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RELATIONSHIP BETWEEN EMPLOYMENT, CONFIDENCE INDEX, AND COST INDEX: AN APPLICATION FOR THE TURKISH CONSTRUCTION SECTOR

İSTİHDAM, GÜVEN ENDEKSİ VE MALİYET ENDEKSİ İLİŞKİSİ: TÜRKİYE İNŞAAT SEKTÖRÜ İÇİN BİR UYGULAMA

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Abstract: The manufacturing industry is the real driver of growth for developing country economies. However, the sectors that trigger economic growth differ due to geographical reasons and structural changes. The construction sector is also one of those sectors that have a share in economic growth in some countries. In this case, the structure of the construction sector, the concerns about the future of the sector, and the labor supply to which the sector responds gain importance.

In the study, the cost structure in the Turkish construction sector, the expectations of the sector stakeholders, and how much it is affected by the economic structure were analyzed with the data. Since it is a sector that has a say in employment, to what extent the employment structure of the sector is affected by the current economic situation was also investigated. Since the variables used in the study are not frequently encountered in the literature, the aim is to analyze the relationship between the variables, while providing solidity to the literature on this subject. In the analysis made using the monthly data of the Turkish Statistical Institute (TUIK), the relationship between employment rates, sector confidence index, and cost index for the construction sector in Turkey between the years 2015-2020 was analyzed with ADF-PP and Toda-Yamamoto Causality Test. In the study, no causality relationship was found from the construction sector confidence index to the employment rate. It was concluded that as the number of workers in the construction sector increased, the confidence in the construction sector also increased.

Keywords: Employment, Confidence Index, Cost Index, Construction Sector

JEL: E2, E24, L7

Öz: *Gelişmekte olan ülke ekonomileri için imalat sanayi büyümenin gerçek itici gücüdür. Bununla beraber ekonomik büyümeyi tetikleyen sektörler coğrafi sebeplerle ve yapısal değişikliklerden kaynaklı olarak farklılık göstermektedir. Bazı ülkelerde inşaat sektörü de ekonomik büyüme içerisinde pay sahibi sektörlerden biri konumundadır. Bu durumda inşaat sektörünün yapısı, sektörün geleceği ile ilgili kaygılar ve sektörün cevap verdiği emek arzı da önem kazanmaktadır.*

Türkiye inşaat sektöründeki maliyet yapısının, sektör paydaşlarının beklentileri ve ekonomik yapıdan ne kadar etkilendiği verilerle yorumlanmıştır. İstihdam konusunda söz sahibi bir sektör olduğundan, sektörün istihdam yapısının da mevcut ekonomik durumdan ne ölçüde etkilendiğine değinilmiştir. Çalışmada kullanılan değişkenlere literatürde çok rastlanmaması nedeniyle amaç bu konuda literatüre katı sağlamakla beraber değişkenler arasındaki ilişkinin araştırılmasıdır. Bu çalışmada Türkiye İstatistik Kurumu'ndan (TÜİK) alınan aylık veriler kullanılarak yapılan analizde Türkiye'ye ait 2015-2020 yılları arasındaki inşaat sektörü için istihdam oranları, sektör güven endeksi ve maliyet endeksi arasındaki ilişki ADF-PP ve Granger Nedensellik Testi ile analiz edilmiştir. Çalışmada inşaat sektörü güven endeksinden

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istihdam oranına doğru herhangi bir nedensellik ilişkisi tespit edilememiştir. İnşaat sektöründe çalışanların sayısı arttıkça inşaat sektörüne duyulan güvenin de arttığı sonucuna varılmıştır.

Anahtar Kelimeler: *İstihdam, Güven Endeksi, Maliyet Endeksi, İnşaat Sektörü*

1. Introduction

One of the important variables in the study is employment, which is an important macroeconomic variable. One of the main problems of global economies, regardless of developed, developing and underdeveloped countries, is employment (Akcan, 2019: 172; Özen Atabey, 2020: 723). Global crises, economic recessions and the inadequacy of the qualifications of the workforce to meet the industrial development are the triggers of the employment problem (Murat, 2007: 193). The broad definition of employment refers to the participation of all factors of production in the production process (Işığıçok, 2014: 123). In the narrow sense, employment is; refers to the use of only the labor factor in the production of goods and services (Yağmur, 2009: 7).

Sectoral differences in economies form the basis of the economic agenda and problems. The most effective formula for the realization of the growth targets of the economies is the increase in production and its reflection on domestic product figures (Kenessey, 1987: 359). The realization of production depends on the manufacturing industries, particularly in the economies of developing countries. In addition, the share of sectoral production items with their structural decompositions is very large. In this context, it is considerably significant to define and know the characteristics of the sectors, which are differentiated production items, and their structural differences

While agriculture, industry and service sectors constitute the basic sectors of the economies, some economies also focus on different sectors due to their growth structure. Considering the sectoral development, the Construction Sector in Turkey is one of the sectors with a high share in economic growth. Different factors, such as geographical conditions, structural elements, and adaptation to the workforce structure, are at the root of such structural sectoral differences in the country's economies (Akcan, 2019: 172; Canöz and Erdoğdu, 2019: 834).

In this case, it is necessary to examine structurally the sectors that are the driving force in the economy; in other words, the internal and external stakeholders of the mentioned sector need to be addressed. The level of exposure of the sector in international markets, the level of being affected by global crises, the rate of meeting the sectoral labor supply, the sectoral cost index, and the determination of the sectoral confidence index are of great importance in terms of measuring its size and its contribution to growth (Canöz and Erdoğdu, 2019: 834).

Among the factors mentioned above, the sectoral confidence index is important for determining the size and future of the sector. For the construction sector, which is discussed here, this index gives information about the point reached in the sector, especially during the pandemic process.

For the determination of the status of the construction sector, data such as the Construction Confidence Index and Construction Cost ratio are shared in recent years, with the calculations made by the Turkish Statistical Institute. In addition, the data of the labor supply, which is employment in the construction sector, have been shared

for many years. Detailed graphs related to these data are examined in the following sections of the study.

Calculating the Construction Confidence index in EU standards also provides the opportunity to calculate international factors. In this process, the equilibrium method, which is the calculation method used by the Union in Turkey, is used. At this point, it is important that the answers given to business managers are negative and positive. The answers given are evaluated, and the difference between the percentage of positive answers and the percentage of negative answers is taken. This difference is called the equilibrium coefficient. The diffusion index is calculated for each survey question by adding 100 to the equilibrium coefficient. Confidence index for the sector is calculated by calculating the arithmetic average of the diffusion indices.

According to the results, the confidence index should be between 0 and 200. If it is greater than 100, you have optimistic expectations for the sector; however, if it is less than 100, it is concluded that there are pessimistic expectations for the sector (TUIK, 2022).

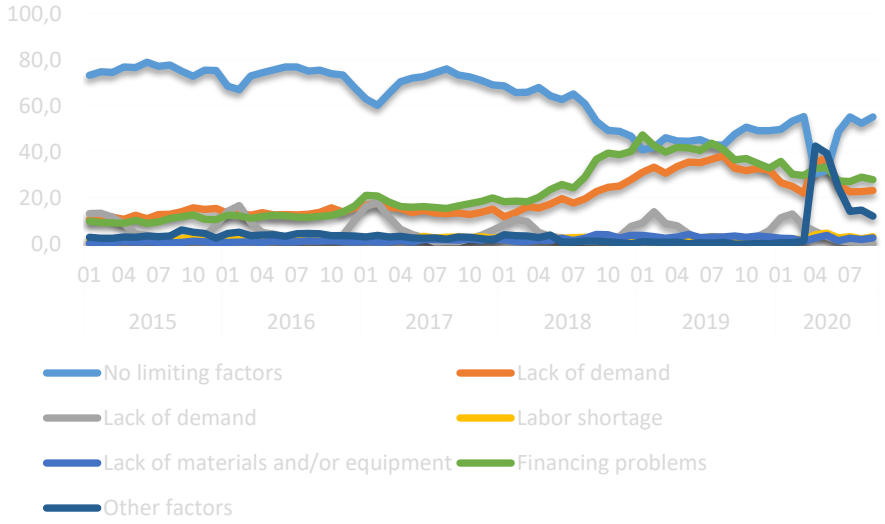
In the following sections of the study, data representing employment, confidence index and cost index will be presented through graphics in the Construction Sector. The study will be concluded with the modeling of the data and interpreted.

Table 1. Average Quarterly Contributions to GDP Growth

Period	Construction Sector%	Average Quarterly Growth%
2015-2016	0.37	4.65
I. Quarter 2017	0.40	5.30
IV. Quarter 2017	0.40	7.30
I. Quarter 2018	0.46	7.50
IV. Quarter 2018	-0.50	-2.70
I. Quarter 2019	-0.50	-2.60
IV. Quarter 2019	-0.30	6.40
I. Quarter 2020	-0.20	4.50
IV. Quarter 2020	-0.60	5.87

Source: Turkish Statistical Institute, data portal, 2021.

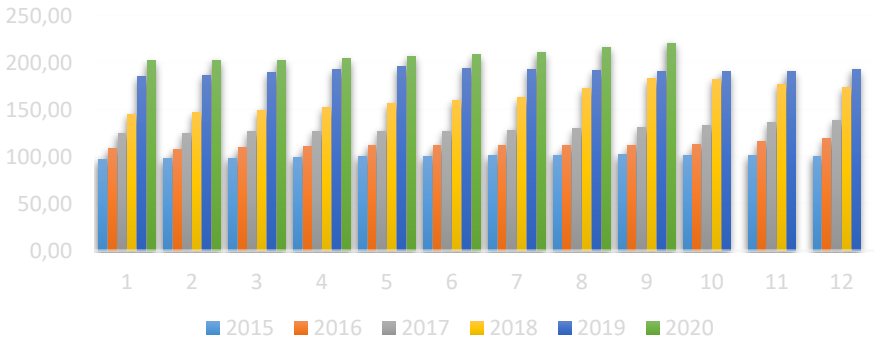
When the table above is examined, it is seen that the construction sector has shrunk in recent years. In addition, the sector presents negative indicators with the effect of the pandemic. The contraction in the sector continued in 2020. When the agriculture, industry and services sectors are also evaluated, the average quarterly growth contributions are also calculated. The ongoing contraction in the construction sector differs with the quarterly average growth rates.



Graph 1. Main Factors Restricting Activities in the Construction Sector

Source: Turkish Statistical Institute, data portal, 2021.

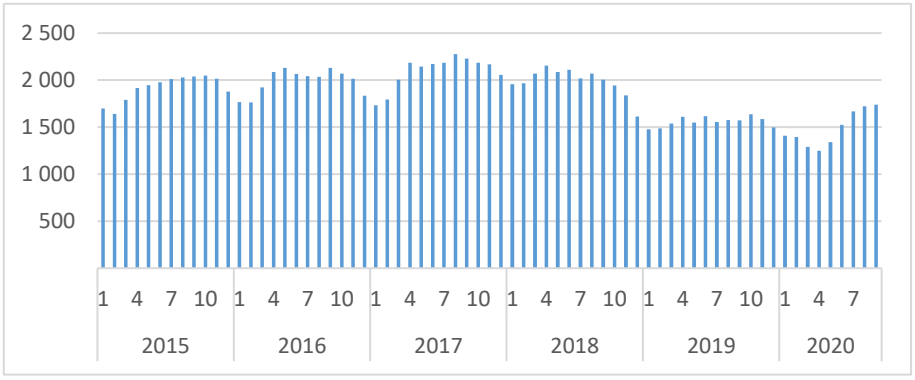
While the construction confidence index data is considered in the light of the data received from the Turkish Statistical Institute, the total number of employees and their expectations, the current level of registered orders received, the general trend in the economy, and the consumer confidence index components are used as sub-components in the calculation of this index (KPMG 2021 Report, 10). The Construction Sector Confidence Index is created by the Turkish Statistical Institute as a result of bringing together both workplace and consumer surveys and adapting these surveys in accordance with European Union standards (www.tüik.gov.tr).



Graph 2. Construction Cost Index Change Rate

Source: Turkish Statistical Institute, data portal, 2021).

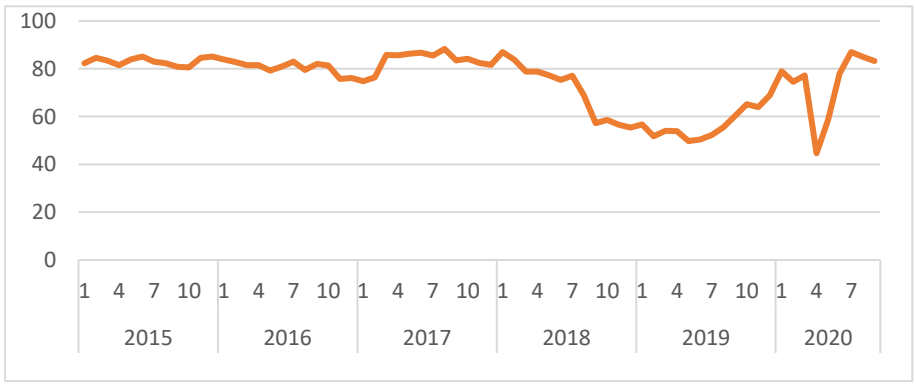
When the graph is examined, cost increases are observed in the cost index since the middle of 2020 with the effect of the pandemic. The construction cost index increased by 2.11% in September 2020 compared to the previous month and by 16.11% compared to the same month of the previous year. Considering the previous month, the material index increased by 3.48%, while the labor index decreased by 0.75%. In addition, the material index increased by 16.90% and the labor index increased by 14.41% compared to the same month of the previous year.



Graph 3. Employment Rates in the Construction Sector

Source: Turkish Statistical Institute, data portal, 2021.

As mentioned above, it can be said that there is a contraction in the construction sector, which also affects employment rates in the construction sector. It is observed that there is a direct correlation between the increase in cost indices and the construction sector cost index and sector employment rates. However, when the shares of the sector in total employment are examined, the share of the construction sector in total employment decreases with the pandemic. It will be seen in the following parts of the study that the increase in the employment rate in the construction sector will result in a positive effect on the construction confidence index. The following table can be examined for the development process of the construction sector confidence index.



Graph 4. Construction Sector Confidence Index

Source: Turkish Statistical Institute, data portal, 2021.

Since the construction sector is one of the fundamental sectors playing an active role in growth, it is sensitive to cyclical fluctuations. Since the raw material input moves with the exchange rate, the basic indicators of the sector also move in this direction. Although it is known that the fluctuating course of the confidence index is explained by market structures, the main reason for the recent economic contraction is the economic effects of the pandemic conditions. It is also known that the construction sector is the sector with the most pessimistic expectations as of June 2019.

The elimination of the negative effects of Covid-19 in the context of the economic construction sector has been possible with the discovery and application of the vaccine. The sector, which experienced serious disruptions, has started to contribute to growth again as a result of the vaccination process. With the variant news, a new activity has occurred in the markets, and this situation has caused a downward trend in the expectations of the construction sector.

2. Literature Review

It is seen that the study has not been studied much in Turkey in the context of the literature, and that existing studies mostly focus on consumer and producer confidence indices, exchange rate volatility related to the construction sector and their association with housing sales prices. In this context, the study aims to contribute to the literature.

Saar et al. (2019) conducted a study for Malaysia to investigate the effects of the construction cost index in developing countries. The quantitative data collection method was used as the data collection method. For the data, 1000 sets of surveys were distributed to construction sector stakeholders, and Principal Component Analysis and Structural Equation Model were used to analyze the data. It was concluded that the incentives of local governments, in particular, had a vital role in the concept of the construction cost index.

Münyas (2019) conducted a study on the relationship between share indices and sectoral confidence indices. In the study, BIST 30, BIST 50 and BIST 100 indices were used as share indices. Indices, including the construction sector confidence index, also constituted the independent variables of the study. In that study, the data belonging to the periods [2011.Q1-2018.Q3] and the Quantile Regression Models were used, and a relationship could not be found between the share indices and the Construction Sector Confidence Index. Using the monthly data for the period of January 2011 and June 2019, they were examined in terms of symmetric causality with the Hacker and Hatemi-J (2006) test and asymmetric causality with the Hatemi-J (2012) test. In the study, an asymmetric causality relationship was found between the variables.

In their study, Canöz and Erdoğdu (2019) aimed to investigate the relationship between sectoral confidence indices, including the construction confidence index, and BIST sector indices.

Atabeyli et al. (2018) aimed to understand the effects of the historical data of different economic variables on the Construction Cost Index. In the light of the data of the Turkish Statistical Institute for the 2005 and 2017 periods, the relationship between the three factors (construction labor input index, domestic producer price index and consumer price index) and the Construction Sector Cost Index was explained. In that

study, there was a very strong negative relationship between the Construction Sector Cost Index and the Construction Labor Input Index. In this context, when there was an increase in the Construction Labor Input Index, a decrease was observed in the Construction Sector Cost Index.

Çetin and Doğaner (2017) processed their data for 01: 11 - 03: 17 periods using the Granger Causality Test. In that study, they aimed to indicate the relationship between the construction confidence index and housing prices. According to the findings obtained as a result of the study, a relationship between the construction sector confidence index and the housing price variables was found, and this relationship was determined to be a one-way relationship towards housing prices.

Fırat and Soyu (2014) aimed to examine the effects of the global crisis economy on the construction sector with the example of Turkey. In the study, the basic economic indicators of Turkey during the crisis were examined by taking into account the construction sector and GDP. As a result of the study, the construction sector in Turkey was found to be one of the sectors most affected by the global crisis. In addition, in that study, it was concluded that the stagnation experienced in the construction sector during the crisis also had negative effects in terms of employment.

An and Wang (2012) explained the relationship between exchange rate volatility and import, producer and consumer price indices. In their study, they established a VAR model limited to 9 OECD countries. In the study, they used import, producer and consumer index data of 9 OECD countries for the years 1980-2007. The effect of exchange rate pass-through on the import price index was determined to be greater than the effect on the producer and consumer price index, both in the short and long run.

3. Econometric Analysis

3.1. Dataset and Methods

This study analyzed the relationship between employment rates, sector confidence index, and cost index for the construction sector in Turkey between the years 2015-2020. In the analysis made using the monthly data from the Turkish Statistical Institute, the employment rate is shown with “IO”, whereas the construction cost index is indicated with “ME” and the construction cost index is shown with “GE”. Eviews 10 program was used in the analysis, and ADF (Augmented Dickey-Fuller Test) and PP (Philips-Perron) unit root tests and Granger Causality test (1995) were applied to the variables.

As a result of eliminating the existing deficiencies of the Dickey Fuller Unit Root Test, the Generalized Dickey Fuller Unit Root Test was introduced to the literature in 1981 and is widely used. Dickey Fuller Unit Root Test models employing three different models are as follows (Taş et al., 2017: 270-271):

$$\Delta Y_t = \lambda Y_{t-1} + \mu_t \quad (1)$$

$$\Delta Y_t = \alpha_0 + \lambda Y_{t-1} + \mu_t \quad (2)$$

$$\Delta Y_t = \alpha_0 + \alpha_1 t + \lambda Y_{t-1} + \mu_t \quad (3)$$

The first equation is used in equations where trend and equation do not include constant term effect among the variables, the second equation is used in cases where

constant effect is observed, and the third equation is used in equations where both constant term and trend effect are observed.

In addition to these, P. Phillips and P. Perron developed a different unit root test in 1988 which is sensitive to the correlation in error terms and variable variance. In this context, the fourth equation is established as follows (Çiçek et al., 2010: 148).

$$\tau_{\delta} = t\delta \left(\frac{\gamma 0}{f0}\right)^{1/2} - \frac{T\,(f0 - \gamma 0)\,(se(\hat{S}))}{2\sqrt{f}\,s} \quad (4)$$

In this equation, $\hat{S}$ represents the coefficient estimate and $se(\hat{S})$ represents the standard error of δ.

Determining the relationship between the variables is significant. R. Engle and C. Granger (1987) developed the priority test created on time series to show the causal relationship between variables. When different equations are used, the test is used as the Engle Granger Causality Test. Equations 5 and 6 are shown below (Engle and Granger, 1987: 251-276):

$$Y_t = \sum_{i=1}^{m} \alpha i Yt - i + \sum_{i=1}^{m} \beta i Yt - i + \varepsilon_{1t} \quad (5)$$

$$X_t = \sum_{i=1}^{m} \theta i Xt - i + \sum_{i=1}^{m} \gamma i Yt - i + \varepsilon_{2t} \quad (6)$$

The Engle Granger Causality Test is used in the analysis of short-term causal relationships between variables. In addition, the test fails to detect a long-term relationship. For this, Johansen Cointegration Test is generally used.

3.2. Empirical Findings

A series is considered stationary if its mean, variance and autocovariance do not change over time. The Extended Dickey-Fuller (ADF) and Philips-Perron (PP) unit root tests were used to investigate the stationarity of the series in the study, in which the time series approach was used as the econometric method. The hypotheses of these tests are as shown below.

H_0: The series contains a unit root (not stationary).
H_1: The series has no unit root (it is stationary).

If the H_0 hypothesis is accepted, the series is not decided to be stationary and it can be made stationary by taking the difference. Table 1 indicates the results of the ADF and PP unit root tests performed. In the ADF and PP tests, the absolute value of the test statistics being greater than the critical value means that the series do not contain unit roots. According to the test results made in this direction, it is seen that all variables contain a unit root in their level values; however, when the first difference is taken, the unit root disappears. In other words, the series of the IO, ME and GE variables are stationary when their first difference is taken into account.

Table 2. Augmented Dickey- Fuller (ADF) Unit Root Test Results

	ADF				PP			
	Constant							
	I (0)		I (1)		I (0)		I (1)	
Variables	t-Statistics	Critical value + Probability value	t-Statistic	Critical value + Probability value	t-Statistic	Critical value + Probability value	t-Statistic	Critical value + Probability value
IO	-0.748378	-3.531592 [0.8267]	-6.655583	-3.531592* [0.0000]	-0.800762	-3.530030 [0.8124]	-6.759637	-3.531592* [0.0000]
ME	0.213758	-3.530030 [0.9716]	-6.873494	-3.531592* [0.0000]	0.186914	-3.530030 [0.9699]	-6.768227	-3.531592* [0.0000]
GE	0.211305	-3.530030 [0.2403]	-8.287284	-3.531592* [0.0000]	-2.006473	-3.530030 [0.2835]	-8.547389	-3.531592* [0.0000]
	Constant and Trend							
	I (0)		I (1)		I (0)		I (1)	
	t-Statistic	Critical value + Probability value	t-Statistic	Critical value + Probability value	t-Statistic	Critical value + Probability value	t-Statistic	Critical value + Probability value
IO	-2.120782	-4.100935 [0.5249]	-6.623517	-4.100935* [0.0000]	-1.592272	-4.098741 [0.7859]	-6.687247	-4.100935* [0.0000]
ME	-2.114455	-4.098741 [0.5284]	-6.842590	-4.100935* [0.0000]	-2.252781	-4.098741 [0.4533]	-6.731566	-4.100935* [0.0000]
GE	-2.216055	-4.098741 [0.4731]	-8.275243	-4.100935* [0.0000]	-2.086504	-4.098741 [0.5437]	--8.660057	-4.100935* [0.0000]

Note: * expresses stationarity at 1% significance level according to Mac Kinnon (1996) critical values. Values expressed in square brackets indicate probability values.

To perform the Toda-Yamamoto test, determining the maximum degree of integration (d_{max}) and adding the optimal lag length (p) to this value are necessary. Then, it will be possible to perform the Toda-Yamamoto causality test with the ($p+d_{max}$) value found.

The maximum degree of integration (d_{max}) was determined as "1" as a result of the ADF and PP unit root tests. In fact, all series become stationary at their first difference; in other words, they are first order integrated.

The optimal lag length (p) was obtained with the VAR model. The data on the optimal lag length in line with the established VAR model are shown in Table 2. Optimal lag length is "2" according to LR test statistic (LR), Final Estimator Error (FPE), Akaike

Information Criterion (AIC), and Hannan-Quinn Information Criteria (HQ) values, whereas it is "1" according to the Schwarz Information Criteria (SC).

Table. 3 Optimal Lag Length for VAR Model

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-196.7334	NA	0.221922	7.008190	7.115719	7.049979
1	26.26005	414.6896	0.000122	-0.500353	-0.070236*	-0.333195
2	42.97197	29.31916*	9.32e-05*	-0.770946*	-0.018243	-0.478420*
3	47.20281	6.977179	0.000111	-0.603607	0.471683	-0.185713
4	55.74656	13.19034	0.000114	-0.587599	0.810279	-0.044336
5	63.35929	10.95166	0.000123	-0.538923	1.181542	0.129708
6	70.90042	10.05484	0.000133	-0.487734	1.555317	0.306265
7	78.49239	9.323467	0.000147	-0.438329	1.927309	0.481038
8	84.78660	7.067187	0.000172	-0.343390	2.344836	0.701346
9	88.86104	4.145922	0.000224	-0.170563	2.840249	0.999541
10	94.35557	5.012551	0.000284	-0.047564	3.285836	1.247909
11	104.6869	8.337525	0.000316	-0.094275	3.561711	1.326565
12	122.4163	12.44171	0.000284	-0.400571	3.578002	1.145638

* indicates the optimum lag length selected by the sequential modified LR test statistic (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Information Criterion (HQ).

The VAR model established with the lag numbers indicated by the information criteria should meet the stability condition and should not contain any autocorrelation problems. In this direction, diagnostic tests are important. In line with the diagnostic tests, there was an autocorrelation problem in the VAR model, which was established with the lag numbers suggested by the information criteria, and the optimal lag number for the VAR model was re-determined as "5" so that these problems could be eliminated.

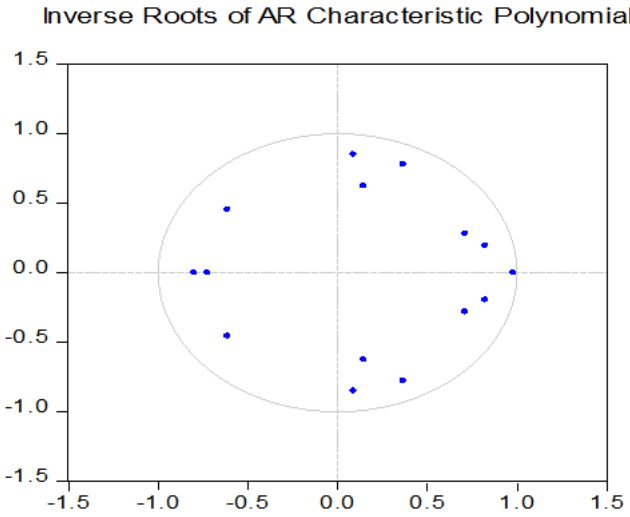


Figure 1. Inverse Roots of AR Characteristic Polynomial

Figure 1 shows the distribution of the Inverse Roots of the AR Characteristic Polynomial constructed according to the VAR model established with the optimal lag length (p) 5 determined according to the diagnostic tests. As can be understood from

the figure, the inverse roots of the AR polynomial of all variables are in the unit circle; In other words, the VAR model satisfies the stability condition.

Table 3 shows the results of the LM Test performed to find out the autocorrelation problem in the VAR model. Looking at the probability values in the table, it is seen that there is no autocorrelation problem.

Table 4. Autocorrelation LM Test Results

Lag	LM-Test Statistic	Probability
1	6.397763	0.6995
2	5.500427	0.7887
3	9.693198	0.3759
4	8.303868	0.5038
5	3.778800	0.9254
6	12.86858	0.1686

The model of the Toda-Yamamoto (1995) causality test is as follows:

$$Y_t = a_0 + \sum_{i=1}^{p+d_{max}} a_{1i} Y_{t-i} + \sum_{i=1}^{p+d_{max}} a_{2i} X_{t-i} + u_t \quad (7)$$

$$X_t = \beta_0 + \sum_{i=1}^{p+d_{max}} \beta_{1i} X_{t-i} + \sum_{i=1}^{p+d_{max}} \beta_{2i} Y_{t-i} + v_t \quad (8)$$

The hypotheses of the model are:

H_0: X is not the Granger cause of Y.

H_1: X is the Granger cause of Y.

In the Toda-Yamamoto causality test, the VAR model is established by adding the maximum degree of integration (d_{max}) of the variables to the optimal lag length (p) and finding the ($p+d_{max}$) value. In this respect, the results of the Toda-Yamamoto causality test estimated with the VAR model through the consideration of the ($p+d_{max}$) value of 5+1=6, are shown in Table 4.

Table 5. Toda-Yamamoto Causality Test Results

Direction of Causality	**P+ d_{max}**	**X^2 Statistics**	**Probability**	**Decision**
GE→IO	5+1	2.664418	0.7516	Ho Kabul
ME→IO	5+1	3.730125	0.5889	Ho Kabul
IO→GE	5+1	38.50862	0.0000	Ho Red
ME→GE	5+1	6.934833	0.2255	Ho Kabul
IO→ME	5+1	0.919843	0.9688	Ho Kabul
GE→ME	5+1	3.198409	0.6694	Ho Kabul

Considering the results of the Toda-Yamamoto causality test in Table 4, no causal relationship was found between the construction confidence index and the cost index in the construction sector, and from the construction confidence index to the employment rate. In a similar way, no causal relationship was found between the construction sector cost index and the construction sector employment rate. However, there was a causal relationship from the construction sector employment rate to the construction sector confidence index.

4. Conclusion

Growth is one of the main goals of developing economies. In this case, the economies support the growth of different sectors as well as the main sectors on the way to realizing growth. While economic growth is closely related to developing economies, the movements in international markets are also very effective for the same country groups.

Considering its contributions to the economy in terms of both growth and employment, the construction sector has an important share. The fact that this sector is affected by the developments in the market and that it affects the country's economy in this direction shows that the construction sector has a dynamic structure. In particular, the construction sector’s hypersensitivity to exchange rate volatility has a negative impact on the construction sector's input. In the study, cost index evaluation was made according to years, and with the start of the pandemic process, the construction sector, which was in a dynamic structure, has adversely been affected by this situation. Since the construction cost index is calculated by the combination of different components, the changes to be experienced will also affect different items in the market.

Since the construction sector has a large area and a share in the growth in the Turkish economy, the past indicators, current developments, and future expectations of the sector affect the economy and investments from different aspects. The relationship between the direction of these expectations and the sales of the construction sector and investment rates has been studied before in the literature. However, the relationship of the construction cost index and the construction confidence index with employment is another dimension that needs to be studied to contribute to the literature.

Employment is one of the chronological problems of developing country economies. The employment problem in the country's economies imposes serious burdens on the public sector. In order to overcome structural problems in employment, the production sectors that are compatible with the labor supply and geographical structure should be supported. In the previous sections of the study, it was mentioned that different sectors that support economic growth in a country were determined by geographical and structural factors. The graphs in the study also show that the employment structure of the sector is affected by the current economic conditions and that the employment in the sector has decreased recently as a result of the contraction in the construction sector due to the pandemic. The COVID-19 pandemic has resulted in major recessions in world economies. Depending on the situation, there is a total stagnation in the country's economies in the sectoral context. The construction sector is a sector that should be examined in terms of its share in growth, its share in investments, and its response to labor supply for the Turkish economy. It is observed that the construction

sector has experienced stagnation during the pandemic process; however, short-term recovery has been experienced with government support in certain periods, as shown in the graphs above.

In this study, the construction sector was discussed with graphs from these aspects, and the data related to employment data, construction confidence index, and construction cost index were examined as an empirical study. The causality test indicated that no causality relationship was found between the construction sector confidence index and the cost index in the construction sector, and from the construction sector confidence index to the employment rate. In a similar way, no causal relationship was found between the construction sector cost index and the construction sector employment rate. However, there was a causal relationship from the construction sector employment rate to the construction sector confidence index.

The economies of the countries in which the construction sector is among the leading sectors should implement policies that reduce construction costs and increase the employment rate in the construction sector. Future work may also address other drivers of economic growth.

References

Akcan, A. T. (2018). İstihdam oluşturmayan büyümenin Türkiye ekonomisinde geçerliliği. *İşletme Araştırmaları Dergisi*, *10*(2), 171-183.

An, L., and Wang, J. (2012). Exchange rate pass-through: Evidence based on vector autoregression with sign restrictions. *Open Economies Review*, *23*(2), 359-380.

Atabeyli, N., Kuru, M. ve Calis, G. (2018). Using historical data of economic variables in investigating variations in building construction cost index. *Creative Construction Conference*, Ljubljana, Slovenia, 30 June - 3 July 2018.

Canöz, İ. ve Erdoğdu, A. (2019). Sektörel güven endeksleri ve BİST sektör endeksleri arasındaki ilişkilerin simetrik ve asimetrik nedensellik analizi. *Yönetim ve Ekonomi*, *26*(3), 833-849.

Çetin, G. ve Doğaner, A. (2017). İnşaat sektörü güven endeksi ve konut fiyat endeksi arasındaki ilişki: Türkiye için ampirik analiz. *İktisat Politikası Araştırmaları Dergisi*, *4*(2), 155-165.

Çiçek, H., Gözegir, S. ve Çevik, E. (2010). Bir maliye politikası aracı olarak borçlanma ve ekonomik büyüme ilişkisi: Türkiye örneği. *Cumhuriyet Üniversitesi İktisadi ve İdari Bilimler Dergisi*, *11*(1), 141-155.

Engle, R. and Granger, C. W. J. (1987). Co-integrationand error correction: Representation, estimation and testing. *Journal of Econometrica*, *55*(2), 251-276.

Işığıçok, Ö. (2014). Temel sosyal politika sorunları. A. Tokol ve Y.Alper (Ed.), *Sosyal Politika* (5.Baskı) içinde (119-159. ss.). Bursa: Dora Basım Yayın.

Kenessey, Z. (1987). The primary, secondary, tertiary and quaternary sectors of the economy. *Review of Income and Wealth*, *33*(4), 359-385.

KPMG TÜRKİYE (2021). KPMG perspektifinden inşaat sektörüne bakış. Erişim adresi: https://home.kpmg/tr/tr/home/gorusler/2021/08/2021-kpmg-perspektifinden-insaat-sektorune-bakis.html

Murat, E. (2006). *Türkiye'de sanayi katma değeri ve enerji tüketimi ilişkisi*. (Yayımlanmamış yüksek lisans tezi). Balıkesir Üniversitesi Sosyal Bilimler Enstitüsü, Balıkesir.

Münyas, T. (2019). Borsa İstanbul endeksleri ile güven endeksleri arasındaki ilişkinin araştırılması üzerine bir inceleme. *TESAM Akademi Dergisi*, *Türkiye Ekonomisi Özel Sayısı*, 299-320.

Özen Atabey, A. (2020). Türkiye'deki kadın istihdamı, erkek istihdamı ve ekonomik büyüme arasındaki ilişki: Toda-yamamoto nedensellik testi". *Academic Social Resources Journal*, *5*(19), 823-834.

Saar, C. C., Chuing, L. S., Yusof, A. M., Zakaria, R. and Chuan, T. M. (2019). Construction cost index: a case study in Malaysia. *Sriwijaya International Conference on Science, Engineering, and Technology*, IOP Conf. Series: Materials Science and Engineering, 012059.

Taş, T., Alptekin, V. and Yılmaz, K. Ç. (2017). The stability of money demand under the structural breaks in Turkey. *Journal of Current Researches on Business and Economics*, *7*(1), 265-280.

Toda, H. Y., Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of Econometrics*, *66*(1), 225-250.

Türkiye İstatistik Kurumu. (2022). Erişim adresi: www.tüik.gov.tr

Yağmur, A. (2009). *İstihdam edilebilirlik açısından eğitim-istihdam ilişkisi: Konya bölgesi imalat sanayi örneği.* (Yayımlanmamış yüksek lisans tezi). Selçuk Üniversitesi, Konya.