051)		–0.0002 (0.001)	0.225
Korea	*CSI*	0.418*** (0.119)	0.346*** (0.095)	–0.300*** (0.095)	–0.0003 (0.002)	0.348
		0.273** (0.118)	0.290*** (0.100)		–0.0031** (0.001)	0.256

Notes: 1) *CSI* and *GDP* are the first-differences in log value. 2) Standard errors are in parentheses. 3) Adj-R^2 represents adjusted R^2. 4) ***, **, and * represent $p<0.01$, $p<0.05$, and $p<0.1$, respectively.

that *CSI* contains coincident information of economic activity. In order to check the robustness of the results, regression is re-run after dropping GDP_{t-1}. As shown in the next line, the outcome of estimation is very similar to previous results.[13] Moreover, in the U.K., the U.S., Canada, and Korea, lagged *GDP* also appears to be statistically significant with a negative coefficient. This suggests that in these countries, past realization of economic development contemporaneously affects the consumer sentiment by lowering it.

In addition to *GDP*, macroeconomic information regarding financial and labor markets in relation to the state of economy may also influence consumer sentiment. Thus, to control its effect and confirm the results on robustness, *SHPI*, which captures financial condition of consumers, as well as *STIR*, *UEMR*, and *INFR*, which capture information about the current and future state of economy, are added to the previous univariate regression model before regressions are re-run. As shown in Panel A of table 7, these variables can also be potential determinants of *CSI*. Thus, their robustness is checked by dropping *GDP* in Panel B of table 7.

The estimation results in Panel A of table 7 show that, as in the univariate model in table 6, the current *GDP* growth rates of Germany, France, and Mexico are still statistically significant. Accordingly, the *GDP* growths in these countries are very likely to have an contemporaneous effect on *CSI*. Unlike in the univariate model, the current *GDP* growths in the U.K., the U.S., Canada, and Korea do not appear to be statistically significant. Thus, the effect of *GDP* on *CSI* is ambiguous in these countries and their *CSI*s should be cautiously regarded as coincident indicators. These findings confirm that in some countries, *CSI* contains coincident information and suggest that it can be useful as a mood signal for assessing the changes in economic activity.

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[13] In Canada, the significance of *GDP* disappears. Regression results only with GDP_{t-1} are also consistent with the previous ones except that in the U.S. and France. They will be available upon request.

Table 7 Estimation Results of *CSI* on *GDP* and Control Variables and Determinants of *CSI*

Countries	Australia	New Zealand	Germany	UK	France	US	Canada	Mexico	Japan	Korea
Variables	Panel A: *CSI*									
CSI(*t*–1)	0.288*** (0.073)	0.234*** (0.089)	0.458*** (0.059)	0.392*** (0.070)	0.221*** (0.083)	0.147** (0.067)	0.226*** (0.08)	0.116 (0.131)	0.335*** (0.095)	0.212* (0.107)
GDP	0.025 (0.051)	–0.007 (0.047)	0.127*** (0.038)	0.040 (0.044)	0.137** (0.069)	0.018 (0.055)	0.077 (0.075)	0.237* (0.120)	0.034 (0.048)	0.114 (0.114)
SHPI	2.074*** (0.515)	3.922*** (0.860)	2.226*** (0.393)	2.770*** (0.675)	1.447*** (0.322)	3.437*** (0.527)	3.125*** (0.624)	0.470 (1.117)	2.556*** (0.613)	4.386*** (0.912)
STIR	–0.111** (0.044)	–0.186*** (0.068)	–0.130** (0.051)	–0.115*** (0.037)	0.026 (0.039)	0.059** (0.027)	–0.068** (0.032)	–0.225 (0.166)	–0.022 (0.351)	–0.296 (0.248)
INFR	–0.015 (0.038)	–0.048 (0.092)	–0.038 (0.057)	–0.045 (0.037)	–0.179*** (0.055)	–0.130*** (0.038)	–0.087 (0.057)	–0.175 (0.131)	0.004 (0.092)	–0.037 (0.157)
UEMR	0.062 (0.146)	–0.088 (0.142)	–0.080 (0.146)	0.049 (0.161)	0.042 (0.143)	0.100 (0.133)	0.225 (0.157)	–0.445 (0.457)	0.768** (0.323)	0.081 (0.315)
Constant	–0.0004 (0.001)	0.00003 (0.001)	–0.001 (0.001)	–0.0004 (0.001)	0.0001 (0.0005)	0.001 (0.001)	–0.0003 (0.001)	–0.0004 (0.002)	–0.0001 (0.0005)	–0.002 (0.002)
Adj-R^2	0.191	0.257	0.483	0.313	0.282	0.282	0.261	0.213	0.370	0.454

Variables	Panel B: *CSI*									
CSI(*t*–1)	0.290*** (0.073)	0.233*** (0.088)	0.483*** (0.061)	0.391*** (0.070)	0.264*** (0.081)	0.151** (0.066)	0.238*** (0.079)	0.174 (0.131)	0.397*** (0.083)	0.247** (0.102)
SHPI	2.085*** (0.514)	3.926*** (0.855)	2.441*** (0.399)	2.952*** (0.642)	1.574*** (0.320)	3.485*** (0.505)	3.209*** (0.619)	1.483 (1.020)	1.862*** (0.458)	4.838*** (0.791)
STIR	–0.111** (0.044)	–0.186*** (0.068)	–0.085* (0.05)	–0.117*** (0.037)	0.034 (0.04)	0.059** (0.027)	–0.065** (0.032)	–0.189 (0.170)	0.100 (0.098)	–0.219 (0.235)
INFR	–0.016 (0.038)	–0.045 (0.089)	–0.042 (0.058)	–0.051 (0.036)	–0.162*** (0.055)	–0.129*** (0.038)	–0.087 (0.057)	–0.197 (0.135)	0.011 (0.066)	–0.002 (0.153)
UEMR	0.037 (0.136)	–0.083 (0.138)	–0.171 (0.147)	–0.004 (0.150)	–0.084 (0.13)	0.075 (0.107)	0.137 (0.130)	–0.853** (0.420)	0.617** (0.286)	–0.023 (0.297)
Constant	–0.0002 (0.001)	–0.00003 (0.001)	–0.0001 (0.0005)	–0.0001 (0.001)	0.0006 (0.0004)	0.001 (0.001)	0.0002 (0.001)	0.001 (0.002)	–0.0001 (0.0004)	–0.0009 (0.001)
Adj-R^2	0.195	0.264	0.452	0.314	0.265	0.285	0.261	0.168	0.324	0.454

Notes: 1) *CSI* and *GDP* are the first-differences in log value. 2) *SHPI*, *STIR*, *INFR* and *UEMR* are divided by 100. 3) Standard errors are in parentheses. 4) Adj-R^2 represents adjusted R^2. 5) ***, **, and * represent $p<0.01$, $p<0.05$, and $p<0.1$, respectively.

3.3. Determinants of *CSI*

3.3.1. Economic factors

The control variables in Panel A of table 7 can also be regarded as potential determinants of *CSI* in the countries. Thus, we shall examine which factors are important in determining consumer sentiment. One conspicuous result is that *SHPI* exerts a significant and positive effect on *CSI* in all countries except for Mexico. This implies that increased income due to the wealth effect is a highly relevant factor in establishing consumer sentiment. In this case, it is likely that Mexico's stock market is less developed, compared to those of the other countries and therefore, consumer sentiment may be not influenced by the changes in share prices.

According to conventional wisdom, a rise in *STIR* has both negative and positive effects on consumption. On a negative side, it increases interest rate payments on consumers' short-term debts, having an adverse impact on their cash flow. On a positive side, their interest incomes increase. In general, the negative effect is known to be greater than the positive effect. Thus, an increase in interest rate can lead to reduced overall consumption and subsequently a decline in consumer sentiment. In all countries except for France, Mexico, Japan, and Korea, *STIR* is statistically significant with a negative coefficient. This implies that the increase of consumers' debt burdens by rising interest rate can lower their sentiment. However, its sign in the U.S. appears to be positive. It is likely that the positive impact of higher interest rates outweighs the negative impact in the U.S., resulting in a positive effect on *CSI*.

In France and the U.S., *INFR* is statistically significant at level of 1%. The result of the U.S. is consistent with the finding of Garner (1981). Aggregate household consumption accounts for about 70% of *GDP* in the U.S., which is the highest among all sampled countries and it has a high correlation with consumer sentiment. Therefore, consumer sentiment appears to be very sensitive to *INFR*. Moreover, unemployment rate turns out to have a positive relationship with *CSI* only in Japan with a statistical

significance. These results suggest that in most of countries macroeconomic variables such as *INFR* and *UEMR* are not significant factors that affect consumer sentiment.

To examine the robustness of these *CSI* determinants, regression is re-run after dropping *GDP* and only with potential determinants. Panel B of table 7 shows that the estimates are very consistent with previous results: *SHPI* is statistically significant in all countries except for Mexico; *STIR* is still significant in Australia, New Zealand, Germany, the U.K., the U.S., and Canada; and *INFR* is not statistically significant in all countries except for France and the U.S.[14)]

In a nutshell, the determinants of *CSI* vary across countries. Nevertheless, there are some common features: *SHPI* and *STIR* are most likely to be significant factors of *CSI* in most countries, whereas *INFR* and *UEMR* may not be. This implies that wealth effects via share price and interest rate can play a significant role in forming consumers' sentiment. Overall, previous outcomes are found to be quite robust.

3.3.2. Non-Economic factors

It has been previously found that *SHPI* and *STIR* are the major driving economic forces of *CSI*. Nevertheless, non-economic factors such as psychological sentiment may also play such a role. For example, when an economy is in a downturn, consumers are more likely to be in a depressed mood and their responses to a sentiment survey would be negative, causing the *CSI* to fall. To capture this emotional effect, a dummy variable is generated, which is assigned a value of 1 for quarters of negative *GDP* growth, and 0 otherwise. In addition, Okun's economic misery index, which indicates the overall level of economic uncomfortability in a country, is generated by simply summing *INFR* and *UEMR*.

Regressions are run by adding the dummy variable (*NGWR*) and the misery

[14)] There is one difference among the results of unemployment rate: the unemployment rate in Mexico appears to be statistically significant. This marginal difference does not significantly affect the overall outcomes.

Table 8 Estimation Results of Economic and Psychological States' Effect on *CSI*

Countries	Australia	New Zealand	Germany	UK	France	US	Canada	Mexico	Japan	Korea
Variables	Panel A: *CSI*									
CSI(*t*–1)	0.292*** (0.071)	0.239*** (0.085)	0.489*** (0.058)	0.401*** (0.07)	0.343*** (0.082)	0.186*** (0.070)	0.212*** (0.08)	0.134 (0.133)	0.343*** (0.083)	0.245** (0.096)
SHPI	1.972*** (0.516)	3.887*** (0.849)	2.266*** (0.401)	2.854*** (0.668)	1.313*** (0.334)	3.574*** (0.535)	2.839*** (0.621)	0.776 (1.053)	1.807*** (0.462)	4.680*** (0.920)
STIR	–0.119*** (0.041)	–0.179*** (0.066)	–0.103** (0.049)	–0.123*** (0.036)	0.038 (0.040)	0.056** (0.026)	–0.073** (0.032)	–0.292* (0.167)	0.075 (0.100)	–0.240 (0.233)
MI	0.017 (0.021)	0.022 (0.026)	0.006 (0.014)	–0.005 (0.017)	0.009 (0.022)	0.012 (0.020)	0.031 (0.023)	–0.002 (0.085)	0.074* (0.043)	–0.0004 (0.097)
NGWR	–0.088 (0.122)	–0.104 (0.122)	–0.182** (0.076)	–0.072 (0.119)	0.084 (0.085)	0.182 (0.116)	–0.058 (0.131)	–0.874*** (0.289)	–0.076 (0.095)	–0.177 (0.464)
Constant	–0.002 (0.002)	–0.0016 (0.002)	–0.0003 (0.001)	–0.0001 (0.001)	–0.001 (0.002)	–0.002 (0.001)	–0.003 (0.002)	0.0002 (0.005)	–0.0028* (0.002)	–0.0008 (0.004)
Adj-R^2	0.199	0.269	0.462	0.306	0.214	0.253	0.255	0.193	0.315	0.455

Variables	Panel B: *CSI*									
CSI(*t*–1)	0.297*** (0.071)	0.258*** (0.089)	0.473*** (0.058)	0.415*** (0.07)	0.345*** (0.081)	0.200*** (0.069)	0.224*** (0.081)	0.227* (0.122)	0.321*** (0.086)	0.245** (0.096)
SHPI	2.043*** (0.520)	4.059*** (0.854)	2.216*** (0.396)	2.945*** (0.667)	1.320*** (0.334)	3.714*** (0.535)	2.949*** (0.637)	2.026** (0.983)	1.736*** (0.468)	4.680*** (0.920)
STIR	–0.108** (0.042)	–0.175*** (0.066)	–0.113** (0.048)	–0.118*** (0.036)	0.038 (0.040)	0.060** (0.026)	–0.068** (0.032)	–0.270* (0.161)	0.074 (0.099)	–0.240 (0.233)
MI	0.013 (0.021)	0.019 (0.026)	0.013 (0.014)	–0.008 (0.017)	0.009 (0.022)	0.003 (0.021)	0.027 (0.024)	–0.072 (0.085)	0.078* (0.042)	–0.0004 (0.097)
PSI	0.102 (0.180)	0.094 (0.251)	–0.419*** (0.129)	0.0498 (0.128)	0.111 (0.096)	0.314** (0.134)	0.0571 (0.182)	–1.360*** (0.400)	–0.178 (0.154)	–0.177 (0.464)
Constant	–0.002 (0.002)	–0.002 (0.002)	–0.001 (0.001)	–0.00003 (0.001)	–0.001 (0.002)	–0.001 (0.002)	–0.003 (0.002)	0.003 (0.005)	–0.003* (0.002)	–0.001 (0.004)
Adj-R^2	0.198	0.265	0.477	0.305	0.216	0.265	0.255	0.224	0.319	0.455

Notes: 1) *CSI* and *GDP* are the first-differences in log value. *SHPI*, *STIR*, *MI*, *NGWR*, and *PSI* are divided by 100. 2) Standard errors are in parentheses. 3) Adj-R^2 represents adjusted R^2. 4) *NGWR* and *MI* represent a dummy variable for quarters of negative *GDP* growth and a misery index, respectively. 5) *PSI* represents an ad-hoc variable for the psychological indicator. 6) ***, **, and * represent $p<0.01$, $p<0.05$, and $p<0.1$, respectively.

index (*MI*) to the previous regression equation in Panel B of table 7 instead of dropping *INFR* and *UEMR*. Regression results in Panel A of table 8 show that the negative *GDP* growth dummy variable (*NGWR*) is statistically significant in Germany and Mexico. This suggests that an economic state reflecting the contraction of economy exerts a negative effect on consumer sentiment.

Next, to delve deeper into this contractionary state effect, the *SP*s previously extracted from *CSI* are used as a proxy variable for a psychological indicator. As seen in figure 1, *SP*s indicate the likelihood that *CSI* falls into a contractionary state at any given period *t*. Thus, it is assumed that the probability reflects consumers' emotional state about the economic condition for each period; the higher the probability, the worse the consumer mood is likely to be. To further extract the information reflecting consumers' gloomy mood only in downturn periods, *SP*s are multiplied by the dummy variable explained above. This new indicator is used as an ad-hoc variable for measuring consumer sentiment during an economic contraction.

Regressions are re-run by replacing the negative *GDP* growth dummy variable (*NGWR*) with an ad-hoc variable for a contractionary state (*PSI*) in order to identify the emotional effect on the *CSI* and to check the robustness of the previous results. Panel B of table 8 shows the results of a regression performed with the pseudo psychological indicator (*PSI*). Similar to the results estimated for *NGWR* in Panel A, estimations of *PSI* have negative effects on *CSI* with statistical significances in Germany and Mexico.[15] This presents evidence that consumers' gloomy mood in an economic recession can aggravate their sentiment, i.e., non-economic factors such as psychological state can affect *CSI*. Furthermore, in both Panels A and B, *SHPI* is still statistically significant in all countries except for Mexico, as are *STIR* in Australia, New Zealand, Germany, the U.K., the U.S., Canada, and

[15] In the U.S., the estimated coefficient of *PSI* appears to be positive with a statistical significance. The current contractionary state may cause the U.S. consumers to expect the economy to improve in the near future, so *PSI* seems to have a positive effect on *CSI*.

Mexico. The misery index is not estimated to be statistically significant except for in Japan in both Panels A and B. This is not surprising because in most of the countries, *INFR* and *UEMR* are not found to be significant economic determinants of *CSI*, as shown in table 7.

In sum, although there are some variations of *CSI* determinants across the countries, consumer sentiment can be driven by both economic forces such as wealth effects and by non-economic forces such as emotional effects.

4. CONCLUSION

A number of previous studies have primarily focused on the role of information and the effectiveness of consumer sentiment as sources of aggregate economnic movements; consumers anticipate changes in the state of economy, so variation in *CSI* as a leading indicator precedes changes in the overall economy. In this case, the leading information is useful for predicting the changes that are likely to occur in the economy.

On the contrary, consumers may also react to changes in the state of economy; an improvement in economic activity is likely to lead a rise in consumer sentiment. That is, it is possible that there is a reverse causality between *CSI* and economic activity. If so, *CSI* can also be a coincident or lagging indicator that follows the changes in economic activity. In this case, the coincident or lagging information is more useful as a mood signal for assessing the changes in the economy. Based on the data from ten OECD countries, this paper explored the causal relationship between *CSI* and *GDP*, and found some evidence that *CSI* contains not only leading information but also coincident information in Germany, France, the U.S., Canada, and Korea. This implies that *CSI*, generally known as a leading indicator also contains a coincident information. This gives an important policy implication that it should be cautiously interpreted when it changes because it could be both a sign of the future changes in economic activity and a mood signal for the contemporaneous changes in economic activity.

When people feel wealthier they tend to increase their spending and their sentiment is more likely to be elevated. On the other hand, when the economy as a whole declines, consumers feel worse and their sentiment about the economy tends to decline. These economic and non-economic forces can influence consumer sentiment. Thus, this paper also examined whether consumer confidence can be explained by non-economic factors such as state of the economy and psychological state, as well as standard economic determinants such as income and interest rate.

It was found that in most of the countries, *SHPI* and *STIR* reflect the changes in *CSI* very well, which implies that wealth and financial effects play an important role on consumer sentiment. Moreover, consumer sentiment depends on their judgment and expectations about the economy. That is, consumers seem to be sensitive to both economic and psychological states. Therefore, *CSI* is also likely to be driven by non-economic factors, such as emotional responses to economic realizations or uncertainty. In a regression analysis of economic determinants, a contractionary state indicator, defined as a dummy variable for the quarters of negative *GDP* growth, and an ad-hoc psychological indicator, defined as the probabilities of the contractionary state of *CSI* for economic downturn, were found to have a negative and significant effect on *CSI* in Germany and Mexico, which suggests that non-economic factors also play an important role on consumer sentiment.

In conclusion, *CSI* is identified as a leading and/or coincident indicators of economic activity. Both economic factors such as wealth and interest rate and non-economic factors such as economic and psychological states are identified as driving forces of consumer sentiment.

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