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# The Relationship Between Sectoral Employment and Real Sector Economic Confidence: Fourier Causation Analysis

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**ABSTRACT**

**Purpose –** In order to ensure economic growth in the short term and economic development in the long term, it is important to evaluate the events occurring in the political and economic order correctly and to meet the expectations. This study was created to evaluate the effectiveness of economic confidence on the relevant sectors on a sectoral basis

**Design/Methodology/Approach –** In this study, the relationship between the real sector economic confidence index and employment rates in industry, construction and services sectors will be analyzed. Turkey is selected as the sample and the data range subject to the analysis is determined as 2009:01-2023:08. In the study, the Fourier analysis method, which is among the new generation analysis methods, was applied, and Fractional Frequency Fourier Augmented Dickey Fuller Unit Root Test and Fourier Toda-Yamamoto Causality Test were applied.

**Findings –** As a result of the application, a one-way causality relationship from the real sector economic confidence index to building and industry sector employment was determined. A recommendation should be made regarding the necessity of making political arrangements that will maintain the stability level of employment in the relevant sector.

**Discussion –** In line with the data obtained in this study, the fact that real economic confidence has an effect on employment in the construction and industrial sectors, in addition to the fact that sectoral employment has no effect on the real economic confidence index, can be linked to the fact that sectoral leaders pursue a policy of contraction or expansion within the framework of expectations.

## 1. Introduction

Economic confidence is defined in the literature as the level of stability in economic variables and the reaction of citizens to the economy, taking into account political, social and economic factors (Ahmed et al., 2021). Economic confidence is determined according to whether macroeconomic variables such as unemployment rates, inflation rates, employment level, consumer and producer price indices, increases and decreases in national income, foreign trade deficit and surplus, increases and decreases in foreign trade volume meet expectations. If such economic variables are at levels that meet expectations, then the citizens of that country will act in a climate of confidence in planning their spending, investment and savings. The economic predictability expressed here will show a driving force at the point of development of the economy. Economic confidence is basically analysed in two separate groups. These should be expressed as the confidence of consumers in the economy and the confidence of producers. While the economic confidence of consumers is determined as a result of the expectations of citizens, also referred to as the real sector, regarding economic variables such as unemployment, inflation, foreign trade figures, national income, etc., the economic confidence of producers is determined by taking into account the fulfilment of expectations regarding the sector in which the producer is involved.

Accordingly, real sector economic confidence is expressed as an output based on forecasts determined by sector representatives and is statistically shared with the public. In addition to being an output of predictions regarding the economy, the real sector economic confidence index affects and is affected by more than one variable. The variables that this index, which is a real sector economic confidence index, is most frequently

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examined in the literature are macroeconomic variables, and more than one study in the field examines the causality relationship between variables (Akkaya, 2023; Arısoy, 2012; Canöz, 2017; Durgun, 2019). The index expressing the economic confidence of the real sector has been formed by the Turkish Statistical Institute and the Central Bank as of 2005 and the index is formed by analysing the results of the questionnaire directed to the representatives of the real sector and presenting quantitative output. Among these factors that determine real sector economic confidence, questions are asked about production in the relevant sector, order status, inventory tracking information, inflation rates, employment level, financial values, etc., and the answers obtained are analysed and real sector economic confidence is reached. (*İktisadi Yönelim İstatistikleri ve Reel Kesim Güven Endeksi*, 2024) . Therefore, it can be assessed that the real sector economic confidence index provides a comprehensive economic outlook.

The fact that the real sector economic confidence index is an important issue for both policy makers and academics is explained by the fact that the calculated index provides output on important macroeconomic factors and the index is among the topics examined in macroeconomic studies. When the literature of economics discipline is analysed, more than one study (Korkmaz & Çevik, 2009; Arısoy, 2012; Canöz, 2017; Usul, et al. 2017; Albayrak, 2018; Durgun, 2019; Aacar & Ketenci, 2022; Akkaya, 2023; Yıldız, 2023) has been found to examine the real sector economic confidence index.

It is seen that traditional analysis methods are frequently used in the analyses for the real sector economic confidence variable, whose relationship with multiple variables such as composite leading indicators index, capacity utilisation rate of manufacturing industry, private sector loans, M1 money supply, Borsa Istanbul (BIST) trading volume, CBRT official reserve position, total domestic credit volume, consumer confidence index, unemployment, employment, inflation, BISt-100 index, industrial production index, exchange rate, exports, imports, interest rates, stock market, etc., and there is a need for studies in which new analysis methods are applied.

When the studies on the real sector economic confidence index, whose relationship with more than one variable is examined in the literature, it is seen that traditional analysis methods are frequently used in these studies. The fact that the reliability of traditional analyses is lower than the new generation analysis methods due to the margin of error in the analysis outputs has made it necessary to conduct a study in the field with the new generation analysis method. In this direction, the application of the new generation Fourier analysis method in this study will contribute to the literature in terms of increasing the reliability of the outputs obtained.

The tests to be used in the study can be expressed as the Fourier Augmented Dickey Fuller root test and the Fourier Granger causality test, which minimizes the margin of error by measuring the causality relationship between non-linear series.

In the analysis, data on the variables presented in Chart 1-2 are analysed by taking into account the 2009:01 and 2023:08 periods in the Turkey sample.

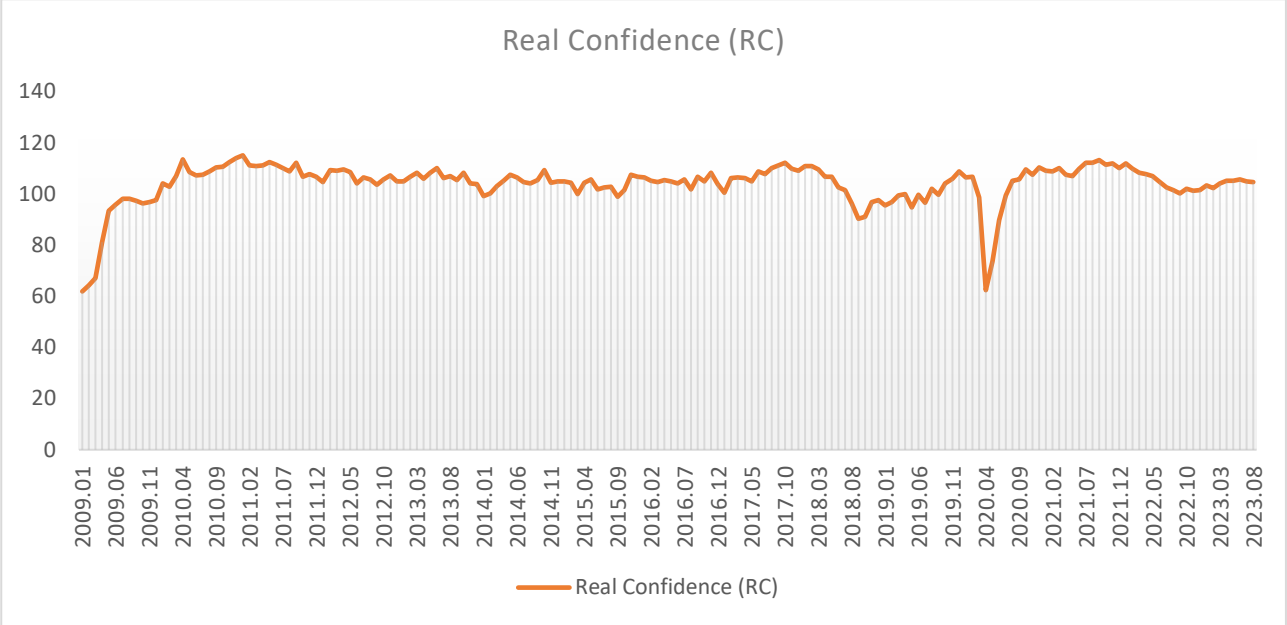


**Chart 1.** Variable development in the real sector confidence variable between 2009:01 and 2023:08

When the chart is examined, it is observed that the values of real sector economic confidence from January 2009 to August 2023. The real sector confidence index, measured at 61.9 in January 2009, mostly showed similar rates and existed in the economy with small increases and decreases. When the chart is examined, the index, which was observed at approximately 106 levels in January and February 2019, started to decrease in March with 98.6 and reached its bottom in April, falling to 62.3.

The observed decline should be evaluated in the direction of the negative impact of sectoral decline on economic confidence, and when the report prepared by the Turkish Statistical Institute for the relevant period is analysed, it can be stated that the decline in services, retail, trade, construction and manufacturing industry sectors is the reason for the decline in real sector confidence (TURKSTAT, 2020).

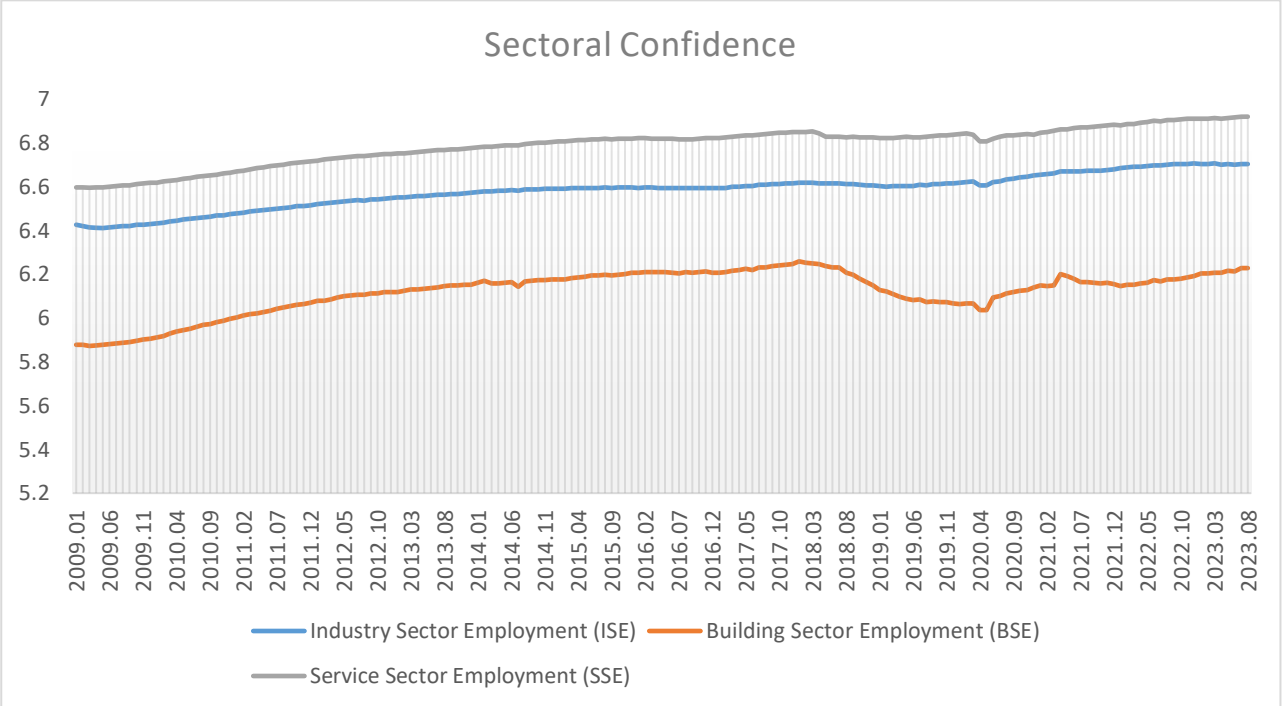


**Chart 2.** Variable development in the Industry, Building and Service Sector Employment variable between 2009:01 and 2023:08

When the chart is examined, increases and decreases can be observed in the relevant year range for all sectors subject to examination, and it is observed that there is a similar slope for the industry and service sectors and

that there is a small decrease for both sectors in April 2020, but no significant difference can be mentioned. When an analysis is made for the building sector, it can be stated that it entered a downward trend as of 2018 and settled at the lowest point in April 2020 and subsequently increased.

Although a general conclusion can be made about the variables expressed in the charts, a clear output regarding the relationship between the variables will be presented in line with the findings in the fourth part of the study.

## 2. Literature Review

Economic confidence index has been examined in more than one study in the literature. The majority of these studies evaluate economic confidence through consumer confidence and examine the relationship between macroeconomic variables and economic confidence. Borisov and Chu (2007) examined the relationship between economic confidence and economic growth, Hanke (2008) examined the relationship between income level and economic confidence, and Nadenichek (2007) examined the effect of economic confidence level and economic recession variables on each other.

These studies have been referenced more frequently in the literature because they are based on consumer trust. The real sector economic confidence index, on the other hand, evaluates on the basis of sectoral confidence and finds a more barren study area and the number of studies in the field is observed less frequently.

The real sector confidence index is examined in more than one study in the literature, and it is mostly aimed to determine the relationship between it and macroeconomic variables by using quantitative analysis methods. Durgun's (2019) study is among these studies. In the study, Turkey was selected as the sample and the period from the beginning of 2010 to the end of 2018 was analysed by taking into account the real sector confidence index and consumer confidence index variables. In the study, the relationship between certain macro variables and the stated indices was evaluated. Accordingly, the variables to be analysed in this study are Consumer Confidence Index, Consumer Price Index, exchange rate, BIST-100 Index and Real Sector Confidence Index, benchmark interest rate and employment rate. VAR analysis was applied during the analysis and it was concluded that there is a bidirectional causality relationship between the variables. Another study that conducted a study using the var analysis method and examined the relationship between macroeconomic variables and consumer confidence was written by Arısoy (2012) and covers monthly data between 2005 and 2012. The study, which is analysed in the Turkish sample, is also written by using VAR analysis method. The indices analysed in the study are consumer confidence index, real sector confidence index and macroeconomic variables as employment, stock market and consumption expenditures. When the relationship between the related indices and variables is evaluated, it is concluded that there is a relationship between indices and macroeconomic variables.

Another study applying var analysis (Akkaya, 2023) analysed the real sector economic confidence in Turkey between the beginning of 2007 and the end of 2021. Among the variables whose relationship with the index is analysed are unemployment rate, current account deficit, imports, industrial production index, domestic debt stock and a total of 30 different variables are included in the evaluation. As a result of the study, it was concluded that there are 5 variables affecting the real sector economic confidence index.

In another study, the variables between January 2007 and March 2017 were taken into consideration. In this study, cointegration and causality tests were applied in Turkey. Although there are a total of 21 variables evaluated in the study, it was concluded that there is a unidirectional causality relationship between the composite leading indicators index, capacity utilisation rate of manufacturing industry, Turkish lira reference interest rate and BIST 100 return index towards the real sector economic confidence index. In addition, unidirectional causality is found from real sector economic confidence index to capacity utilisation rate of manufacturing industry, import, export, domestic debt stock, trade balance and banking sector-domestic credit volume. (Canöz, 2017).

Albayrak (2018), applied Augmented Dickey Fuller unit root test, Cointegration test and Granger Causality test, which are among the quantitative analysis methods. In the study, it was determined that there was a one-way relationship between the variables in the relationship between the manufacturing industry sector and real confidence for the years 2007-2017 for Turkey. The variable analysed in the study is determined as the manufacturing industry capacity utilisation rate in addition to the real sector confidence index.

Financial development is observed in the literature as another variable whose relationship with the real sector economic confidence variable is measured. In his study, Yıldız (2023) examined the relationship between variables using the ARDL bounds test and Toda-Yamamoto causality tests, and as a result of evaluating the data obtained from Turkey from October 2007 to December 2022, it was concluded that there is a relationship between the variables. In this study, the variables whose relationship with the real sector economic confidence index is analysed are total assets of the banking sector, total 3-month deposits of banks, private sector loans, M1 money supply, Borsa Istanbul (BIST) trading volume, CBRT official reserve position, total domestic credit volume and foreign direct investments. These variables are taken into account in order to determine financial development.

Usul, et al. (2017) is another study that analyses the relationship between the real sector confidence index and variables and evaluates the sample of Turkey between January 2007 and January 2017. In this study, it is aimed to evaluate the effect of the real sector economic confidence index on the BIST-100, not on macroeconomic variables. Co-integration tests were used in the study and it was concluded that there is a relationship.

In their study, (Aacar & Ketenci, 2022) examined the relationship between variables using monthly data between 2014 and 2021. In the study, unit root test and Granger causality test were applied. In the study in which Turkey is selected as the sample, it is stated that negative expectations and the decline in the confidence index have a negative effect on unemployment and hence there is a one-way causality.

Korkmaz & Çevik (2009) examined the relationship between the IMKB-100 index and real sector confidence in their study. For Turkey, the data between 1987 December and 2008 October are analysed. In the study where the causality relationship between variables was examined, a contribution was made to the literature by presenting the conclusion that bidirectional causality exists.

In another study, Salihoğlu (2023) analysed the real sector economic confidence index on the banking sector. The study examined the sample of Turkey and made an evaluation between January 2013 and June 2022. In the study where the letter of credit transaction volume variable of the asset size of the banking sector was analysed, the ARDL method was used and it was concluded that there was a relationship between the variables and the effect was positive.

International studies that contribute to the literature and analyse the relationship between confidence index and macroeconomic variables are also among the reference sources within the scope of the subject. Although the variable analysed in these studies is the consumer confidence index, the contribution of these studies to the literature makes it necessary to examine these studies in the literature review.

A review of the literature reveals that there is more than one study that suggests that there is a relationship between the consumer confidence index variable and macroeconomic variables. Among these studies are Fisher & Statman (2002); Christ & Bremmer (2003); Afshar (2007); Hsu (2011); Chen (2011); Ayuningtyas & Koesrindartoto (2014); Sum (2014), which examine the relationship between stock returns and consumer confidence. Among these studies, Sum's (2014) study analysed the real absolute economic confidence index, which is also examined in this study, in addition to stock returns. As a result of the study, it was concluded that the consumer confidence index has an effect on the real sector economic confidence.

It was determined that the studies examined in the literature review section made evaluations using quantitative analysis methods, and it was observed that the quantitative tests applied in the study used traditional analysis methods. Augmented Dickey Fuller unit root test, Granger and Toda Yamamoto causality tests can be given as examples of traditional analysis methods used.

In addition to this, in this study, the Fourier analysis method, which is among the new generation analysis methods, is applied, and these tests can be expressed as "Fractional Frequency Fourier Augmented Dickey Fuller Unit Root Test" and "Fourier Toda Yamamoto Causality Test". The fact that these tests take into account sine and cosine values increases the reliability of the outputs.

## 3. Data Set and Method

In this study, econometric analysis method, which is frequently preferred in economic researches to provide quantitative outputs by examining the relationship between variables, was applied. Unit root tests, which investigate the connection between two variables and are commonly employed in macroeconomic research,

are among the most trustworthy econometric analytic methods. The most commonly used unit root test in the literature is the Augmented Dickey Fuller (ADF) unit root test, and the relevant unit root test will be used in this study. This test was introduced to the literature in 1979 with the study written by Dickey and Fuller and was developed in 1981 and reached the form used today (Dickey & Fuller, 1979,1981). Although the Fourier ADF test is the version of the applied method that analyses by taking structural breaks into account, the Fractional Frequency Fourier Augmented Dickey Fuller Unit Root Test version was obtained by re-improving the test formula. The Augmented Dickey Fuller test version to be applied in this study will be provided by the Fourier method, which minimizes the margin of error by including sine and cosine values in the analysis and is among the new generation analysis methods (Enders & Lee, 2012).

The Fractional Frequency Fourier ADF test formulation to be applied in the study and the ADF and Fourier ADF test formulations used to obtain the relevant formula are given in Table 1.

**Table 1.** Equations to be Applied in the Study

| ***Method*** | ***Equation*** |
|---|---|
| ADF | $\gamma_t = \alpha + p\gamma_{t-1} + e_t$ |
| Fourier ADF | $\Delta yt = c_0 + c_1 \sin\left(\frac{2\pi kt}{T}\right) + c_2 \cos\left(\frac{2\pi kt}{T}\right) + c_3 y_{t-1} + \sum_{i=1}^{p} a_i \Delta y_{t-i} + e_t$ |
| Fractional Frequency Fourier ADF | $y_t^* = \alpha_0 1_t^* + \beta_0 t_t^* + \lambda_1 \sin_{1,t}^* + \lambda_2 \cos_{1,t}^* + u_t, \;\; t = 1,2,3,\ldots,T$ |

When the literature is examined, it is observed that the Granger causality test, introduced by Granger (1969), is the most frequently used test. When the studies applying the relevant test are examined, it is observed that this test is used when the series of the variables under examination are stationary at level, but the reliability level of the outputs obtained in non-stationary series is low.

For this reason, the Toda-Yamamato causality test, which was introduced to the literature by Toda & Yamamoto (1995) with its structure that minimizes the margin of error, has started to be applied in examining non-stationary series. This test has filled a large gap in the literature in that it performs analysis without considering the stationarity of the series, and it is deemed necessary to determine their stationarity by taking the logarithm of the series before applying the test (Medetoğlu & Doğru, 2022).

The analysis to be carried out with the test analyzes whether there is causality between the variables examined and, if so, in which direction a causality relationship can be mentioned, just like in the study of Granger (1969). The analysis will be carried out after more than one preliminary test, and before applying this test in the study, the unit root test must be applied and the appropriate lag length, wald. Stat. value, Asymptotic Probability value needs to be determined.

Accordingly, the model to be used in the study is shown with formulations (1) and (2). This test includes a formulation based on the VAR analysis method (Gazel, 2017).

$$Y_t = \omega + \sum_{i=1}^{k} \alpha_{1i} x_{t-i} + \sum_{i=1}^{k} \beta_{1i} Y_{t-i} + \sum_{j=k+1}^{d_{max}} \delta_{1i} x_{t-i} + \sum_{j=k+1}^{d_{max}} \theta_{1i} Y_{t-i} + \varepsilon_{1t} \quad (1)$$

$$X_t = \varphi + \sum_{i=1}^{k} \alpha_{2i} x_{t-i} + \sum_{i=1}^{k} \beta_{2i} Y_{t-i} + \sum_{j=k+1}^{d_{max}} \delta_{2i} x_{t-i} + \sum_{j=k+1}^{d_{max}} \theta_{2i} Y_{t-i} + \varepsilon_{2t} \quad (2)$$

If the relevant formulas applied in the study are applied to the series, two outputs are presented for the H0 and H1 hypotheses. Accepting H0 in these outputs indicates that there is no causality relationship from the dependent variable (y) to the independent variable (x), while accepting the H1 hypothesis results in the existence of a causality relationship from the dependent variable (y) to the independent variable (x).

## 4. Findings

In this section of the study, the results of the Fourier Augmented Dickey Fuller unit root test, which is applied to determine the stationarity level of the series, and the Toda-Yamamoto causality test, which aims to

determine the causality relationship between the variables and is effective in examining non-linear series, are expressed and interpreted.

**Table 2.** Descriptive Statistics

| | Real Confidence (RC) | Industry Sector Employment (ISE) | Building Sector Employment (BSE) | Service Sector Employment (SSE) |
|---|---|---|---|---|
| **Mean** | 104,0068 | 6,789319 | 6,121729 | 6,581826 |
| **Median** | 105,65 | 6,819081 | 6,150559 | 6,595194 |
| **Maximum** | 115,1 | 6,920449 | 6,259281 | 6,707253 |
| **Minimum** | 61,9 | 6,595737 | 5,872654 | 6,412521 |
| **Std. Dev.** | 8,331219 | 0,085685 | 0,099043 | 0,077842 |
| **Skewness** | -2,95679 | -0,78562 | -1,05237 | -0,50202 |
| **Kurtosis** | 14,21685 | 2,772253 | 3,275849 | 2,673206 |
| **Jarque-Bera** | 1179,113 | 18,48502 | 33,04433 | 8,175913 |
| **Probability** | 0 | 0,000097 | 0 | 0,016773 |
| **Sum** | 18305,2 | 1194,92 | 1077,424 | 1158,401 |
| **Sum Sq. Dev.** | 12146,61 | 1,284827 | 1,716656 | 1,0604 |
| **Observations** | 176 | 176 | 176 | 176 |

The values observed in Table 2 are called descriptive statistics and provide information about the 2009:01-2023:08 period series of the variables to be examined in the study. When the table is examined, the answer to the question of which variables will be examined in the study and with which abbreviation these variables are expressed can be found. Descriptive statistics provide information about the analysed series. When the statistics are analysed, it is determined that the real sector economic confidence index is between 61.9 and 115.1 in the year range examined. The probability value of the variable, in which 176 observations are analysed, is 0, which is also stated among the outputs observed in the table. Looking at the values of the variables whose relationship with the real sector economic index is analysed, it is observed that the values of the variables for industrial sector employment are between 6.595737 and 6.920449, the construction sector employment series is between 5.872654 and 6.259281, and finally the service sector employment is between 6.412521 and 6.707253. In addition, all variable series analysed are lower than the constraint value.

When the table below is examined, it is determined that in addition to the values of the main variables of the study, logarithmic values for the building sector and the service sector are also included in the table. This detected situation can be explained by the fact that the stationarity levels of both series are not stationary at the same level, and the logarithm of the series was taken to ensure that they were stationary at the same level. It seems necessary to ensure the same level of stationarity in order to use the Toda-Yamamoto causality test in the study.

**Table 3.** Fractional Frequency Fourier Augmented Dickey Fuller Unit Root Test Results

| Variables | Real Confidence (RC) | Industry Sector Employment (ISE) | Log. Industry Sector Employment (LISE) | Building Sector Employment (BSE) | Log. Building Sector Employment (LBSE) | Service Sector Employment (SSE) | Log. Service Sector Employment (LSSE) |
|---|---|---|---|---|---|---|---|
| **Trend and Intercept Model** | | | | | | | |
| **k** | 2,8 | 1,6 | 1,6 | 4,7 | 1,1 | 0,8 | 1,3 |
| **Min. KKT** | 2701,551 | 0,001287 | 0,001185 | 0,01302 | 0,013135 | 0,002063 | 0,002027 |
| **F Test Statistics** | 4,673032 | 6,521968 | 6,898061 | 2,610676 | 2,29776 | 8,046185 | 5,82126 |
| **Appropriate Delay** | 2 | 2 | 1 | 4 | 3 | 2 | 1 |
| **Test Statistics Value** | -7,22763 | -2,02012 | -8,60708 | -2,40534 | -4,49074 | -3,34543 | -9,80313 |

When Table 3 is analysed, it is observed that the sector with the longest lag length on sectoral basis is the construction sector, while the sector with the fastest response can be interpreted as the industrial sector. In addition, it can be stated among the outputs that all variables in the table are significant at 1% level. After taking the logarithms of the relevant series, the determination that the series are non-stationary shows that the Toda-Yamamoto test, which aims to show the causality relationship between the variables, should be applied.

**Table 4.** Fourier Toda Yamamoto Test (Causality from Employment to Real Sector Economic Confidence)

| | Wald Stat. | Asymptotic Probability Value | Frequency | Delay Length | Conclusion |
|---|---|---|---|---|---|
| **LSSE – RC** | 11,568 | 0,072 | 3 | 6 | LSSE–RC |
| **LBSE – RC** | 4,593 | 0,970 | 3 | 12 | LBSE–RC |
| **LISE – RC** | 2,360 | 0,670 | 3 | 4 | LISE–RC |

When Table 4 is examined, it is observed that Fourier Toda Yamamoto results are expressed regarding the existence of a causality relationship from the logarithmic values of sectoral employment data to real confidence the achieved outputs will be interpreted taking into account the "asymptotic probability value". While the relevant values are greater than the constraint value 0.05, it shows that there is no causality relationship, while values less than 0.05 prove the existence of a causality relationship between the variables.

In this regard, no causality has been detected from the employment in the service sector (LSSE) value to real confidence, and it can be commented that the relevant causality relationship does not exist for employment in the building sector (LBSE) and employment in the industrial sector (LISE).

**Table 5.** Fourier Toda Yamamoto Test (Causality from Real Sector Economic Confidence to Employment)

| | Wald Stat. | Asymptotic Probability Value | Frequency | Delay Length | Conclusion |
|---|---|---|---|---|---|
| **RC– LSSE** | 7,854 | 0,249 | 3 | 6 | RC–LSSE |
| **RC - LBSE** | 35,885 | 0 | 3 | 12 | RC→LBSE |
| **RC - LISE** | 25,936 | 0 | 3 | 4 | RC→LISE |

Table 5 evaluates the existence of a causality relationship from real sector confidence to sectoral employment level, and for the service sector, a causality relationship from real sector confidence to service sector employment has not been detected. In addition, it has been determined that there is a causality relationship from real sector confidence to construction sector and industrial sector employment.

In this regard, when Tables 4 and 5 are evaluated together, taking into account the Toda-Yamamoto test results, it can be commented that only real sector confidence is the unidirectional cause of service sector and industrial sector employment. In this regard, it can be interpreted that when the confidence of the real sector increases, unemployment in the relevant sectors will decrease, increased employment will increase the efficiency and quantity of production and subsequently have a positive effect on economic growth.

## 5. Conclusion

The level of development of a country's economy is determined by the value shown by the macroeconomic variables of that country. Inflation rates, unemployment rates, interest rates, foreign trade figures, exchange rates, GDP, GNP, GNP, etc., which are expressed among macroeconomic variables. increases and decreases observed in variables provide information on the development of that country's economy. As a matter of fact, if the increases and decreases in these and similar macro variables meet the expectations, it increases the confidence in the economy and if not, it decreases it. The index analysed in this study, which is the variable expressing the confidence in the economy, is called the real sector economic index. The real sector economic confidence index is an index that is evaluated by taking into account the answers given to the questions asked in the survey directed to the sectors operating in that country and presents a quantitative output. When the real sector economic confidence index is analysed, more than one item such as production, order status, inventory tracking information, inflation rates, employment level and financial values can be shown among the determinants of this index. When the variables whose relationship with the real sector economic index is

examined in the literature, it is observed that more than one variable such as Consumer Confidence Index, Consumer Price Index, exchange rate, BIST-100 Index and Real Sector Confidence Index, benchmark interest rate, employment rate, employment, stock market, consumption expenditures, composite leading indicators index, capacity utilisation rate of manufacturing industry etc. have been examined in the literature.

However, when the literature is examined, it can be observed that there are fewer studies evaluating the real sector confidence index compared to studies examining the economic confidence index. This situation can be explained by the fact that the evaluation of the real sector confidence index by taking into account the sector employees covers a more limited area.

In this study, the relationship between the real sector economic confidence index and employment in each sector will be analysed one by one. In this direction, the variables whose relationship with the real sector economic index will be analysed are Industry Sector Employment, Building Sector Employment and Service Sector Employment. The fact that there is no study analysing the relationship between these 3 variables in the literature indicates the contribution of this study to the literature.

In the studies examined, it was observed that traditional unit root tests and, in addition to these tests, traditional causality tests Granger causality and Toda Yamamoto causality test were frequently used. Relevant tests are effective in determining the direction of the relationship between the variables under examination.

This study increases the reliability of the study and subsequently the effectiveness of the study in the literature by including sine and cosine values in the analysis by using the Fourier analysis method, which is among the new generation tests, in addition to the traditional analysis methods of the relationship between the data obtained from the World Bank database and the real sector economic confidence index and industrial, construction and service sector employment between 2009:01-2023:08 in Turkey. The tests applied in the study can be expressed as "Fractional Frequency Fourier Augmented Dickey Fuller Unit Root Test" and "Fourier Toda Yamamoto Test". The high reliability of the tests applied increases the effectiveness of this study in the literature.

As a result of examining the causality relationship between the variables examined in non-stationary series using the Toda-Yamamoto test, no causality relationship was found between employment in the service sector and real sector economic confidence. In addition, a unidirectional causality was detected from the real sector economic confidence index to the building sector and industrial sector employment.

In line with the data obtained from this study, sectoral employment has no effect on the real sector economic confidence index. In addition, real sector economic confidence affects employment in construction and industrial sectors. The reason for this situation may be the expectations of construction and industrial sector employees and officials on the economy. This is because these two sectors concentrate on production activities and revise their production amounts in the light of economic forecasts. Failure to meet the expectations after the production activities are shaped in line with the expectations may negatively affect those operating in the construction and industry sectors and cause them to incur losses. This situation cannot be limited only to the amount of production, but can also be explained by situations such as the expansion and development of production facilities. In this direction, it is necessary to act in accordance with the precautionary principle and it is recommended that emergency plans be created by those operating in the relevant sectors.

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