

THE IMPACT OF LABOUR MARKET REGULATIONS ON THE MACROECONOMIC PERFORMANCE OF TÜRKİYE: AN ARDL BOUNDS TEST APPROACH

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Abstract

The relationship between labour market regulations and macroeconomic performance is accepted as a complex and controversial issue in the economics literature. The research investigates the effect of labour market regulations on Türkiye's macroeconomic performance during the period of 1980–2021, using the Labour Market Regulations Index (LMRI), which reflects the flexibility or rigidity of the labour market regulations and based on seven dimensions, and the Macroeconomic Performance Index (MPI) measured by the Magic Hypercube (MH) method, incorporating four aspects of economic performance which are economic growth, current account, inflation, and unemployment. The research employs the Autoregressive Distributed Lag (ARDL) model to examine the existence and direction of cointegration relationship between LMRI and MPI and finds out that there is a cointegration between them. Still, when checked in detail, it seems that labour market regulations do not have a statistically important long-term effect on Türkiye's macroeconomic performance.

Keywords: Market Regulations, Macroeconomic Performance, ARDL, Türkiye.

JEL Codes: E60, J01

İŞGÜCÜ PİYASASI DÜZENLEMELERİNİN TÜRKİYE'NİN MAKROEKONOMİK PERFORMANSINA ETKİSİ: ARDL SINIR TESTİ YAKLAŞIMI

Öz

İşgücü piyasası düzenlemeleri ile makroekonomik performans arasındaki ilişki, ekonomi literatüründe karmaşık ve tartışmalı bir konu olarak kabul edilir. Araştırma, Türkiye'nin 1980-2021 döneminde işgücü piyasası düzenlemelerinin makroekonomik performansı üzerindeki etkisini incelemekte; bunu yaparken, işgücü piyasası düzenlemelerinin esnekliğini veya katılığını yansıtan ve yedi boyutta temellendirilen İşgücü Piyasası Düzenlemeleri Endeksi (İPDE) ile ekonomik performansın ekonomik büyüme, cari hesap, enflasyon ve işsizlik olan dört yönünü içeren ve Sihirli Hiperküp (SH) yöntemi ile ölçülen Makroekonomik Performans Endeksi'ni (MPE) kullanmaktadır. Araştırma, İPDE ve MPE arasındaki eşbütünleşme ilişkisinin varlığını ve yönünü incelemek için Otoregresif Dağıtılmış Gecikme (ARDL) modelini kullanmakta ve bu iki endeks arasında bir eşbütünleşme olduğunu bulmaktadır. Ancak daha detaylı bir inceleme yapıldığında, işgücü piyasası düzenlemelerinin Türkiye'nin makroekonomik performansı üzerinde uzun vadeli istatistiksel olarak anlamlı bir etkisinin olmadığı görülmektedir.

Anahtar Kelimeler: İşgücü Piyasası Düzenlemeleri, Makroekonomik Performans, ARDL, Türkiye.

JEL Kodları: E60, J01

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INTRODUCTION

The relationship between labour market regulations and macroeconomic performance is a complex and controversial issue in the economics literature. On one side of the argument, there are studies maintain that conducting flexible Labour Market Regulations (LMR)⁴ can develop macroeconomic performance by increasing the efficiency and adaptability of the labour market, reducing labour costs and rigidities, and promoting employment and growth. On the other hand, there are also studies argue that stringent labour market restrictions can develop macroeconomic performance by the augmentation of worker security and bargaining strength, the promotion of human capital and innovation, and the stabilization of income and demand (Belot, Boone, and van Ours, 2014).

Having potential to create a balance between efficiency and equity LMR are accepted having both positive and negative impacts on a country's economic performance and social well-being. In this regard, since they protect the interests and fundamental rights of the workers, guaranteeing the minimum standards of working and living conditions, and mitigating instances of inequality together with discrimination, they are accepted as favorable in order to develop equity or fairness within the labour market. On the other hand, since leading the costs and barriers on employers, which are regarded as a restriction of the flexibility and adaptability of the labour market to reply to the fluctuations in demand and unforeseen shocks, they are accepted as unfavorable for the efficiency and productivity of the labour market, due to also these regulations may discourage the creation of employment opportunities and ultimately prevent economic progress. Likewise, the macroeconomic performance of a country is a multidimensional issue, too, which represents the multiple aspects of economic activity, such as first, economic growth, as a proxy of nation's economic output levels; second, the current account as a proxy of external balance; third, inflation as a proxy of price stability, and fourth, unemployment as a proxy of labour utilization (Jha and Golder, 2008).

A country's macroeconomic performance can be affected by many factors including fiscal and monetary policies, trade and investment flows, productivity and competitiveness, as well as institutional and structural reforms. In this regard, the research is aiming at investigating the effect of labour market regulations on macroeconomic performance for the case of Türkiye for the period of 1980-2021. For this, the study uses two comprehensive indicators: The Labour Market Regulations Index (LMRI)⁵ and the

⁴ LMR are the rules and institutions that regulate and govern the complex employment relationship between employees and employers. Due to they are directly concerned with the factors related to the hiring and firing process, the wage-setting mechanism, the working hours and conditions, social security and protection, and labour mobility and migration they affect the labour market in a multidimensional way (Ernst, Merola, and Reljic, 2022).

⁵ It is a composite index that reflects the flexibility or rigidity degree of the labour market regulations based on seven factors such as 1- Minimum wage and Labour regulations, 2- regulations of hiring and firing, 3-flexible wage determination, 4-hours regulations, 5-costs of worker dismissal, 6- conscription, 7-foreign labour.



Macroeconomic Performance Index (MPI)⁶ by conducting the ARDL model in order to examine the existence and direction of the cointegration, beside the short and the long run effects of the labour market regulations on the macroeconomic performance of Türkiye from 1980 to 2021. In this regard, an important short coming of the existing studies is that they focus principally on the examination of LMR's effects on individual variables such as unemployment (Marelli, Choudhry, and Signorelli, 2013; Adascalitei and Pignatti Morano, 2016; Rafi, 2017; Liotti, 2020, 2022) or on the output, labour productivity, market efficiency, inflation, and growth (Squire and Suthiwart-Narueput, 1997; Calderón and Chong, 2005; Duval and Furceri, 2018; Daşbaşı et al., 2019), this study, however, examines the relationship between LMRI and MPI, which synthesizes four macroeconomic indices that are GDP growth, current account, inflation, and unemployment which provide a comprehensive and a holistic examination of the impact of the LMRs on the macroeconomic performance of Türkiye. Using the ARDL model, this research provides a comprehensive analysis of the long-term effects of LMRs on Türkiye's macroeconomic performance. So, it can be said that this original research tries to bridge a significant gap in the literature since it provides a detailed perspective on the macroeconomic implications of labour market regulations. The findings can be accepted of utmost importance since they provide valuable insight for policymakers as they confront the complexities of labour market interventions and their wide-ranging effects on national economies. In the research following the introduction part, a brief literature review is tackled first and then the empirical part is handled before the conclusion part followed by the appendixes showing Türkiye's MPI using Magic Hypercube and the evolution of the 7 components of LMRI in Türkiye for the period of 1980-2021.

LITERATURE REVIEW

For many years, researchers have been studying the influence of labour market regulations on macroeconomic performance. In the last years, similar interest in investigating this relationship in Türkiye has emerged. This brief literature review investigates the existing research on the influence of labour market regulations on the macroeconomic performance of Türkiye and some countries, identifying the major results.

Among the studies that investigate the macroeconomic performance of Türkiye, Doğan (2022) analyzed Türkiye's macroeconomic performance from 2010 to 2020 by using GDP growth rate, GDP per capita, export-import ratio, FDI inflow, interest rate, inflation rate, and unemployment rate in order to evaluate the macroeconomic performance. In their study where Criteria Importance Through InterCriteria Correlation (CRITIC) and Additive Ration Assessment (ARAS) methods were employed, the findings

⁶ It is measured by the Magic Hypercube method, which is a multidimensional approach that includes four aspects of economic performances: 1-Economic growth, 2-current account, 3-inflation, and 4-unemployment.

revealed that Türkiye had the strongest macroeconomic performance in 2012, followed by 2015 and 2013. It was discovered that the weakest performance occurred in 2020. Al and Demirel (2022) examined Türkiye's macroeconomic performance throughout 2002-2019. They conducted the TOPSIS method, which used inflation, economic growth, current account and unemployment factors to define performance requirements. The weighing of the criterion was done using Kaldorian, Keynesian, and Heterodox techniques. Research results showed that the highest macroeconomic performance was in 2002, while the worst was in 2008. Daşbaşı, Barak, and Çelik (2019) examined Türkiye's MPI between 1990 and 2017 by employing Artificial Neural Network (ANN) method based on the method of OECD. The results showed that based on the OECD estimate the weight of the unemployment rate remained at 20%, economic growth decreased from 30% to around 27%, and inflation declined from 20% to 17%, while the weight of the budget and current account deficit components remained at 20% and 17%, respectively. Güran and Tosun (2005) analyzed Türkiye's macroeconomic performance on the basis of economic growth, inflation rate, and unemployment rate employing a non-parametric method known as Data Envelopment Analysis (DEA) for the period of 1951-2003. The results reveal that Türkiye's macroeconomic performance decreased, particularly, in the 1980s. In addition to this outcome, Türkiye's macroeconomic performance throughout the crisis years was rather bad. Eleren and Karagül (2008) examined the performance of Türkiye's economy between 1986-2006 by using the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method. According to the results, Türkiye showed the best performance in 1986 in terms of economic performance. Karabulut, Ersungur, and Polat (2008) investigated the macroeconomic performance of Türkiye and European Union countries for the 2001-2005 period by using the Data Envelopment Analysis (DEA) and Malmquist Total Factor Productivity Index methods. The outcomes showed that Türkiye is the fifth best country among all countries in terms of efficiency, and it is the twenty-first country in terms of change in total factor productivity. Coşkun (2022) studied the macroeconomic performances of Brazil, Russia, India, China, South Africa and Türkiye (BRICS-T countries) for the period from 2011 to 2020. Variables such as GDP, GDP per capita, exports, growth rate, foreign direct investment, imports, inflation rate, and unemployment rate were used as macroeconomic performance indicators. Weighted Aggregated Sum Product Assessment (WASPAS) method was applied. According to the results, China's macroeconomic performance is much better than that of other nations. Brazil, Russia, India, Türkiye, and South Africa are the other nations in order of success after China. Wang and Le (2018) studied the macroeconomic performance of developed economies and developing Asian nations for the periods from 2013 to 2016 and from 2017 to 2020. Variables such as real GDP growth, government gross debt, unemployment and inflation rates are used as macroeconomic indicators and the DEA method was conducted. The empirical findings show that the United States, Singapore, and Switzerland have accomplished the most successful macroeconomic management.



Among the studies that investigate the labour market regulations's impacts, Kovaci, Belke, and Bolat (2018) investigated the impact of labour market regulations on unemployment in the selected OECD countries for the period from 2005 to 2014 by conducting panel data analysis. The results revealed that flexible labour market regulations have a strong negative impact on all unemployment indicators, and higher labour market flexibility lowers unemployment rates. Liotti (2022) empirically investigated the relationship between the LMRI and youth unemployment in 28 European countries for the period of 2000-2018 by using the Pooling Mean Group (PMG) method. The study demonstrated that the two most important factors in lowering teenage unemployment are more economic development and greater investment in active labour market policies. Using the LMRI to capture labour market regulations and youth unemployment, the findings didn't provide unambiguous results about the results of the high flexibility of labour regulations as a good instrument to reduce unemployment in Europe. Calderón and Chong (2005) examined if LMR are an obstacle to long-term growth by using panel data of 76 countries from 1970 to 2000. In their study where the GMM-IV system estimator and possible endogenous regressors in a dynamic panel data model were used, the results revealed that a reduction in the number of regulations has a considerable impact on growth and there is a conflicting relationship between growth and the scope of labour regulations. Liotti (2020) investigated the relationship between economic crisis, labour market flexibility and youth unemployment in Italy for the period from 2001 to 2016 by using the ARDL model. The LMRI was used as a proxy for labour market flexibility, the real growth rate was used to capture the prolonged decline in GDP during the crisis, where it was used as a dummy variable (takes the value of 1 if it is positive, and 0 if it is negative), and the unemployment rate which includes youth and adults in Italy from 2001 to 2016. The outcomes expressed that the economic downturn has mostly impacted young employees, however, there was no clear evidence that increased labour market flexibility improved young unemployment rates. Rafi (2017) used panel data from 2000 to 2012 for OECD countries. The study intended to examine the magnitude of the relationship between labour market regulations' flexibility and the unemployment rate. According to the study, improvements in labour market regulation flexibility within the OECD effectively reduce unemployment and labour underutilization. Marelli et al., (2013) evaluate the influence of the LMRI, along with many other explanatory factors, on young and total unemployment in OECD nations from 1980 to 2009. The findings indicated that beside the economic development, economic freedom, and active labour market policies, labour market reforms (flexible LMRI) are an effective instrument for lowering unemployment and improving labour market performance. Duval and Furceri (2018) used panel data from 26 advanced economies from 1970 to 2014 to estimate the dynamic macroeconomic effects of labour and product market reforms on output, employment, and productivity and conclude that the impact of labour market reforms is primarily on employment, but it varies across types of reforms and depends on overall business cycle conditions. Moreover, reductions in labour tax wedges and increases in public spending on

active labour market policies have larger effects during periods of slack. In contrast, reforms to employment protection arrangements and unemployment benefit systems have positive effects in good times. Squire and Suthiwart-Narueput (1997) used panel data from 1978 to 1991 from developing countries. The paper explores how labour market regulations affect efficiency when not everyone follows the rules and concludes that there might be limits to how much efficiency is lost due to labour market regulations when there is incomplete compliance. Adascalitei and Pignatti Morano (2016) used data from 110 developed and developing economies for the period of 2008–2014 to analyse the determinants and short-term effects of labour market reforms. The study reveals that deregulatory labour market reforms tend to increase the unemployment rate in the short run when they are approved during contractionary periods, while they have a non-significant effect when approved during periods of economic stability or expansion.

Table 1: A Literature review of empirical studies

Author(s)	Period	Methodology	Area(s)	Findings
Coşkun (2022)	2011 - 2020	WASPAS	BRICS-T	China's macroeconomic performance is much better than that of other nations. After China the other nations in order of success are as follows: Brazil, Russia, India, Türkiye, and South Africa.
Doğan (2022)	2010-2020	CRITIC and ARAS	Türkiye	The findings revealed that Türkiye had the strongest macroeconomic performance in 2012, followed by 2015 and 2013. It was discovered that the weakest performance occurred in 2020.
Al and Demirel (2022)	2002-2019	TOPSIS	Türkiye	The highest macroeconomic performance was in 2002, while the worst was in 2008.
Liotti (2022)	2000-2018	PMG	28 European countries	The study demonstrated that the two most important factors in lowering teenage unemployment are more economic development and greater investment in active labour market policies.
Liotti (2020)	2001-2016	ARDL	Italy	The outcomes expressed that the economic downturn has mostly impacted young employees, however, there was no clear evidence that increased labour market flexibility improved young unemployment rates.
Daşbaşı, Barak, and Çelik (2019)	1990-2017	ANN based on OECD method	Türkiye	Weight of the unemployment rate remained at 20%, economic growth declined from 30% to around 27%, and inflation diminished from 20% to 17%, while the weight of the budget and current account deficit components remained at 20% and 17%, respectively.

Kovaci, Belke, and Bolat (2018)	2005-2014	Panel Data Analysis	Selected OECD Countries	Results revealed that flexible labour market regulations have a strong negative impact on all unemployment indicators, and higher labour market flexibility lowers unemployment rates.
Wang and Le (2018)	from 2013 to 2016 and from 2017 to 2020	DEA	Developed Countries, Developing Asian Nations	The empirical findings show that the United States, Singapore and Switzerland have accomplished the most successful macroeconomic management.
Duval and Furceri (2018)	1970-2014	Panel Data Analysis	26 Advanced Economies	The paper concludes that the impact of labour market reforms is primarily on employment, but it varies across types of reforms and depends on overall business cycle conditions.
Rafi (2017)	2000-2012	Panel Data Analysis	OECD Countries	Improvements in labour market regulation flexibility within the OECD effectively reduce unemployment and labour underutilization
Adascalitei and Pignatti Morano (2016)	2008-2014	Panel Data Analysis	110 Developed and Developing Economies	The study finds that deregulatory labour market reforms tend to increase the unemployment rate in the short run when they are approved during contractionary periods—while they have a non-significant effect when approved during periods of economic stability or expansion.
Marelli, Choudhry, and Signorelli (2013)	1980-2009	Panel Data Analysis	OECD Countries	The findings indicated that beside the economic development, economic freedom, and active labour market policies, labour market reforms (flexible LMRI) are an effective instrument for lowering unemployment and improving labour market performance.
Eleren and Karagül (2008)	1986-2006	TOPSIS	Türkiye	Türkiye showed the best performance in 1986 in terms of economic performance.
Karabulut, Ersungur, and Polat (2008)	2001-2005	DEA	Türkiye and European Union countries	The outcomes showed that Türkiye is the fifth best country among all countries in terms of efficiency.
Güran and Tosun (2005)	1951-2003	DEA	Türkiye	The results reveal that Türkiye's macroeconomic performance decreased, particularly, in the 1980s.
Calderón and Chong (2005)	1970-2000	GMM-IV System Estimator and Possible Endogenous Regressors in a Dynamic Panel Data Model	70 countries	Results revealed that a reduction in the number of regulations has a considerable impact on growth and there is a conflicting relationship between growth and the scope of labour regulations.

Squire and Suthiwart-Narueput (1995)	1978-1991	Panel Data Analysis	Developing Countries	The paper suggests that there might be limits to how much efficiency is lost due to labour market regulations when there is incomplete compliance.
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EMPIRICAL ANALYSIS

The research utilizes the ARDL model to investigate the existence and direction of the cointegration relationship, as well as the short and long-term effects of the labour market regulations on the macroeconomic performance of Türkiye from 1980 to 2021. For this, first, the unit root tests of the series will be conducted, according to the results the cointegration of the series will be investigated with some diagnostic tests.

Data Selection

The research employs two comprehensive indicators, which are shown in Table 2, to measure the labour market regulations and the macroeconomic performance of Türkiye. The first indicator is the LMRI, which is a composite index that reflects the degree of flexibility or rigidity of the labour market regulations in Türkiye based on seven dimensions: Hiring and firing regulations, labour regulations and minimum wage, flexible wage determination, hours regulations, costs of worker dismissal, conscription, and foreign labour. LMRI, which was developed by the Fraser Institute, is determined from the Fraser Economic Freedom Ranking 2021⁷.

The second indicator is the MPI measured by the Magic Hypercube method, which is a multidimensional approach that encompasses four aspects of economic performance: economic growth, current account, inflation, and unemployment. The macroeconomic variables data sets were taken from the World Bank Data. The index is calculated by the authors according to Saavedra-Rivano and Teixeira (2017)'s methodology⁸.

⁷ Fraser Institute (2021),

<https://www.fraserinstitute.org/economic-freedom/dataset?geozone=world&year=2021&page=dataset&min-year=2&max-year=0&filter=0>

⁸ Here, in this methodology, all four scales must be adjusted to be homogeneous by normalizing the graphic to a unit area. They presented the normalised variables as follows: Y' , τ' , φ' , and ζ' for growth, current account, inflation, and unemployment, respectively; The process of normalization required a transformation of the initial rates as follows:

$$[0 \leq Y' \leq \alpha]; [0 \leq \tau' \leq \alpha]; [0 \leq \varphi' \leq \alpha]; [0 \leq \zeta' \leq \alpha].$$

Where $\alpha = 1$

$$Y' = \frac{1}{\min + \max} (\min + Y)$$

$$\tau' = \frac{1}{\min + \max} (\min + \tau)$$

$$\varphi' = \frac{1}{\max - \min} (\max - \varphi)$$

$$\zeta' = \frac{1}{\max - \min} (\max - \zeta)$$

According to the MH approach, the macroeconomic performance index is calculated as follows.



Table 2: Data selection

Symbol	Variables
LMRI	Labour Market Regulations Index elaborated by Fraser Institute
MPI	Macroeconomic Performance Index calculated using the Magic Hypercube approach

Unit Root Tests

The Null Hypothesis and Alternative Hypothesis of the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) Unit Root Tests are the same and as follows:

Null Hypothesis (H0): The time series data has a unit root (is not stationary).

Alternative Hypothesis (H1): The time series data has not a unit root (is stationary).

Table 3: The Unit root tests of ADF and PP

Variables	Augmented Dickey-Fuller Test					
	Level			First Differences		
	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)
LMRI	0.333822	-1.825875	-1.891694	-6.197696***	-6.175747***	-6.093944***
MPI	-1.109953	-5.415717***	-5.335391***	-9.462006***	-9.342966**	-9.192618***
Variables	Phillips-Perron Test					
	Level			First Differences		
	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)	Without Intercept & Trend (None)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)
LMRI	0.333682	-1.879151	-1.954135	-6.197696***	-6.175729***	-6.093911***
MPI	-1.443853	-5.415717***	-5.335391***	-13.29890***	-13.27905**	-13.50514***

* Denotes significance at 10%; ** Denotes significance at 5%; *** Denotes significance at 1%.

According to the outcomes obtained based on the ADF and the PP tests, presented in Table 3, the variables are not stationary at the same order of integration, since the LMR index is stationary at first difference, whilst the MPI is integrated at its level. To avoid the spurious findings resulting from regressing

$$\mu = \gamma' \cdot \tau' \cdot \phi' \cdot \zeta'$$

Where the MPI value calculated with the MH varies between 0 and 1.

$$0 \leq \mu \leq 1$$

a non-stationary time series on another non-stationary time series, the non-stationary time series must be transformed into stationary. As a result, it is enough to consider the first differences of the time series in question (Gujarati, 1999: 760). Indeed, when the KPSS test is conducted, which is regarded as the most appropriate one for the small numbered data, the findings show that both of the series are stationary at their first differences as seen in Table 4.

Table 4: Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) (1992)

Variables	KPSS Test			
	Level		First Differences	
	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)	Without Trend (Constant)	Intercept with Trend (Constant, Linear Trend)
LMRI	0.158602***	0.094375***	0.080322***	0.080193***
MPI	0.084658***	0.064568***	0.141642***	0.154468***

*** denotes significance at 1% level.

Critical values for the KPSS test: 0.739, 0.463, and 0.347 for the 1%, 5% and 10% significance levels, respectively (Kwiatkowski-Phillips-Schmidt-Shin, 1992, Table 1).

The Null Hypothesis and Alternative Hypothesis of the KPSS Unit Root Tests are as follows:

Null Hypothesis (H0): The time series data is stationary.

Alternative Hypothesis (H1): The time series data is not stationary.

According to the findings reported in Table 4, the KPSS unit root test indicates that the null hypothesis of stationarity is accepted for both series, the LMRI, and MPI. So, the best way to measure the cointegration between such series is to conduct ARDL Bounds Test Approach since it has many advantages over the other cointegration methods such as it is more efficient in the researches with small samples, it does not care the integration levels of the series unless it is not more than 1, it can be used for the series that has different integration levels (Yamak and Erdem, 2017: 165). It is noted that the ARDL model, which lets the investigation of how changes in one variable affect the others over time with lagged values and is useful when dealing with variables that are integrated at different orders of I(0) or I(1) or a combination of both, captures both the short and long-run relationships among the variables (Pesaran and Shin, 1998).



ARDL Bounds Test Approach

In the Bounds Test approach, which has two steps where in the first one the availability of a long run relationship between two series is investigated and in the second one, short and long run coefficients are determined by using the series which were found out as cointegrated in the first step (Yamak and Erdem, 2017: 165; Tanrıöver and Yamak, 2015). In practice through the E-Views programme (10th Version), first ARDL regression is done and the model is checked whether it is convenient by residual diagnostics and then the bounds test approach is conducted to see whether there is a cointegration between the series together with the long term form in order to see the long term coefficients.

ARDL regression

As seen in Table 5, the model is selected as ARDL (1,0). In the model, where the dependent variable is MPI, there are its one lagged value as MPI(-1) and non-lagged value of LMRI as independent variables.

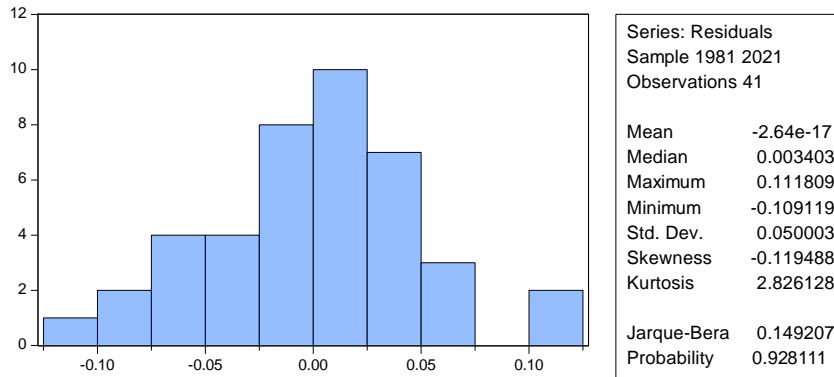
Table 5: ARDL regression test results

Variable	Coefficient	Std. Error	t-Statistic	P-value
MPI(-1)	0.153374	0.151693	1.011078	0.3184
LMRI	-0.015475	0.012249	-1.263392	0.2141
C	0.155683	0.058293	2.670706	0.0111
Selected Model: ARDL(1,0)				
R-squared 0.074150				
Adjusted R-squared 0.025421				
Durbin-Watson stat 2.013135				

Following the ARDL estimation, it is imperative to conduct a thorough Residuals Diagnosis before progressing to the Bounds test. This diagnostic phase encompasses several crucial tests, each serving a specific purpose.

Residuals Diagnosis

Figure 1: Normality test (Jarque-Bera)



Null Hypothesis (H0): The time series data comes from a normal distribution.

Alternative Hypothesis (H1): The time series data does not come from a normal distribution.

The Figure 1 above shows the Jarque-Bera normality tests, where notably high p-values serve as strong evidence of the normality assumption in all components and for the overall residuals, it can be said that the model is normally distributed.

Table 6: Breusch-Godfrey serial correlation LM test

F-statistic	0.159597	Prob. F(1,37)	0.6918
Obs*R-squared	0.176091	Prob. Chi-Square(1)	0.6748

Null Hypothesis (H0): There is no autocorrelation at any order less than or equal to p.

Alternative Hypothesis (H1): There exists autocorrelation at some order less than or equal to p.

Table 6 above presents the results of the Breusch-Godfrey Serial correlation LM tests for lags 1 to h. The observed p-values, surpassing the significance level of 0.05, signify substantial evidence supporting the absence of serial correlation.

Table 7: Heteroskedasticity test: Breusch-Pagan-Godfrey

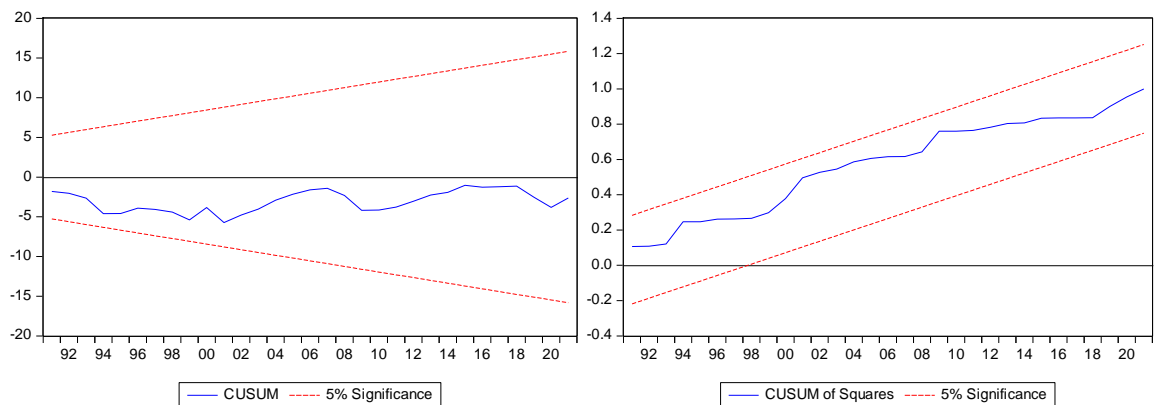
F-statistic	0.156203	Prob. F(2,38)	0.8559
Obs*R-squared	0.334322	Prob. Chi-Square(2)	0.8461
Scaled explained SS	0.262219	Prob. Chi-Square(2)	0.8771

Null Hypothesis (H₀): Homoscedasticity is present (the residuals are distributed with equal variance).

Alternative Hypothesis (H₁): Heteroscedasticity is present (the residuals are not distributed with equal variance).

The Breusch-Pagan-Godfrey test was used for the Heteroskedasticity test, and from the results in Table 7 above, since the P-value is greater than 5%, we cannot reject the null hypothesis of the homogeneity of the variance of residuals. Thus, the model has no Heteroskedasticity.

Figure 2: Stability diagnostics



The stability tests of CUSUM, and CUSUM of Squares, shown in Figure 2, confirm the stability of the model indicating that the estimated coefficients and relationships in the model are consistent and do not exhibit significant deviations or shifts over time.

Bounds test and long run relationship

After performing the bounds test, as seen in Table 8, it was found out that the F-statistic (10.51307) is greater than the critical value for the upper bound I(1) at the 1% significance level, which allow us to reject the null hypothesis stating that there is no cointegration relationship in the model, and accept the alternative hypothesis that a cointegrating relationship in the model does exist. Shortly, the bounds test results indicate a long-term relationship in the model.

Table 8: Bounds test

Significance level	Critical Value	
	I(0)	I(1)
1%	4.94	5.58
5%	3.62	4.16
10%	3.02	3.51
F-Statistic	10.51307	

On the other hand, as seen in Table 9, when the coefficient of LMRI is checked it is negative but statistically unimportant, telling that labour market regulations do not have a statistically significant long-term effect on the macroeconomic performance of Türkiye.

Table 9: Long run relationship estimation

Variable	Coefficient	Std. Error	t-Statistic	P-value
LMRI	-0.018279	0.014373	-1.271780	0.2112
C	0.183886	0.063651	2.888955	0.0064
EC = MPI - (-0.0183*LMRI + 0.1839)				

As seen in Table 10, CointEq term is both negative and statistically significant telling that the instability between the short run and long run recovers after one period, here, one year. Actually, it tells that in one year 0.85% is recovered or it can be said that total recovery is achieved in 1.18 period (14.16 months). On the other hand, a short run relationship was not detected.

Table 10: ARDL error correction regression

Variable	Coefficient	Std. Error	t-Statistic	P-value
CointEq(-1)*	-0.846626	0.146936	-5.761873	0.0000
R-squared		0.452248		
Adjusted R-squared		0.452248		
Durbin-Watson stat		2.013135		

CONCLUSION

The relationship between labour market regulations and macroeconomic performance is a complex and controversial issue in the economics literature. On one side of the argument, it is maintained that flexible LMR can enhance macroeconomic performance by increasing the efficiency and adaptability of the labour

market, reducing labour costs and rigidities, and stimulating employment and growth. On the other hand, it is advocated that stringent labour market restrictions can improve macroeconomic performance through the augmentation of worker security and bargaining strength, the promotion of human capital and innovation, and the stabilization of income and demand. In this regard, the study investigates the impact of labour market regulations, proxied by LMRI on the macroeconomic performance, proxied by MPI, of Türkiye during the period of 1980–2021 by using the ARDL model in order to examine the existence and direction of the cointegration relationship between the LMRI and MPI. The results indicate that there is a long-run relationship between the labour market regulations and the macroeconomic performance of Türkiye during the period of 1980–2021. However, when the coefficient of LMRI is checked it is negative but statistically insignificant, telling that labour market regulations do not have a statistically important long-term effect on the macroeconomic performance of Türkiye.

Since this study found no statistically significant long-term impact of labour market regulations on Türkiye’s macroeconomic performance, it is recommended that Türkiye embraces the principles of “Flexicurity”. “Flexicurity”, which was inspired by the Danish labour market model in the 1990s and adopted as an official EU policy in 2007, combines flexibility for employers with security for workers (Burchardt, 2020), and came as a response to the increasing volatility of labour markets, largely as a result of technological change and globalisation (Majcher-Teleon and Bardak, 2011: 7). Türkiye’s Labour Act No. 4857, adopted in 2003, partially incorporated flexicurity principles by safeguarding workers' employment conditions under flexible arrangements while ensuring basic rights and equality at the workplace (Dereli, 2014: 4). However, the act falls short of fully integrating the comprehensive flexicurity framework, which according to Majcher-Teleon and Bardak (2011), it includes four policy components:

- **Comprehensive Lifelong Learning Strategies:** Investing in lifelong learning to enhance worker adaptability and skill development.
- **Flexible Contractual Arrangements:** Implementing sufficiently flexible contracts that balance employer needs with worker security.
- **Effective Active Labour Market Policies (ALMPs):** Enhancing ALMPs to support job seekers and facilitate labour market transitions.
- **Modern Social Protection Systems:** Strengthening social safety nets to ensure security during employment transitions.

Despite facing opposition and doubts from scholars and social partners, particularly during hard times and crises like the global financial crisis of 2008 and the recent COVID-19 pandemic, “flexicurity” has shown a great potential for creating “a win-win situation” if adapted appropriately to suit local economic and political events (European Foundation for the Improvement of Living and Working Conditions, 2012). Furthermore, Türkiye should address gender inequalities and enhance human development. In this regard, enhancing Türkiye's position on the Human Development Index (HDI), where it ranks 45th out of 139 in 2023 (United Nations Development Programme, 2024), and bridging gender gaps, for which Türkiye ranks among the lowest in the world at 129th out of 149 in 2023 (World Economic Forum, 2023: 9), remain significant and critical steps. Besides, enhancing literacy rates and enrollment ratios will also contribute to overall human development.

Last but not least, by learning from the European context, where flexicurity is prioritised, Türkiye can tailor its policies to foster sustainable economic growth, even during economic downturns, which can enhance Türkiye's labour market policies, and contributing to a resilient and dynamic economy.

AUTHOR STATEMENT

The first author contributed 40% to the study. The second author contributed 35% to the study. The third author contributed 25% to the study. Researchers have not declared any conflict of interest.

Birinci yazar çalışmaya %40 oranında katkıda bulunmuştur. İkinci yazar çalışmaya %35 oranında katkıda bulunmuştur. Üçüncü yazar çalışmaya %25 oranında katkıda bulunmuştur. Araştırmacı(lar) herhangi bir çıkar çatışması bildirmemiştir.

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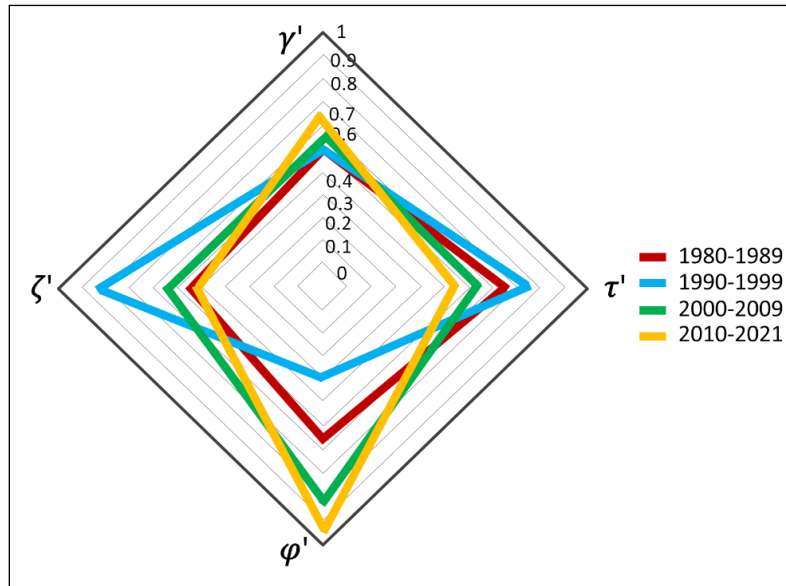
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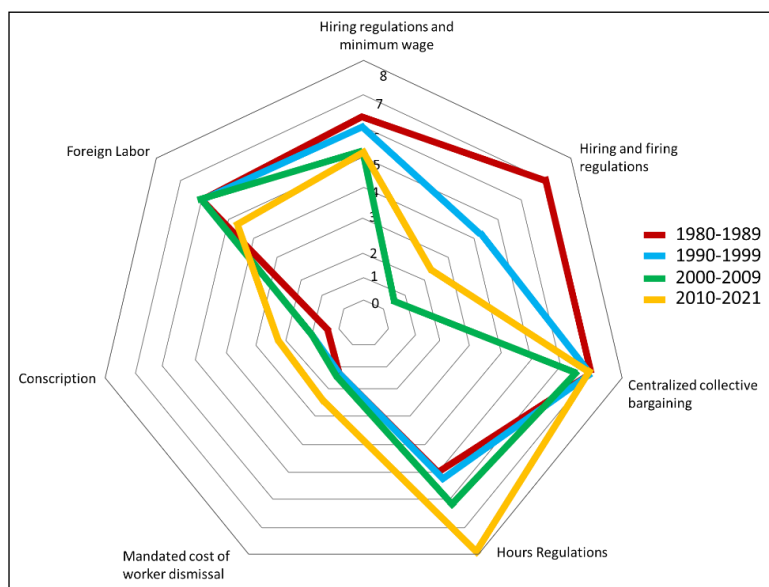
APPENDIXES

-Türkiye's Macroeconomic Performance Index Using Magic Hypercube, 1980-2021



Source: Prepared by the Authors, based on the calculations of Macroeconomic Performance Index using the Magic Hypercube approach

2-The Evolution of the 7 components of LMRI in Türkiye 1980-2021



Source: Prepared by the Authors based on DATA from Fraser Institute (LMR Index), 2021