

WHAT LIES BENEATH IN CONSUMER CONFIDENCE: EXPECTATIONS OR CURRENT PERCEPTIONS?

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Abstract: *Consumer confidence index of many countries have been widely studied because of its direct link with aggregate consumption expenditures. Nevertheless, these studies lack in distinguishing backward-looking and forward-looking questions of the survey. Indeed, the decomposition of the main index is important to test whether the expectations or the current perceptions drive the consumer sentiment. In this paper we investigate the Granger causality in time dimension between the backward-looking and forward-looking sub-indices of consumer confidence for the emerging market of Turkey over 2002:1-2011:4. Moreover, we use the frequency domain analysis to examine the differences between time domain and frequency domain causality techniques depending on Breitung and Candelon (2006). As far as our knowledge, this is the first paper that examines the relationship between the “current situation” and “expectations” sub-indices for consumer surveys. Our results show that before 2008 the direction of the causality goes from forward-looking sub-index (FWI) to backward-looking sub-index (BWI) whereas after crisis the direction is totally reversed. After 2008, BWI Granger causes FWI over all frequencies. After crisis the people rationally update their future expectations based on backward-looking questions. Additionally, over low frequencies there is no statistically significant causality between FWI and BWI before crisis. The percentage of variance of BWI (FWI) explained by FWI (BWI) is very low, but increasing with higher frequencies. Lastly, the comovement between FWI and BWI is relatively higher after the crisis even though the level of comovement is still very high.*

Keywords: *Consumer sentiment, Consumer Confidence Index, Granger causality, EGARCH*

JEL Codes: *C23, D12, E33*

1. INTRODUCTION

Considering the latest changes in the world, identification of indicators leading/lagging basic macroeconomic variables plays an important role to observe the cycles in the economy. With this aim, apart from several indirect indicators, consumer surveys directly measure the response of economic agents.

Consumer confidence indices or consumer surveys have been widely used to forecast the consumer spending in many countries due to its direct linkage with consumption

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expenditures. Even though some studies, such as Mishkin (1978) and Bram and Ludvigson (1998) suggest that consumer confidence improve forecasts of consumer spending, other studies such as Lovell (1975) and Croushore (2005), indicates that the improvement in forecasting is insignificant or in some cases indices lead to a decrease in forecast performance.

In addition to the consumption expenditures, consumer surveys have been used to forecast other macroeconomic variables, especially growth, unemployment and inflation. To illustrate; Leeper (1992) find that consumer confidence index has an explanatory power to explain the changes in industrial production and unemployment, but the explanatory power disappears when real stock prices and interest rates are incorporated to the analysis. Indeed, another study by Lemmon and Portniaguina (2006) shows that sentiment component of the confidence index (Consumer Confidence Indices of The University of Michigan and the Conference Board) can be used to forecast returns on stocks primarily held by individuals over 1956-2002.

Apart from forecasting purposes, the content of consumer surveys can be decomposed to separate forward-looking questions and current-conditions or backward-looking questions. To illustrate; even though the Michigan Index of Consumer Sentiment (ICS) is derived from five core questions, the Index of Consumer Expectations (ICE) is developed from three forward-looking questions of ICS. ICE is included in the Leading Indicator Composite Index developed by the US Department of Commerce. Lovell (2001) suggests that ICE shows better performance to forecast consumption growth of the US. Another study by Kwan and Cotsomitis (2004) also supports the view that ICE is incrementally more informative about the US household spending than ICS over 1960-2002. Basdas (2011) analyzes the relationship between the Joint Harmonised EU Programme of Business Surveys and economic growth over 1985-2009. In this study, the survey questions are decomposed based on their content in order to compute current conditions and expectations sub-indices. ARDL and Panel ARDL model results indicate that there is not a significant difference between two sub-indices.

Some studies analyze questions of surveys separately instead of a sub-index. For example; Kwan (2005) distinguishes QFPE (Financial Position Expectation), QII (Investment Intention), QOC (Operating Capacity) and QECE (Economic Conditions Expectation) questions within the QSBC (Quarterly Survey of Business Confidence) prepared by the Conference Board of Canada. The results indicate that QII and QECE can track future path of GDP and industrial production, but especially QECE can predict those variables three quarters ahead.

Previous studies show that these tests lack in distinguishing backward-looking and forward-looking questions of the survey. Indeed, the decomposition of the main index is important to test whether the expectations or the current perceptions drive the consumer sentiment. In this paper we investigate the Granger causality in time dimension between the backward-looking and forward-looking sub-indices of consumer confidence for the emerging market of Turkey over 2002:1-2011:4. Moreover, we use the frequency domain analysis to examine the differences between time domain and frequency domain causality

techniques depending on Breitung and Candelon (2006). As far as our knowledge, this is the first paper that examines the relationship between the “current situation” and “expectations” sub-indices for consumer surveys. Our results show that before 2008 the direction of the causality goes from forward-looking sub-index (FWI) to backward-looking sub-index (BWI) whereas after crisis the direction is totally reversed. After 2008, BWI Granger causes FWI over all frequencies. After crisis the people rationally update their future expectations based on backward-looking questions. Additionally, over low frequencies there is no statistically significant causality between FWI and BWI before crisis. The percentage of variance of BWI (FWI) explained by FWI (BWI) is very low, but increasing with higher frequencies. Lastly, the comovement between FWI and BWI is relatively higher after the crisis even though the level of comovement is still very high.

This paper contributes to the existing literature in three ways. First, this paper decomposes the consumer index based on its content and investigates the link between these sub-indices rather than forecasting purposes. Therefore, this paper emphasizes the investigation of sub-indices as well as the indices itself. Second, this is one of the studies prepared on emerging markets: Turkey. As far as our knowledge, this is the first attempt to decompose the consumer index of Turkey. Third, our methodology reveals the fact that the causality tests can be sensitive to dimensions forcing researchers to include various methods at the same time.

The paper is organized as follows: Part 2 presents the data used, and then Part 3 describes the methodology. Part 4 discusses the empirical results and Part 5 concludes.

2. DATA

Our data includes monthly CNBC-e CCI of Turkey in order to test the relationship between backward- and forward-looking questions over 2002:1-2011:4. CCI is obtained from the CNBC-e/NTVMSNBC website. CCI has been published by CNBC-e since January 2002 which is the base month with a value of 100. In order to calculate the CCI, around 700 monthly telephone surveys of households are used. The methodology used to compile and to calculate the index has been adopted from the Michigan University index of consumer sentiment. This index includes five questions:

1. We would like to learn your current economic situation. Can you compare your (and your family's) current financial situation with last year?
2. What do you think your (and your family's) future financial situation will be in a year?
3. Can you compare your current expectations about Turkish economy with the previous month?
4. What do you think Turkish economy's situation will be in a year?
5. Do you think that the current period is a good time to buy durable consumer goods such as TV, refrigerator and furniture or vehicles or residence?

For the first four questions, four answer choices are available: Better, Worse, Same or No Idea. For the fifth question the answer choices are Good Time, Bad Time or No

Idea. Then, the index is calculated by subtracting the number of optimistic answers from the number of pessimistic responses, adding 100 and using the Laspeyres methodology to reach the current period's value.

Considering the structure of the questions, Question 1, 3 and 5 measure the current perception of consumers whereas Question 2 and 4 examine the future expectations of consumers. Therefore, backward-looking sub-index is calculated as the average of Question 1, 3 and 5 (Q135). Similarly, forward-looking sub-index is calculated as the average of Question 2 and 4 (Q24). Then, the causality relationship between Q135 and Q24 is investigated over before crisis (before 2008) and after crisis (after 2008) periods by the causality tests in the frequency domain and comovement analysis.

3. METHODOLOGY

3.1 Causality Tests in Frequency Domain

The Granger causality tests indicate whether the past changes in x (y) have an impact on current changes in y (x) over a specified time period. Nevertheless, these test results can provide results on causality over all frequencies. On the other hand, Geweke's linear measure of feedback from one variable to another at a given frequency can provide detailed information about feedback relationships between growth and consumer confidence over different frequency bands. Even though frequency decompositions are generally investigated for neurophysiologic studies, it is important to address how the causality changes with frequency. This measure would enable us to quantify what fraction of total power at frequency ω of growth (consumer confidence index) is attributed to consumer confidence index (growth). Besides, studies such as Yildirim and Taştan (2009) show that the significance and/or direction of the Granger causality can change after adopting the causality test in frequency domain.

By using a Fourier transformation to VAR (p) model for x and y series, the Geweke's measure of linear feedback from y to x at frequency ω is defined as :

$$M_{y \rightarrow x}(\omega) = \log \left[\frac{2\pi f_x(\omega)}{|\Psi_{11}(e^{-i\omega})|^2} \right] = \log \left| 1 + \frac{|\Psi_{12}(e^{-i\omega})|^2}{|\Psi_{11}(e^{-i\omega})|^2} \right| \quad (i)$$

If $|\Psi_{12}(e^{-i\omega})|^2 = 0$, then the Geweke's measure will be zero, then y will not Granger cause x at frequency ω . Breitung and Candelon (2006) present this test by reformulating the relationship between x and y in VAR equation:

$$x_t = \alpha_1 x_{t-1} + \dots + \alpha_p x_{t-p} + \beta_1 y_{t-1} + \dots + \beta_p y_{t-p} + \varepsilon_{1t} \quad (ii)$$

The null hypothesis tested by Geweke, $M_{y \rightarrow x}(\omega) = 0$, corresponds to the null hypothesis of:

$$H_0 : R(\omega) \beta = 0 \tag{iii}$$

where β is the vector of the coefficients of y , and:

$$R(\omega) = \begin{bmatrix} \cos(\omega) \cos(2\omega) \dots \cos(p\omega) \\ \sin(\omega) \sin(2\omega) \dots \sin(p\omega) \end{bmatrix} \tag{iv}$$

Breitung and Candelon (2006) simplify the Geweke’s null hypothesis so that a usual F-statistics can be used to test causality in frequency domain. Therefore, this study uses Breitung and Candelon (2006) version of Geweke (1982).

3.2 Comovement Analysis

We use wavelet comovement analysis in frequency domain developed by Rua (2010). This technique is seemingly superior to all the other comovement analysis as shown by Rua (2010). The importance of this technique lies in the fact that it brings together the time dimension analysis and frequency dimension. Hence, comovement is observed through wavelets which form in frequency over a specified time interval. The only setback is there is not a test which measures the significances of the correlation coefficient in the analysis. Hence, we assume that any coefficient over 0.75 denotes statistical significance.

4. EMPIRICAL RESULTS

The causality test in frequency domain enables to observe the causality over different frequencies instead of a constant test statistics in the time domain. In order to compare the results in the time domain with the frequency domain analysis both test results are provided.

According to the time domain Granger causality results it is found that Q24 Granger causes Q135 at 10% significance level over all time period (2002-2011). On the other hand, Q135 does not Granger cause Q24 meaning that only forward-looking sub-index Granger causes backward-looking sub-index. However, only over after crisis period (2008-2011) the direction of relationship reverse whereas before crisis period supports same direction of relationship as found for overall period. In general, it is expected to find that current perceptions would enhance the future expectations of consumers referring that BWI would Granger cause FWI. Nevertheless, this rational linkage is only supported for after crisis period. Besides, the test statistics for all period yields an average value not confirmed with two sub-periods.

Considering the frequency domain test results in Table 1, Q24 (FWI) Granger causes Q135 (BWI) only over high frequencies. On the other hand, the test statistics for the other direction is insignificant for all frequencies. Before 2008, the direction of the causality is same (i.e., from FWI to BWI) whereas after crisis the direction is totally reversed. After 2008, BWI Granger causes FWI over all frequencies, as expected.

The comparison of the time and frequency domain analysis reveals the fact that before 2008 only over high frequencies there was causality from FWI to BWI. This can

be explained by the fact that before crisis the customers were forming their future and backward perception together and their conceptions about future are so dominant that the causality goes from FWI to BWI. However, after crisis the people rationally update their future expectations based on backward-looking questions. Additionally, frequency domain analysis underlines another important result: over low frequencies there is no statistically significant causality between FWI and BWI over 2002-2011 and over 2002-2008. Only after crisis the causality is significant over both low and high frequencies. This implies that for low frequency data only after the crisis there is a significant causality from BWI to FWI.

Apart from the causality tests, frequency domain analysis enables to examine the percentage of variance of one variable explained by another variable over different frequencies. In Table 4, percentage of variance of FWI explained by BWI is graphed. Even though this percentage varies over time, over higher frequencies the percentage rises. Still, the variance of forward-looking questions explained by backward-looking questions is low, even lower than 1%. Similarly, in Table 5 the percentage of variance of BWI explained by FWI is very low and rising with the higher frequencies.

Lastly, the relationship between backward- and forward-looking questions is analyzed with the comovement statistics developed by Rua (2010). In the following figures the horizontal axis denotes time where the vertical axis refers the frequency. Therefore, the comovement analysis shows not only the comovement between two selected series, but

Table 1: Granger Causality in Frequency Domain, 2002-2011

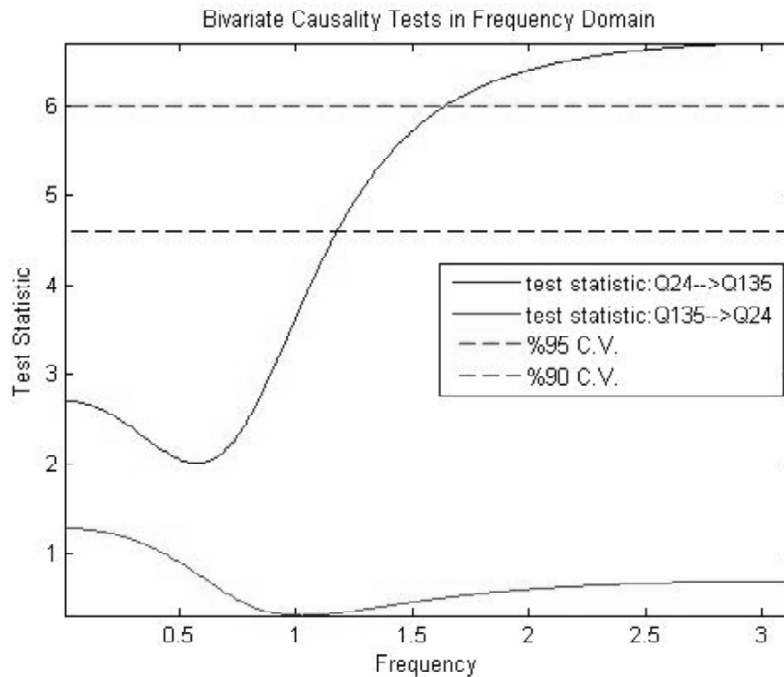


Table 2: Granger Causality in Frequency Domain, Before Crisis

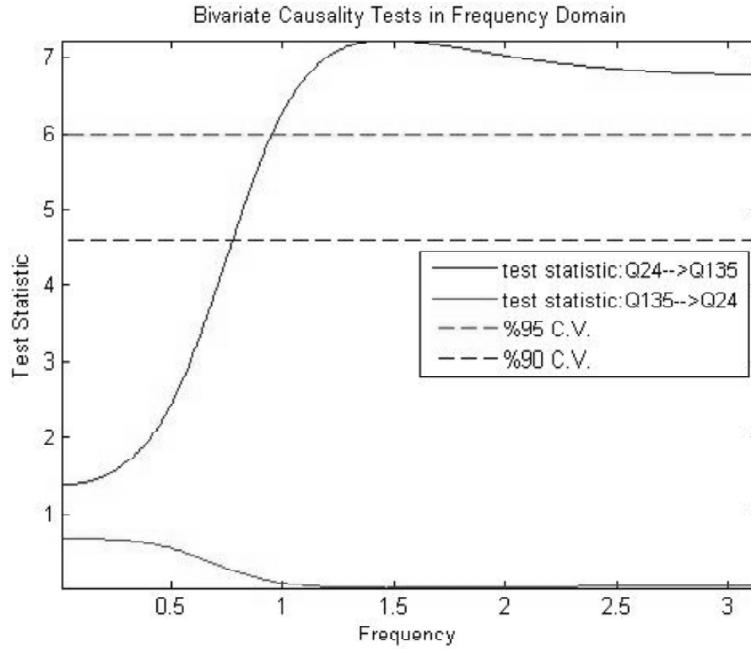


Table 3: Granger Causality in Frequency Domain, After Crisis

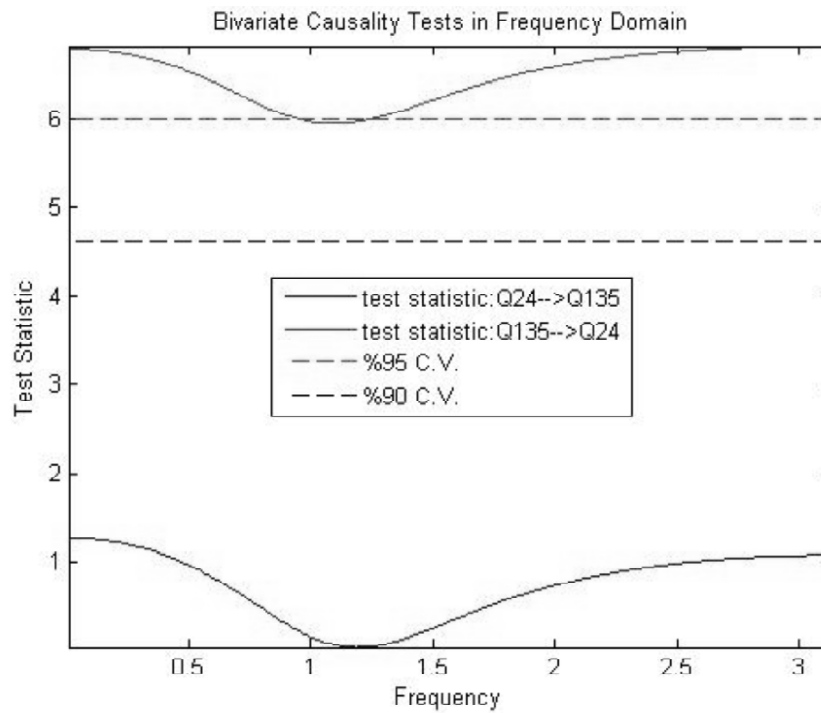


Table 4: The Percentage of Variance of FWI Explained by BWI

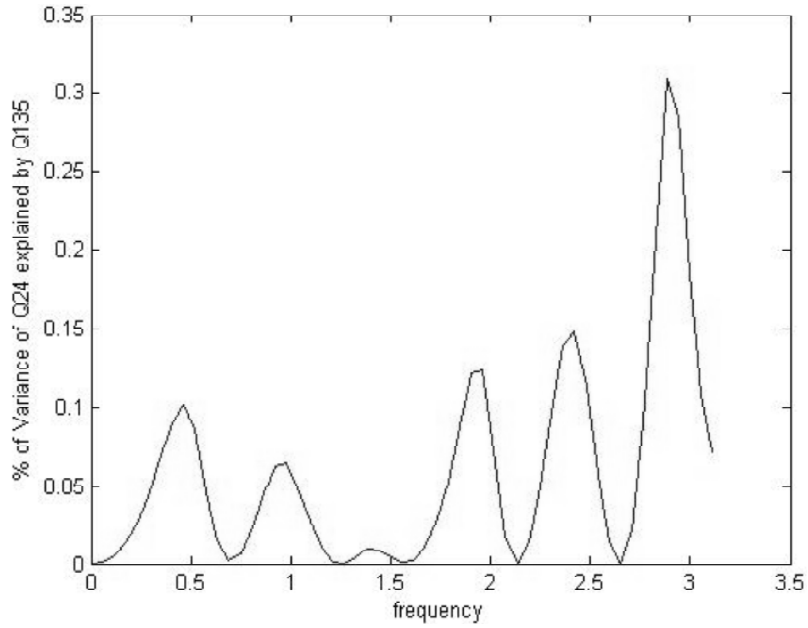
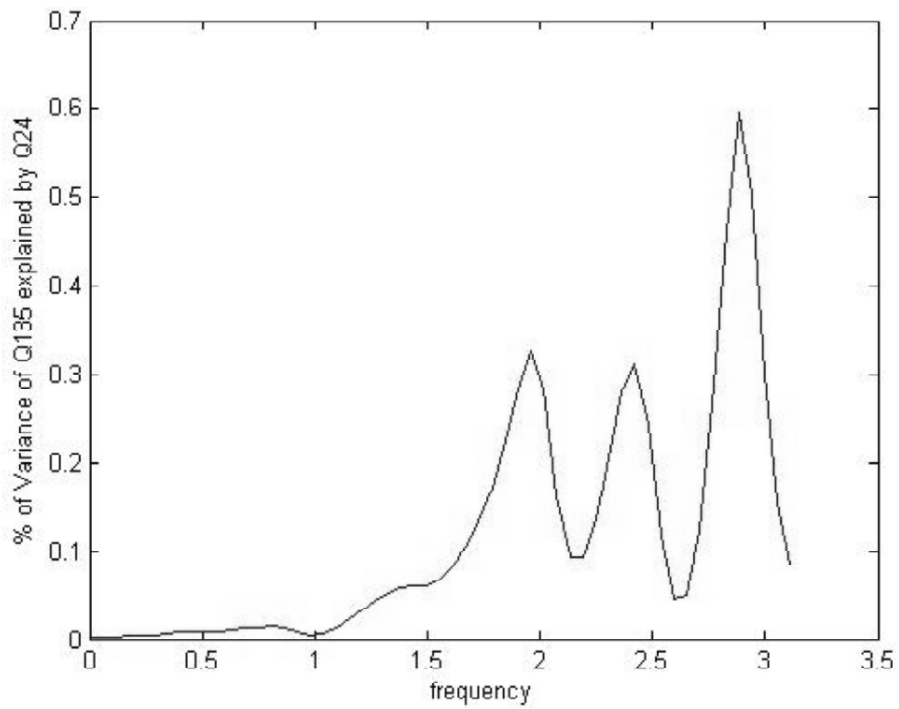


Table 5: The Percentage of Variance of BWI Explained by FWI



also the change of comovement both over time and different frequencies. As the color in figures turns from blue to red, the level of comovement between series increases.

According to Figure 1, there is a high comovement between these two series. Only in 2005 the comovement between BWI and FWI gets comparatively weaker, but still higher than 0.4. In Figure 2 and 3 the periods before and after the crises are focused. Weaker comovement around 2005 can be easily seen in Figure 2. As shown in Figure 3, the comovement is relatively higher after the crisis even though the level of comovement is still very high.

The comovement analysis also supports the findings of causality tests indicating that these series are connected in a way that one can cause the other.

Figure 1: The Comovement between BWI and FWI, 2002-2011

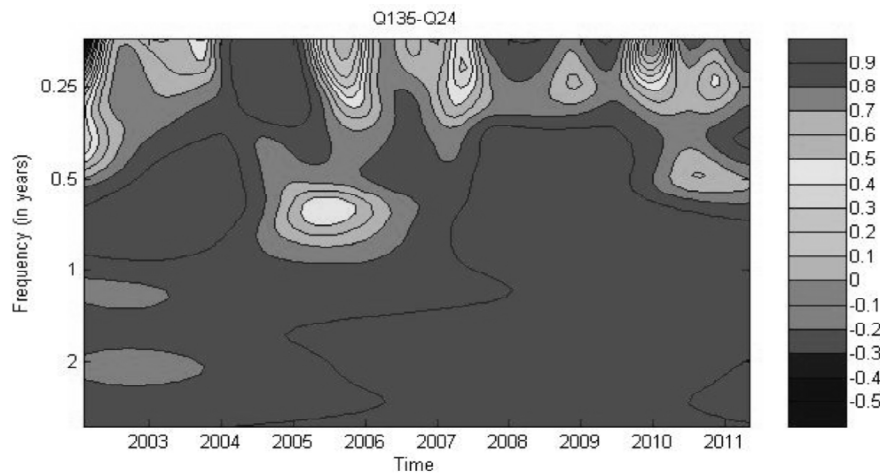


Figure 2: The Comovement between BWI and FWI, Before Crisis

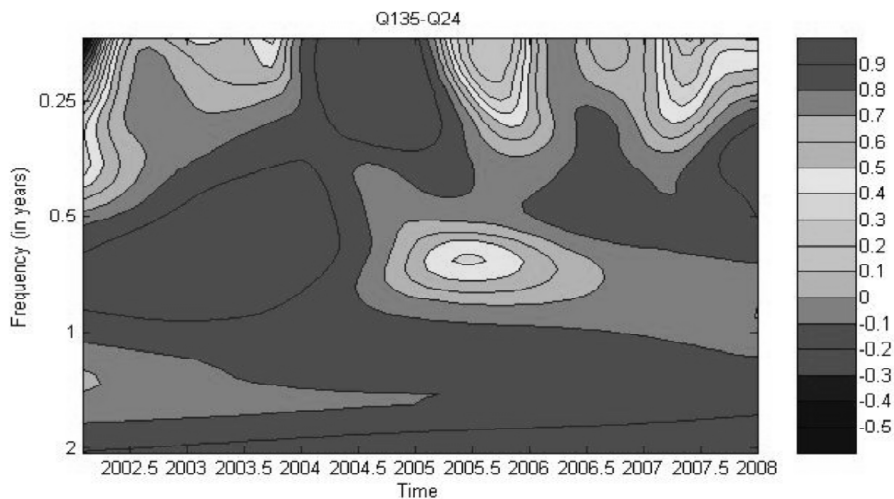
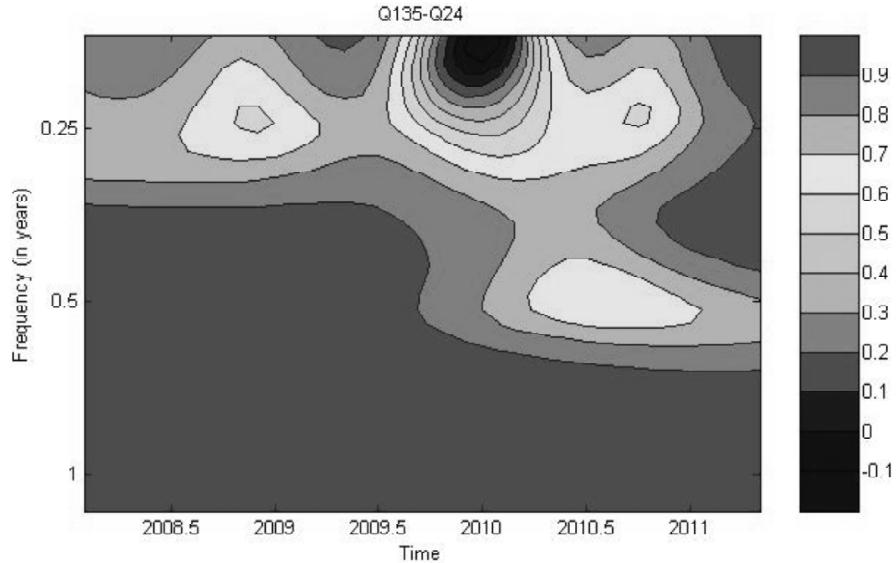


Figure 3: The Comovement between BWI and FWI, After Crisis

5. CONCLUSION

Especially after the latest financial crisis, creation of indicators to signal disorders in the market has gained attention. In this respect, consumer confidence indices or consumer surveys have been widely used to compute leading indicators and to forecast the consumer spending in many countries due to its direct linkage with consumption expenditures. However, these studies concentrate on the linkages rather than the content of the surveys.

In this paper, we aim to investigate the Granger causality in time dimension between the backward-looking and forward-looking sub-indices of consumer confidence for the emerging market of Turkey over 2002:1-2011:4. Moreover, we use the frequency domain analysis to examine the differences between time domain and frequency domain causality techniques depending on Breitung and Candelon (2006). As far as our knowledge, this is the first paper that examines the relationship between the “current situation” and “expectations” sub-indices for consumer surveys.

Our results show that before 2008 the direction of the causality goes from forward-looking sub-index (FWI) to backward-looking sub-index (BWI) whereas after crisis the direction is totally reversed. After 2008, BWI Granger causes FWI over all frequencies. The comparison of the time and frequency domain analysis reveals the fact that before 2008 only over high frequencies there was causality from FWI to BWI, but there is no statistically significant causality between FWI and BWI before crisis. This can be explained by the fact that before crisis the customers were forming their future and backward perception together and their conceptions about future are so dominant that the causality goes from FWI to BWI. However, after crisis the people rationally update their future expectations based on backward-looking questions. Additionally, frequency domain

analysis underlines another important result: over low frequencies there is no statistically significant causality between FWI and BWI over 2002-2011 and over 2002-2008. Only after crisis the causality is significant over both low and high frequencies. This implies that for low frequency data only after the crisis there is a significant causality from BWI to FWI. Therefore, only time domain analysis is unable to outline the real linkages.

In addition to the causality tests, the percentage of variance of BWI (FWI) explained by FWI (BWI) is very low, but increasing with higher frequencies. Lastly, the comovement between FWI and BWI is relatively higher after the crisis even though the level of comovement is still very high.

For future research, the relationship between sub-indices and macroeconomic variables can be investigated by both time and frequency domain analysis. In line with these researches, forecasting performance of sub-indices as well as the main indices can be compared with a longer dataset.

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