Housing Index and Economic Factors: A Comparative Study of Turkey and Developed Countries

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Abstract: A housing index is a means of tracking the valuation of residential real estate within a given region or nation. Housing indices can be found in both the United States and international locations. The procedure entails collecting data from a wide variety of sources, and the resulting information can be helpful in recognizing patterns within the real estate market. The purpose of this research was to examine Turkey's housing index in relation to that of the United States of America, the United Kingdom, and Germany. The interest rate, unemployment rate, gross domestic product, population, and debt were the factors that were examined for each nation from 1982 to 2021. Following that, a regression analysis was carried out in order to investigate the impact that these aspects had on the housing index of each nation. According to the findings, Turkey demonstrates a unique housing index trend in comparison to highly developed nations like the United States, the United Kingdom, and Germany. In contrast, the gross domestic product (GDP) had a large part in the determination of the housing index in the United States, while the interest rate, unemployment rate, and debt were the primary factors that determined the housing index in Turkey. It was determined that the influence of debt on the housing index in Turkey was negative, in contrast to the positive impact that it had on the index in developed nations. In addition, the results of our research showed that the influence of interest rates on the housing indices of Germany and the United Kingdom did not constitute a statistically significant relationship. Instead, the GDP and population size were found to be significant predictors for these nations by our research. In contrast to the other countries that were investigated, the research showed that the rate of unemployment had a negative effect on the housing index in the United Kingdom (UK).

In this study, Turkey, the United States of America (USA), the United Kingdom (UK), and Germany are used as case studies to investigate the relationship between various economic indicators and the impact those indicators have on the housing index. The Gross Domestic Product, the Unemployment Rate, the Interest Rate, Population, and Debt are the Indicators that are Analyzed. The purpose of the study is to identify potential areas for policy action as well as to provide insights into the elements that influence the housing market in these nations.

1. Introduction:

Examining and comparing Turkey's housing index to that of industrialized nations is the issue this study seeks to answer. The housing index, which takes into account elements including affordability, availability, and market trends, acts as an essential gauge of the overall health and stability of the housing market. While developed nations have well-established housing markets with clear regulatory frameworks and stable economies, Turkey is an emerging market with its own set of problems and dynamics that could have a big impact on the country's housing index. In order to provide useful information for decision-makers, investors, and other stakeholders involved in the housing sector, this research attempts to investigate the differences, parallels, and underlying causes affecting the housing index in Turkey in comparison to developed countries.

We have taken three well established countries USA, UK and Germany for this comparison and consider their five key economic indicators, population, GDP, interest and unemployment rates along with their public debts to study the effects on the housing index. We select the data for 40 years from 1982 to 2021 for the said factors and the said countries for the analysis. The research was hypothesized as there is a difference in the housing indexes of Turkey and the comparing developed countries and the hypotheses are tested using a multiple linear regression for the time series data.

The objective of this scholarly article is to examine the influence of various macroeconomic indicators, including gross domestic product (GDP), population, debt, unemployment rate, and interest rate, on the housing index. To assess the comparative trend of developed countries, an analysis was conducted on the housing index of Turkey in relation to three other developed nations, namely the United States of America, the United Kingdom, and Germany. In order to conduct an impact analysis, time-series secondary data from the World Bank pertaining to the aforementioned nations and factors were utilised for the period spanning from 1982 to 2021. A multiple linear regression analysis was employed for this purpose.

This study is of paramount importance as it sheds light on the correlation between macroeconomic indicators and the housing market. The present study possesses the potential to provide valuable insights to policymakers and investors regarding the contemporary state of the economy, along with the potential risks and

opportunities in the housing sector. The results of this study may be employed to formulate strategies that promote both economic expansion and sustainable, cost-effective housing. Moreover, a comparative analysis of the housing index patterns observed in developed nations versus those in developing nations could provide insights into the impact of economic expansion on the real estate sector.

The study's policy recommendations are derived from the results of the multiple linear regression analysis, as per the research conducted. The purpose of these recommendations is to address the observed discrepancies and enhance Turkey's housing index. The concepts in question may encompass measures aimed at rendering housing more economically accessible, promoting ecologically responsible urban expansion, streamlining regulatory protocols, fostering investment in the housing sector, and enhancing the availability and transparency of data. The policy proposals aimed to offer actionable insights to policymakers, government agencies, and other stakeholders with the goal of promoting a more stable and inclusive housing market in Turkey.

The subsequent sections of the inquiry are delineated as follows. The subsequent section will entail an analysis of pertinent literature to enhance our comprehension of the characterizations and explanations of the aforementioned variables (namely, GDP, population, debt, unemployment rate, and interest rate) and their impact on the housing index. The methodology utilised for the investigation is delineated in Section 3. Section 4 of the document presents a discussion of the empirical findings obtained from the Augmented Dickey-Fuller (ADF) Unit Root Test. This section encompasses the examination of the multiple linear regression analysis and the evaluation of the regression assumptions. Section 5 contains recommendations that conclude the investigation. In summary, the references examined throughout this study have been compiled and presented at the conclusion to serve as a means of citation.

2. Literature Review

In recent years, numerous studies have been conducted to examine the relationship between the housing index and the housing market, and various economic, social, and demographic factors. These studies have highlighted the significance of this statistical indicator in the planning and development of a nation. The present studies center on the impact of said factors on the housing index and the housing market. The present study's reference materials include several research works that were examined and cited.

The study by Smith et al. (2018) examined the relationship between the housing market index and economic growth in the United States through a case study approach. The research was centered on the geographical region of the United States. The researchers' findings of a positive correlation between the housing market index and various economic indicators provide support for the proposition that a strong housing market contributes to the growth of the broader economy.

The study conducted by Johnson et al. (2019) aimed to compare the housing markets of the United Kingdom, Canada, and Australia with respect to the Housing Affordability Index and Household Well-being. This study conducted a comparative analysis of the housing affordability index across Australia, Canada, and the United Kingdom, with a focus on examining its impact on household well-being. The research indicates that a correlation exists between a housing market that is more economically accessible and an enhancement in the overall welfare of households, as well as a decrease in financial strain.

The study by Garcia et al. (2020) investigated the determinants of the housing price index in the member states of the European Union. The present research examined the factors that impact the housing price index within the member states of the European Union. The study's results indicate that various factors, including income levels, mortgage interest rates, population density, and economic growth, serve as significant determinants of housing prices.

Lee and colleagues (2021) conducted supplementary research on the Housing Market Index and Investor Sentiment in Asian nations. This study aimed to investigate the correlation between the housing market index and investor sentiment in Asian countries. The results indicate that alterations in the housing market index exerted a significant influence on the investor's mindset, implying that the state of the housing market had an effect on investor conduct.

The study by Tan et al. (2022) is a case study that examines the effects of government policies on the housing index in Singapore. The present research endeavours to examine the impact of the Singaporean government's policies on the housing index in Singapore. The study conducted an analysis of diverse policy initiatives, such as measures aimed at controlling prices and subsidies for housing, and their impact on the overall stability of the housing market. The results indicate that targeted policy interventions can effectively mitigate the cyclical fluctuations in housing prices.

Chen et al. (2019) performed a comprehensive market analysis of the global economy in their research on the Housing Price Index and Financial Stability. The present study examines the correlation between property price indices and the financial well-being of global markets. The study investigated the impact of fluctuations in

residential property values on significant indicators of economic soundness, including credit growth, household indebtedness, and the susceptibilities of the banking sector.

The study conducted by Rodriguez et al. (2020) was titled "A Cross-Country Analysis" and focused on the relationship between the Housing Index and Economic Inequality. The objective of this research was to examine the correlation between housing indices and economic disparity across multiple nations. The study examined the impact of fluctuations in property prices and affordability on income distribution and inequality, shedding light on the potential social implications of housing market dynamics.

The study conducted by Gupta et al. (2021) investigated the role of housing indices in promoting sustainable urban development in developing countries. The research was carried out through a case study titled "Case Studies for Developing Countries considering Housing Index and Sustainable Urban Development." The research investigated the potential utilization of housing indices as a means of monitoring advancements towards sustainable housing objectives, including but not limited to accessibility to fundamental amenities, affordability, and energy efficiency.

Wang et al. (2022) performed a comparative analysis of various machine learning techniques in their investigation of forecasting the housing price index. The objective of this research was to examine and contrast different machine learning methodologies for predicting housing price indices. The study evaluated the precision and reliability of various predictive models, such as artificial neural networks, random forests, and support vector machines, in forecasting future housing price trends. This was accomplished through an analysis of the models' performance in a performance evaluation.

The study conducted by Li et al. (2023) aimed to examine the implications of demographic changes, specifically an ageing population, on societies through an analysis of the Housing Index. The aim of this research was to examine the impact of changing demographics, specifically ageing populations, on housing indices. The study investigated the impact of evolving demographics and evolving housing preferences on the housing market dynamics, demand, and prices in countries experiencing significant population ageing.

The Housing Index and Market Liquidity were investigated by Kim et al. (2018) using Real Estate Investment Trusts (REITs) as the primary source of data. The present study aims to examine the correlation between housing indexes and market liquidity in the context of Real Estate Investment Trusts (REITs). The present research investigated the impact of changes in housing indices on the trading volume, bid-ask spread, and general market efficiency of real estate investment trusts (REITs).

Chen et al. (2019) conducted a case study on the Housing Index and Regional Disparities, which aimed to compare and contrast urban and rural areas. This study aimed to investigate the disparities in housing indices between urban and rural areas. The study examined the factors that contribute to the discrepancy in housing expenses, affordability, and market conditions between urban and rural areas. Moreover, it underscored the implications for regional progress and governmental measures.

Johnson et al. (2020) conducted a study on the Housing Index and Expectations for the Housing Market, utilizing Household Surveys as their primary data source. The objective of this investigation was to examine the correlation between housing indices and households' housing market expectations. The study employed survey data analysis to enhance comprehension of the impact of housing index perceptions and expectations on decision-making pertaining to housing, including budgeting for a household and determining whether to purchase or sell property.

A comparative analysis was conducted by Zhang and colleagues (2021) to investigate the relationship between Housing Index and Neighborhood Quality. The aim of this research was to examine the correlation between the state of the housing market and the characteristics of local communities by means of a comparative analysis of housing indices and indicators of neighborhood quality. The present investigation examined the extent to which housing indices are indicative of various attributes, including environmental quality, social cohesion, and resident safety levels within neighborhoods.

Martinez and colleagues (2022) conducted a study examining housing indexes and housing policy evaluations within the context of affordable housing programs. The results of their investigation are as follows: The aim of this research was to evaluate the effectiveness of affordable housing initiatives by examining the impact of policy interventions on housing indices. The study analyzed the impact of various housing policies, including rent control and housing subsidies, on the housing market's dynamics, housing affordability, and social implications.

The aforementioned studies provide novel perspectives on the correlation between housing indices and economic variables, encompassing affordability, investor outlook, financial soundness, economic disparity, sustainable growth, predictive methodologies, demographic factors, market fluidity, regional imbalances, household anticipations, residential area standards, and assessment of housing policies, alongside the influence of governmental measures on housing markets. Each research endeavor focuses on a specific context or locality,

with the aim of contributing to the existing knowledge base and enhancing a comprehensive understanding of the intricacies of the real estate industry, as well as the potential implications for policy.

3. Research Design:

The present study employs a quantitative research methodology that is based on secondary data sources. The process of gathering and evaluating quantitative data from pre-established sources, including government records, surveys, and financial reports of businesses, is a crucial component of a secondary data-based quantitative research strategy. The utilization of statistical analysis in this methodology facilitates the identification of patterns and correlations among variables, rendering it advantageous for investigating the influence of diverse economic factors on the housing index.

The utilization of secondary sources of data in quantitative research studies presents several advantages. Initially, it could be comparatively less time-consuming and cost-effective than collecting original data initially. Secondly, when contrasting with primary data collection, secondary data gathering may involve a larger sample size and a more extended time frame. In summary, it can be argued that secondary data may exhibit greater accuracy than primary data owing to its sourcing from established institutions or organizations that adhere to reliable data collection protocols. It is imperative for researchers to validate the precision and relevance of the secondary data they are utilizing. It is incumbent upon individuals to give due regard to the origin of the data, as well as any limitations or predispositions that may have been inherent in the primary data gathering process. Furthermore, it is imperative to ensure that the data is applicable to the objectives and conjectures of the investigation.

Statistical analysis techniques, including regression analysis, hypothesis testing, and time series analysis, can be employed to examine the influence of economic factors on the housing index. Regression analysis can be employed to investigate the relationship between the dependent variable, namely the housing index, and the independent factors, including GDP, population, debt, unemployment rate, and interest rate. This analytical approach can facilitate the identification of potential associations between the two sets of variables. The process of hypothesis testing can aid in the determination of the statistical significance of observed associations, while the examination of time series data can facilitate the identification of temporal trends and patterns.

4. Empirical Analysis:

For the research analysis we have taken a data for four countries Turkey, USA, UK and Germany for a period of 40 years from 1982 to 2021 for the variables Housing index, GDP, population, unemployment rate, interest rate and public debt. Since all the variables are having different scales so the data is normalized and converted to same scale using logarithm of the variables before using them into the analysis.

Augmented Dickey-Fuller (ADF)Unit Root Test was applied to verify the stationarity of the time series and the main results of the study are provide by the multiple linear regression analysis applied for each country separately. After the use of multiple linear regression the testing of the underlying assumptions including normality, heteroskedasticity, autocorrelation, Multicollinearity and the stability was done for the accuracy of analysis.

The results of the unit root tests suggest that the variables were non-stationary in their original form for all four countries. However, the use of differencing was able to create stationary variables that were suitable for statistical analysis. The exact number of times that the variables needed to be differenced varied across the countries and variables tested.In all the cases, the probability of unit root tests was greater than the commonly used threshold of 0.05, which indicates that the null hypothesis of the presence of a unit root cannot be rejected. This suggests that the variables are non-stationary in their original form, which can create challenges for statistical analysis.However, for Turkey it become stationary at first differenced while for the developed countries it become stationary at second difference. Therefore regressions for the countries were applied accordingly for each country individually. Table 1 shows the results of all the unit root tests.

Table 1: Augmented Dickey-Fuller (ADF)Unit Root Tests

Variables	Turkey		USA		UK		Germany	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept	Intercept	Trend and Intercept	Intercept	Trend and Intercept
LHI	0.059	0.202	0.217	0.307	0.370	0.567	0.570	0.670
LHI(-1)	0.000***	0.000***	0.124	0.098*	0.085*	0.137	0.103	0.093
LHI(-2)	0.000***	0.000***	0.000***	0.001***	0.000***	0.001***	0.002***	0.013**

LGDP	1.000	0.996	0.052	0.922	0.290	0.756	0.422	0.105
LGDP(-1)	0.001***	0.000***	0.09*	0.017	0.051	0.050	0.000***	0.000***
LGDP(-2)	0.000***	0.000***	0.000***	0.000***	0.000***	0.001***	0.000***	0.000***
LIR	0.000***	0.000***	0.563	0.408	0.914	0.456	0.370	0.567
LIR(-1)	0.000***	0.000***	0.000***	0.000***	0.314	0.700	0.217	0.307
LIR(-2)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.567	0.370
LUE	0.418	0.771	0.095*	0.272	0.229	0.323	0.574	0.652
LUE(-1)	0.002***	0.008***	0.000***	0.000***	0.017	0.049**	0.001	0.005***
LUE(-2)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
LD	0.108	0.311	0.973	0.842	0.390	0.786	0.433	0.666
LD(-1)	0.000***	0.000***	0.001***	0.002***	0.005***	0.025**	0.061	0.167
LD(-2)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
LP	0.370	0.567	0.001	1.000	1.000	0.965	0.184	0.945
LP(-1)	0.217	0.307	0.992	0.748	0.633	0.151	0.007	0.003***
LP(-2)	0.567	0.370	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***

Note:

** Values are significant at 0.05 level of significance

*** Values are significant at 0.01 level of significance

Table 2 shows the Multiple Linear Regression Analysis resultsof the housing index for fourdifferent countries. For Turkey, the interest rate, unemployment rate, and debt ratio have a significant effect on the housing index, and explaining dependent variable statistically73.7%. In the USA, GDP, interest rate, unemployment rate, and debt ratio are significant predictors, explaining dependent variable statistically99.53%. In the UK, English GDP, unemployment rate, population, and debt ratio are significant predictors, explaining dependent variable statistically97.58%. Finally, in Germany, English GDP, unemployment rate, population, and debt ratio are significant predictors, explaining dependent variable statistically 99.17%.

According to the F test results, all models are statistically significant at the 5% level.The models also provide information on the impact of each predictor variable on the housing index. For example, in Turkey, one unit increase in interest rate led to a 0.01745 unit increase in the housing index, while one unit increase in public debt led to a 0.9514 unit decrease in the target variable.

Table 2: Multiple Linear Regression Test Results							
Variables	**Turkey**		**USA**		**UK**		**Germany**	
C	2.726**	(2.652)	0.956	(0.3553)	-17.468***	(-4.872)	-21.306***	(-5.860)
LIR								
LIR (-1)	0.017**	(2.434)						
LIR (-2)			0.0124**	(2.303)				
LUE								
LUE (-1)	0.282**	(2.794)						
LUE (-2)			0.0401**	(2.548)	-0.119**	(-2.005)	0.101**	(2.360)
LD								
LD (-1)	-0.951**	(-2.837)						
LD (-2)			0.135***	(3.130)	0.0502**	(2.909)	0.253***	(4.313)
LP								
LP (-1)								

LP (-2)			1.5888** (3.660)	2.324*** (4.567)
LGDP				
LGDP (-1)				
LGDP (-2)		0.680*** (5.982)	2.526** (4.460)	0.952*** (6.718)
Adjusted R-Square	**0.737**	**0.995**	**0.972**	**0.99**
F-Statistic	**1.36**	**1435**	**274.5**	**813.17**
Probability (F-Statistic)	**0.027**	**0.000**	**0.000**	**0.000**
Note:				
** Values are significant at 0.05 level of significance				
*** Values are significant at 0.01 level of significance **(Bracket values)** are the values of t-statistics				

Regression Assumptions:

After getting the multiple regression results, the assumptions of the multiple linear regression tests are required to check for the accuracy of the regression. The first of them is the check of the distribution of the residuals.

Normality of residuals is a key condition for a linear regression model. It means that the differences between the predicted values and actual observations should follow a normal distribution (Tikhonova & Taras, 2015). When this assumption holds, it means that the model accurately represents the data and that the regression coefficients are dependable (Geerlings & van Assen, 2019). However, if the residuals deviate from normality, it implies that there may be issues with the model or that the underlying assumptions of the regression analysis are not valid. Hence, it is essential to verify the normality of residuals as a critical step in regression analysis (Granger & Newbold, 1986). Since the probability value for the Jarque-Bera test for all the countries are well above 5% the significance level, which refer to accept the assumption of the normality for the residuals generated by the proposed model, which is an important requirement for time series and econometric modeling and analysis. The results are presented in the figure 1 below:

Figure 1: Normality of Residuals
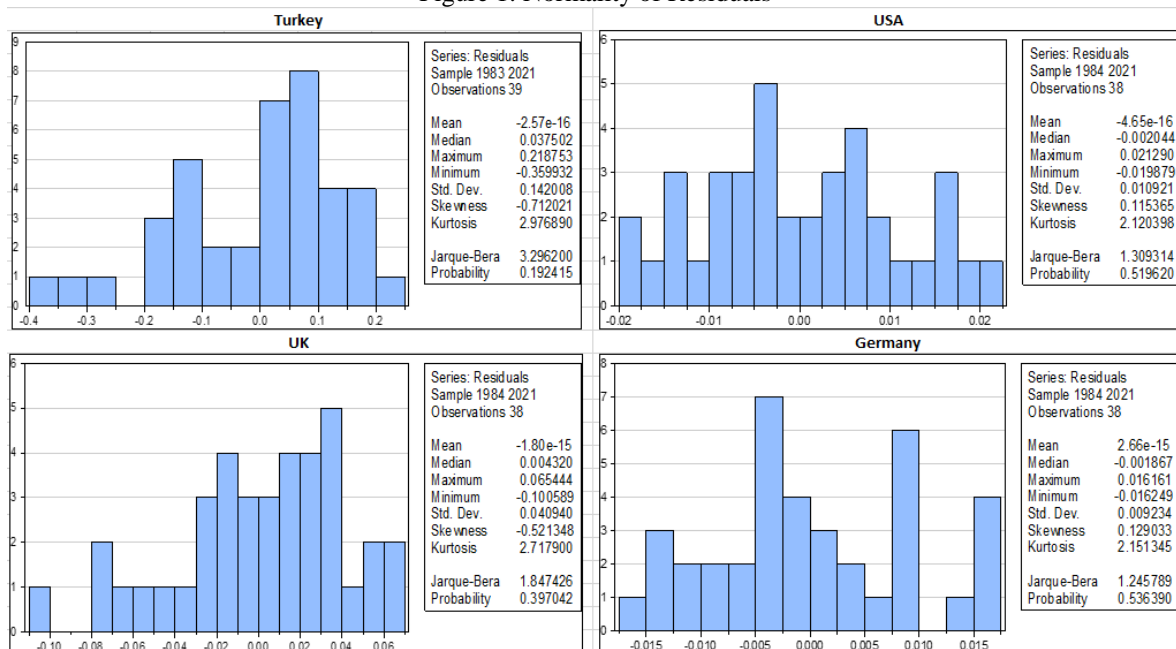
The second regression assumption is the absence of heteroskedasticity of the residuals. This is a barrier for the regression analysis which is an indication of variation in residual with the change in dependent and independent variables. Its presence refer to model the variance component of the residuals along with the mean model (Kim, 2018). Table 3 shows the testing results of heteroskedasticity As all the p-values for F and Chi-Square statistics under the Breusch-Pagan Godfrey tests for all four understudy models are more than 0.05, which refer no to reject Ho bearing the assumption of no heteroskedasticity and to determine that there found no significant proof of heteroskedasticity or misspecification in the proposed model.

Table 3: Breusch-Pagan-Godfrey Heteroskedasticity Test

Turkey	F-statistic	0.63259	Prob. F(4,34)	0.6427
	Obs*R-squared	2.70143	Prob. Chi-Square(4)	0.609
	Scaled explained SS	2.02944	Prob. Chi-Square(4)	0.7303
USA	F-statistic	2.80884	Prob. F(5,34)	0.315
	Obs*R-squared	11.6927	Prob. Chi-Square(5)	0.392
	Scaled explained SS	4.17488	Prob. Chi-Square(5)	0.5245
UK	F-statistic	1.83031	Prob. F(5,34)	0.1332
	Obs*R-squared	8.48318	Prob. Chi-Square(5)	0.1315
	Scaled explained SS	3.9052	Prob. Chi-Square(5)	0.5631
Germany	F-statistic	4.13821	Prob. F(5,34)	0.4801
	Obs*R-squared	15.133	Prob. Chi-Square(5)	0.3982
	Scaled explained SS	5.41974	Prob. Chi-Square(5)	0.3668

The third assumption of multiple linear regression is the absence of autocorrelation in the model. While discussing the Durbin-Watson statistic which is a measure of autocorrelation in the time series model we found its values near 2 for all the fitted models which always remain in between 0 to 4 (Breusch & Pagan, 1979). A value for this statistic below 2 indicates the presence of positive and above 2 presence of negative autocorrelations in the model (Enders, 2010). Table 4 shows all the Durbin-Watson statistics are under 2 which give a chance of presence of positive autocorrelation in the models. LM test is used for testing the significance of these autocorrelations. Since both the probability values of F and Chi-square tests are greater than 5% for all the models which refer to accept the null hypothesis for the test and conclude that here is no significant autocorrelation among the errors generated by the proposed estimation models.

Table 4: Breusch-Godfrey Serial Correlation LM Test

Turkey	Durbin-Watson statistics	1.74425	F-statistic	12.42654	Prob. F(2,32)	0.1422
			Obs*R-squared	17.04868	Prob. Chi-Square(2)	0.1928
USA	Durbin-Watson statistics	1.82774	F-statistic	45.80896	Prob. F(2,32)	0.435
			Obs*R-squared	29.64551	Prob. Chi-Square(2)	0.536
UK	Durbin-Watson statistics	1.61814	F-statistic	77.195	Prob. F(2,32)	0.1129
			Obs*R-squared	33.13268	Prob. Chi-Square(2)	0.122
Germany	Durbin-Watson statistics	1.9921	F-statistic	21.09744	Prob. F(2,32)	0.678
			Obs*R-squared	22.74814	Prob. Chi-Square(2)	0.711

Note: The first row LM test results are given in the table 4.

The fourth and the last assumption of the multiple linear regression is the absence of Multicollinearity, which is another problem.This may affect the accuracy and the significance of multiple regression model (Hair et al., 2010). It is measured by Variance Inflation Factor (VIF) and if its values appear less than 5 it indicates that there found no significant relation among the residuals and the independent variables(Belsley, 1991). In themodels all the "Centered VIF" values are within the desired limit so we can say that there is no indication

found for the presence of Multicollinearity in the suggested model. Table 5 shows below the VIF values for all the models.

Table 5: Variance Inflation Factors (VIF)

Variables	Turkey	USA	UK	Germany
LIR				
LIR(-1)	1.996655			
LIR(-2)		2.733682		
LUE				
LUE(-1)	2.164424			
LUE(-2)		2.135841	1.187853	4.947508
LD				
LD(-1)	1.795065			
LD(-2)		1.262084	1.437481	1.376236
LP				
LP(-1)				
LP(-2)			0.7928242	0.629424
LGDP				
LGDP(-1)				
LGDP(-2)		2.135051	3.830637	3.232572

The CUSUM examination is a statistical method that assesses the stability of regression relationships over time by utilizing the cumulative sum or sum of squares of recursive residuals. In 1975, Brown et al. developed this test, and Kramer (1986: 3) introduced an alternative variance estimate for disturbances in regression. The CUSUM test displays the cumulative sum with 5% significance lines. Based on the CUSUM test outcomes, the proposed model for the housing index in three countries Turkey, UK and Germany while cumulative sum of squares for USA appear to be accurately formulated. As demonstrated in the figure 2below, the CUSUM test reveals that the model is correctly formulated and that remain unchanged over time.

Figure 2: CUSUM test for Stability
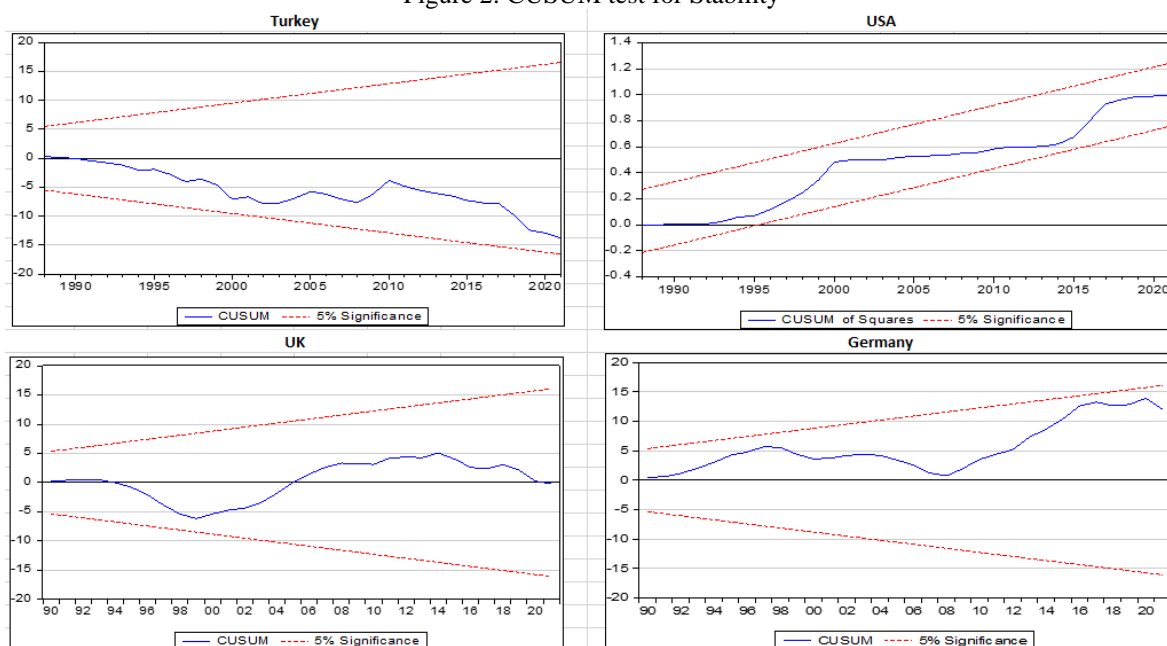
5. Conclusion:

Using housing index as the dependent variable, a multiple linear regression analysis was conducted on the data of housing index, GDP, unemployment and interest rates and public debts for Turkey, the United States, the United Kingdom, and Germany from 1982 to 2021. The log of the variables was used to scale them, and differencing was employed to determine the stationarity of time series.

Multiple linear regression analysis provided housing index results for four distinct nations. For Turkey, the interest rate, unemployment rate, and debt ratio have a statistically significant effect on the housing index, accounting for 73.7% of the variance in the dependent variable. For the United States, GDP, interest rate, unemployment rate, and debt ratio are statistically significant predictors, explaining the dependent variable by 99.53 percent. Additionally, in the United Kingdom, the English GDP, unemployment rate, population, and debt ratio are statistically significant predictors, explaining the dependent variable by 97.58%. In Germany, the English GDP, unemployment rate, population, and debt ratio are statistically significant predictors, accounting for 99.17% of the variance in the dependent variable.

In Turkey, a one-unit increase in interest rate resulted in a 0.01745-unit increase in the housing index, whereas a one-unit increase in public debt resulted in a 0.9514-unit decrease in the target variable, with public debt identified as the housing index's most influential factor. In contrast to Turkey, the US, UK, and German housing indices are most strongly influenced by GDP.

In light of the discussed results, it can be concluded that interest rate, unemployment rate, and debt are the most influential factors for the Turkey housing index, in contrast to the United States, where GDP is also identified as an influential factor. In addition, for the United Kingdom and Germany, the interest rate was found to be an insignificant predictor of the housing index, while GDP and population size were found to be additional predictors. The unemployment rate of the United Kingdom was found to have a negative impact on the housing index, in contrast to other developed and developing countries studied.

The study reveals that Turkey's interest rate, unemployment rate, and debt have positive and negative effects on the housing index. The U.S. housing index is positively influenced by the country's interest rate, unemployment rate, gross domestic product, and debt. The unemployment rate, GDP, population, and debt all have a positive impact on the UK and German housing indexes. In the absence of these factors, the housing indexes for both of these nations are negatively impacted. In other developed countries, where debt was found to have a negative influence, the effect of debt in Turkey differs significantly. The interest rate was discovered to be effective in Turkey and the United States, but insignificant in the United Kingdom and Germany. In developed countries, GDP and population were found to have a significant impact on the housing index, whereas in Turkey and the United States, their impact was negligible. In conclusion, while the housing market in Turkey is generally more affordable than in established nations, housing quality is lower and the market is more volatile. Although Turkey has made efforts to enhance its housing quality, it still has a long way to go before it meets the standards of developed nations.

In light of this study, a number of factors can be attributed to the differences in housing index trends between Turkey and developed nations:

1. Economic Development: Economies in developed nations are typically more established and stable, with higher income levels and more robust institutional structures. As an emerging market, Turkey is susceptible to greater economic volatility and fluctuations, which can affect its housing index. The dynamics of the housing market are heavily influenced by economic factors including GDP growth, employment rates, and income levels.
2. Maturity of the Market: Housing markets in developed nations are typically mature and well-regulated, with established mechanisms for property valuation, mortgage lending, and investor participation. On the other hand, Turkey's housing market may be characterised by emerging regulatory frameworks, varying market practises, and varying investment patterns. These market characteristics can contribute to housing index trends that diverge from one another.
3. Differences in population dynamics, urbanisation rates, and demographic trends between Turkey and developed nations can have an effect on the housing index. Variations in population growth, migration patterns, and household formation rates, for instance, can result in varying demand-supply dynamics and impact housing prices and affordability.
4. The policy and regulatory frameworks governing the housing sector can have a significant impact on the housing index. Generally, developed nations have well-defined policies regarding land use, zoning regulations, urban planning, and initiatives for affordable housing. There may be various policies in force

in Turkey, and variations or inconsistencies in these policies may contribute to fluctuations in the housing index trend.

5. External Factors External factors, such as global economic conditions, geopolitical events, and the dynamics of financial markets, can also influence the housing index in different countries. Due to its position in the global economic landscape, the housing market in Turkey may be more vulnerable to external disruptions or influences.

It is essential to note that these factors interact in complex ways and that multiple factors can contribute to the divergent housing index trends between Turkey and developed nations. To provide more complete and nuanced explanations for the observed differences, it would be necessary to conduct additional research and analysis on the Turkish housing market, economic conditions, and policy landscape.

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