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Research Article

Dynamic links between ADRs and home country macroeconomic indicators: Empirical evidence from Turkey

ADR'ler ile ana ülke makroekonomik göstergeleri arasındaki dinamik bağlantılar: Türkiye'den ampirik kanıtlar

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Abstract

In the U.S. stock market, 17 Turkish companies have their shares dual-listed through American Depositary Receipts (ADRs). The return and dividend performance of these shares is measured by the BNY Mellon Turkey Classic ADR index (BKCTRT). For investors who prefer ADRs for portfolio diversification, the effects of the home country's fundamental economic indicators on the ADR market are a significant issue. This study investigates the impact of changes in Turkey's inflation, real exchange rate, interest rates, and CDS indicators on the BKCTRT index in the U.S. market, as well as the dynamic relationships among them. The Autoregressive Distributed Lag (ARDL) approach was used to analyse relationships among multiple variables. The statistical consistency of the ARDL model was tested for model assumptions, significance, and stability. The ARDL cointegration analysis confirms the long-term cointegration between the variables. In the long term, changes in inflation and the real exchange rate in Turkey have a statistically positive effect on the BKCTR index, while CDS has an adverse effect. The long-term impact of the interest rate variable is statistically insignificant. In the short term, the CDS variable has a statistically significant impact on the BKCTRT index up to two lags. The short-term error term coefficient (ECM) is negative, and the shock effect in the current period is corrected by 18% in the next period. According to the results, changes in Turkey's basic economic indicators affect the U.S. market. Based on the results obtained, investors are advised to consider changes and expectations in Turkey's CDS, real exchange rate, and inflation when making decisions regarding the inclusion or exclusion of Turkey ADRs in their portfolios in the U.S. stock market, as well as when making buy/sell decisions for Turkey Classic (BKCTRT) index options in derivative markets.

Keywords: American Depository Receipts (ADR), Dual Registration, ARDL Model

Jel Codes: G11, G12, G15, G18

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Öz

ABD hisse senedi piyasasında, Amerikan Depo Sertifikası (ADR) yöntemiyle Türkiye menşeli 17 şirket hissesi çifte kayıtlıdır. Bu hisselerin getiri ve temettü performansı BNY Mellon Türkiye Klasik ADR endeksi (BKCTRT) ile ölçülmektedir. Portföy çeşitlendirmesinde ADR'leri tercih edecek yatırımcılar açısından ana ülke temel ekonomik göstergelerinin ADR piyasası üzerindeki etkileri önemli bir konudur. Çalışma ana ülke Tükiye'nin enflasyon, reel döviz kuru, faiz ve CDS göstergelerinde meydana gelen değişimlerin, ABD piyasasındaki Türkiye BKCTRT endeksi üzerinde etkisini ve aralarındaki dinamik ilişkieri araştırmaktadır. Çoklu değişkenler arası ilişkilerin analizinde Otoregresif Dağıtılmış Gecikme Modeli (ARDL) yaklaşımı kullanılmıştır. ARDL modelinin istatistiki tutarlılığı için modelin varsayım sınamaları, anlamlılığı, kararlılığı test edilmiştir. ARDL eş bütünleşme analiz sonuçları değişkenler arasında uzun dönemli eş bütünleşme ilişkisini doğrulamaktadır. Uzun dönemde Türkiye enflasyon ve reel döviz kurundaki değişim BKCTR endeksini istatistiksel olarak pozitif, CDS ise negatif etkilemektedir. Faiz değişkenin uzun dönem etkisi istatistiksel olarak anlamsızdır. Kısa dönemde CDS değişkeni istatistiksel olarak anlamlı BKCTRT endeksini iki gecikmeye kadar etkilemektedir. Kısa dönemde elde edilen hata terimi katsayısı (ECM) negatiftir ve mevcut dönemde yaşanan bir şok etkisi bir sonraki dönemde % 18'i düzeltilmektedir. Sonuçlara göre Türkiye temel ekonomik göstergelerindeki değişimlerden ABD piyasasına doğru bir etki söz konusudur. Elde edilen sonuçlara göre yatırımcılara ABD hisse senedi piyasasında Türkiye ADR'lerini portföye dahil edilmesi ve çıkartılması kararlarında, türev piyasalarda Türkiye Klasik (BKCTRT) endeksi opsiyonu alım satım kararlarında Türkiye'nin CDS, reel döviz kuru ve enflasyondaki değişmeleri ve beklentileri dikkate almaları önerilir.

Anahtar Kelimeler: Amerikan Depo Sertifikaları (ADR), Çift Kayıt, ARDL Modeli

JEL Kodları: G11, G12, G15, G18

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Introduction

Companies register their shares in secondary markets such as the US, London, and Japan, which have high financial depth, to increase liquidity and raise capital due to insufficient demand in domestic markets, or to enhance their visibility. In other words, a company first issues its shares on the domestic stock market and then registers the same shares on the stock market of another country by using them as collateral. This is a type of dual listing method. This method confers prestige on companies and attracts savings from foreign investors into the home country, thereby creating greater demand for the issued shares. From the perspective of investors in the issuing countries, the returns on such shares are handsome. Double-registered shares are traded according to the rules of the stock market where they are registered. They are bought and sold as two separate shares at different prices in different markets. From the perspective of home country firms, they provide the opportunity to secure low-cost capital and expand their capital base by opening up to investors in other countries (Aksoy and Dayı, 2017). Dual-listed shares are affected by economic shocks in the home country, as well as providing high-value equity financing. In the United States, the most widely used dual registration method on the New York Stock Exchange is American Depositary Receipts (ADRs). ADRs are securities issued by a depositary agent in exchange for holding a specified number of shares of the home-country company as collateral (Bodie, Kane and Marcus, 2014). ADRs, in a sense, trade like derivatives whose values are tied to the performance of the underlying company and its shares in the home country (Kabir, Hassan, and Maroney, 2011). Suppose shares are issued in European markets in exchange for depository receipts (EDRs). In that case, they are referred to as global depository receipts (GDRs) when issued for trading in various international markets (Yalçıner, 2012, p. 317). This study argues that there are dynamic links between changes in the home country's economic indicators and Turkey's ADRs.

ADRs are beautiful investment instruments for U.S. investors due to their low tax rates, enabling them to invest in foreign stocks in home country, avoid transaction costs in home country, eliminate the risk of currency depreciation in home country, circumvent legal requirements for profit transfers, and exclude economic, political, and other uncertainties and risks in home country (Wu, Hao and Lu, 2017). ADRs also offer U.S. domestic investors the opportunity for high returns through portfolio diversification. In a portfolio heavily weighted toward U.S. stocks, a deterioration in U.S. economic indicators increases the likelihood of lower returns on U.S. domestic stocks. However, including ADRs from other countries in their portfolios reduces portfolio risk by providing international diversification opportunities (Peterburgsky and Yang, 2011). In this context, emerging market ADRs are practical tools for reducing portfolio risk for domestic investors (Arnold, Nail, and Nixon, 2004).

The time difference between the U.S. market, where ADRs are traded, and the home country creates information transfer and signal effects that, in turn, influence the markets. Due to the global time difference, information is first processed and reflected in prices on the first market to open. Investors in markets that open later take positions in the buy or sell direction based on developments in the previous country. This means, for example, that the impact of a macroeconomic data release or news in the home country (Turkey) on stock prices is reflected in the price formation of stocks in markets that begin trading after the Turkish market. This transmission mechanism enables investors to take positions in subsequent markets by referencing the performance of the previous country's stock market or stocks, such as buying, selling, or waiting and seeing. This situation can lead to speculative movements and unfair gains in stock markets (Aksoy and Dayı, 2017; Freedman, 1991, p. 7). In this context, the study is significant for determining whether this interaction between Turkey and the ADR market is functioning.

In this context, it is essential to monitor macroeconomic developments in home countries to increase portfolio returns and reduce risk. This is because, by their very nature, economies interact through various economic indicators. For example, many economic indicators, such as interest rates, inflation, exchange rates, and CDS indicators, influence one another and affect liquidity. An increase in interest rates can shift liquidity from the stock market to deposits, leading to a decline in stock prices. Conversely, rising inflation, coupled with real interest rates rehomeing below inflation, can increase demand for the stock market, driving up stock prices. Therefore, when including ADRs in their portfolios, investors consider changes in the macroeconomy and indicators of the home country (Gupta, Yuan and Roca, 2016). The theoretical framework outlined above highlights the impact of macroeconomic changes in the home country on ADR price formation and the ADR indices of that country.

The relationship between ADRs and the economic indicators of the home country is complex. For example, the U.S. markets are the deepest in the world. Due to its production capacity and the dollar's status as a reserve currency, the U.S. economy has minimal potential to affect other countries' markets. Under normal circumstances, the prices of ADRs issued in the U.S. capital market are shaped by changes

and uncertainties in the U.S. economy. Therefore, it is expected that economic events and shocks in the home country will not affect the U.S. markets. The literature emphasises that the one-way weak relationship from other national markets to U.S. stock markets distinguishes ADR stock pricing from home-country stock pricing (Gupta et al., 2016). Based on this theoretical framework, it can be concluded that changes in ADR prices are less likely to be driven by the underlying stock or the home country stock market. This complex relationship between the home country and the dual-listed country markets is widely discussed in the literature (Kabir et al., 2011).

Seventeen Turkish companies are dual-listed on both the BIST and U.S. markets through American Depositary Receipts (ADRs). Two indices are published to measure the performance of Turkish ADRs. The first is the Turkey Classic BKCTRT Index, which covers price changes, distributed dividends, and all other distributed income. This index focuses on the overall performance and total return of Turkish ADRs. The second is the Turkey Classic BKCTR Index, which only considers price changes in Turkish ADRs. Investors who aim for long-term investments and total return consider the first index, while those interested in short-term price movements consider the second index. The BKCTRT index, which represents a broader base, was preferred for use in this study. The study aims to examine the relationships among Turkey's interest rates, the real exchange rate, inflation, CDS indicators, and the broadly defined Turkey Classic ADR index (BKCTRT) using the ARDL bounds test. The study may provide evidence on the extent to which investors should consider the macroeconomic variables of the home country. The existing literature focuses on stock returns and macroeconomic variables and does not sufficiently examine the relationship between Turkey CDS indicators and the Turkey ADR index. However, including ADRs in portfolio diversification offers numerous advantages. Therefore, the effects of variables influencing ADRs must be carefully examined. Explaining the variables affecting the classic BKCTRT index in Turkey can inform index option trading decisions in ADRs and derivative markets. Does the effect flow from ADRs to the home country? Or does it originate in the home country and flow to the ADR market? For example, the literature provides evidence that information flows from home-country stocks to ADRs, whereas in primary markets, information flows from the U.S. to Australian stocks (Alaganar and Bhar, 2001).

The study is structured into four sections. First, the theoretical framework of the relationship between the ADR market and the home country is explained with reference to the literature. Next, the methods and methodology used in the study are defined. In the third section, the ARDL bound test analysis and the results obtained are presented. In the fourth section, the assumptions of the ARDL model under examination are tested, and the model's consistency is evaluated. Finally, the discussion section presents the results along with a comprehensive analysis.

Theoretıcal framework and literature review

Portfolios that include ADRs offer local U.S. investors advantageous international diversification opportunities in their own domestic markets. GOÜ ADRs, in particular, provide investors with high returns. A study conducted across 22 developed and emerging markets, using data from March 22, 1996, to June 24, 2011, shows that EM ADRs have the highest returns. However, these countries also exhibit high standard deviation, indicating higher risk (O'Hagan-Luff and Berrill, 2018). ADRs are also highly valuable due to their higher growth potential (Doidge, Karolyi and Stulz, 2004). ADRs are subject to U.S. stock market and accounting standards, and like other U.S. stocks, they pay dividends and trade like local stocks. They protect investors from currency risk because they are issued in U.S. dollars (O'Hagan-Luff and Berrill, 2018). Portfolio theories emphasise that higher returns can be achieved at lower risk levels through international diversification. ADRs issued by multinational companies provide domestic investors with the opportunity to benefit from global diversification in their own countries and achieve their targeted returns at lower risk levels (O'Hagan-Luff and Berrill, 2018).

The number of foreign companies listed as dual-listed (ADR) on the U.S. stock market has been steadily increasing in recent years (Kabir et al., 2011). ADRs reduce capital costs, facilitate companies' access to international markets and resources, and improve their ability to finance with equity. They expand the shareholder base by spreading capital, thereby increasing supply and demand and adding depth to stock pricing. Additionally, they provide extensive information on how ADRs make stocks more liquid, enhance a company's visibility in international markets, confer prestige on the firm, and reduce agency costs (Mittoo, 1992; Fanto and Karmel, 1997; Reese and Weisbach, 2002; Pagano et al., 2002; Doidge et al., 2004). In particular, the adequate representation of developing economies through ADRs contributes to their economic development and the stabilisation of foreign exchange markets (Schaub, 2018). Globalisation in capital markets, increasing specialisation, and the demand for international portfolio diversification by global investors, such as the U.S., are rapidly expanding and deepening the ADR market (Bin, Morris and Chen, 2003). The presence of strong institutions in the U.S. and their success in

reducing governance issues in financial institutions further increases interest in the ADR market (Li et al., 2019). However, using ADRs for portfolio diversification requires investors to closely monitor macroeconomic variables in their home country and global factors, such as oil prices. Lobão and Loureiro (2025) examined the relationship between 23 dual-listed ADRs on the Chinese market and their home-country shares. The study results reveal a long-term equilibrium relationship between the prices of home country shares in China and ADR prices in the United States. It shows that both shares respond to innovations in their own countries and that there is a reciprocal causality relationship between them. The impact-response functions reveal that shocks have an effect within the first 3-5 days and that this effect dissipates over time.

Due to cross-border interactions, macroeconomic statistics published by national and international institutions are attracting increased investor attention. Because such news reaches and interests a larger number of investors, its overall impact on financial markets is also greater (Cheema, Eshraghi and Wang, 2023). This is because investors have limited capacity to process and interpret large amounts of detailed information, leading them to pay closer attention to macroeconomic news releases (Peng and Xiong, 2006). News about companies' dividend distributions, balance sheet disclosures, and investment decisions, however, is of interest to fewer investors, and the lack of interest in company-specific news weakens the potential impact on financial markets as a whole. This theoretical perspective encourages rational investors to seek information about macroeconomic news and shocks that affect the market as a whole rather than company-specific news and shocks (Kacperczyk, Nieuwerburgh and Veldkamp, 2016). To analyse this theory, the relationship between daily stock returns in the U.S. stock market and the days when nine types of macroeconomic data were released was examined for the period 1998-2017. The results of the study emphasise that the day with the fewest macroeconomic data releases is Monday and that stock prices are higher on Mondays in the U.S. market, but this cannot be explained by the Monday anomaly (Cheema et al., 2023). The literature indicates that the stock market is more sensitive to macroeconomic factors. Aharon, Baig and DeLisle (2022a) found that Robinhood account activity increased ADR stock volatility across 33 countries, using data from May 17, 2019, to August 13, 2020. Lee, Chang and Chen (2015) investigated whether ADRs moved in tandem with their home-country or U.S. industry indices in 9 Asian and European countries (China, Hong Kong, Japan, Russia, Singapore, France, Germany, the Netherlands, and the United Kingdom). The study provides evidence that ADR returns are significantly linked to host-country industry returns rather than to those of the United States, and that there is a close financial-market connection between ADR returns and host-country index returns.

Interconnections between financial markets are significant for investors in terms of portfolio diversification and adjusting the balance between portfolio risk and return. In countries with high levels of market integration, economic developments in one country are more likely to be transmitted to stock prices in other countries. In markets with low integration, this transmission is weaker, making such markets more suitable for international diversification. Some studies emphasise that the lack of cointegration between stock markets may result from weak economic integration among the relevant economies (Gilmore and McManus, 2003). For example, a study using weekly stock prices from 2005 to 2023 across Latin American stock markets shows that markets are not fully integrated, except during financial crisis periods. However, temporary long-term relationships exist between specific market indices at times (Rehber, Madonya and Sarwar, 2025).

Over the past thirty years, financial liberalisation and market integration have increased investments through international diversification in the stock market. The study of the effects of market integration and increasing risk factors (exchange rate risk, interest rate risk, inflation risk, and political risk) on markets has attracted the attention of investors and academics. The literature provides evidence that exchange rate risk affects ADRs originating from the United Kingdom, Japan, and South Africa and influences ADR pricing (Liang and Mougoue, 1996). ADRs offer investors the opportunity to invest in foreign stocks in their own country without being affected by these negative factors. A study examining whether ADRs issued by companies in countries such as the United Kingdom, Japan, and South Africa are exposed to exchange rate risk shows that ADR returns are sensitive to fluctuations in the relevant exchange rates. Analyses based on weekly data from 125 ADR-issuing companies in 11 countries across all continents between 1990 and December 2000 reveal that the home-country exchange rates and international interest rates are significant determinants of ADR pricing (Bin et al., 2003). Other studies have examined the relationships among crude oil prices, the money supply, inflation rates, industrial production indices, and stock markets. According to a study examining the relationship between the Chinese and Indian stock markets using monthly data from 1999 to 2009, the money supply was found to hurt the Chinese market, while inflation had a positive effect on both countries' markets (Hosseini, Ahmad and Lai, 2011). Choi and Kim (2000) conducted a study to identify the home determinants

underlying ADR returns for the period 1990-1996. They found that exchange rate changes had very little explanatory power over ADRs, but that GOÜ ADRs were an effective means of international diversification for U.S. investors.

Hauser, Tanchuma and Yaari (2014) examined five Israeli companies listed on both the Tel Aviv Stock Exchange and NASDAQ and found that price causality in dual-listed stocks is unidirectional from the domestic market to the foreign market. In other words, changes in home-country stock prices cause changes in the pricing of dual-listed stocks. The ADR market serves as a broad laboratory for examining the relationships among home-country government interventions, economic indicators, and exchange rates, as well as those in dual-listed markets (Aharon, Baig and DeLisle, 2022b). Doidge et al. (2004) compared the value of foreign firms listed in the U.S. with that of foreign firms not listed in the U.S. The results showed that the Tobin's q ratio for ADRs of US-listed firms was 16.5% higher than that of firms in the same country not listed in the U.S. Based on this, the following question can be asked: Do ADRs perform well because they are traded on the U.S. stock market, or do the macroeconomic indicators of the home country have a positive or negative effect on their performance? The study investigates whether Turkey's inflation, interest rates, real exchange rate, and CDS indicators affect the Turkey ADR index.

This study differs from other studies by incorporating the country CDS indicator, which has been accepted in recent years as a measure of countries' default risk, into the model. Financial theories suggest that investors can borrow at unlimited levels when making investments, but that the cost of borrowing increases with risk once a certain threshold is crossed. In this context, the study contributes to the literature by testing the relationship between CDS indicators and borrowing capacity with stock markets. The ADR market is a continuation of the home country stock market. This assumption implies that home-country stock prices may affect ADR prices, and that indicators such as home-country inflation, real exchange rates, and CDS may also affect ADRs. The literature focuses more on the relationships between home-country stocks and GDP, money supply, inflation, exchange rates, and interest rates, as well as on the relationship between oil prices (Wongbangpo and Sharma, 2002; Mun, 2017). Studies examining the relationships between the home country's fundamental economic variables and the dual-listed ADR market are limited in the literature. This study may help fill this gap in the literature. The literature indicates that changes in macroeconomic indicators of the home country may affect ADRs. Within this scope, the following hypotheses were formulated based on the literature and tested in the empirical analysis section.

H_1: *There is a negative relationship between BKCTRT index returns and CDS premiums.*

H_2: *There is a positive relationship between the BKCTRT index returns and inflation rates.*

H_3: *There is a positive relationship between BKCTRT index returns and the real exchange rate.*

H_4: *There is a positive relationship between the BKCTRT index returns and the interest rate.*

H_5: *There is a long-term cointegration (integration) relationship between Turkey's key macroeconomic indicators (CDS, inflation, real exchange rate, interest rate) and the ADR market.*

Data set, econometric method, and model

The data set covers monthly data from January 2015 to March 2025. In selecting the data period, Turkey pursued a policy of low interest rates, low exchange rates, and high inflation. As a result, the exchange rate, interest rate, and inflation shock all co-occurred during this period. The global pandemic significantly impacted this process. The extended data period and large number of observations increase the consistency of the analysis results in examining long-term relationships. Variables were analysed using their logarithmic values. The data source and variable definitions are presented in Table 1 below. The data for this study were obtained from the publicly available websites listed in Table 1. Ethical committee approval is not required for the use of these data.

Table 1: Variables and Data Sources

Variable	Definition	Data source
Türkeye Classic ADR Index	BKCTRT	https://tr.investing.com/indices/bny-turkey-adr-tr
Inflation	INF	https://evds2.tcmb.gov.tr/index.php?/evds/serieMarket
Real Effective Exchange Rate (CPI-Consumer Price Index-based)	USDTRY	https://evds2.tcmb.gov.tr/index.php?/evds/serieMarket
Credit Default Swaps	CDS	https://tr.investing.com/rates-bonds/turkey-cds-5-year-usd
Interest rate	INTRATE	https://evds2.tcmb.gov.tr/index.php?/evds/serieMarket

This study analyses the effect of Turkey's inflation, CDS, real exchange rate, and interest rate variables on the Turkey Classical ADR index BKCTRT using the Autoregressive Distributed Lag (ARDL) boundary test method. The ARDL bounds test, developed by Pesaran and Shin (1999) and Pesaran, Shin, and Smith (2001), produces consistent long-run coefficients for data with a normal distribution, regardless of whether the variables are I(I) or I(0). In other words, it can be used in all cases except when the variables are I(2). This makes it more advantageous than the Engle and Granger (1987), Johansen (1988), and Johansen and Juselius (1990) cointegration tests, which are dependent on the stationarity condition. The unrestricted error-correction model used in this test has stronger statistical consistency than other cointegration tests (Narayan and Smyth, 2005). Application results are more reliable in small sample sizes (N < 50). In the ARDL model, when the sample size is small, it is recommended to use the critical values calculated by Narayan (2005) for small samples rather than those by Pesaran and Shin (1999) and Pesaran, Shin, and Smith (2001).

Critical values are calculated under the condition that the variables are I(0) and I(I) with 1,000 samples and 40,000 repetitions. Additionally, Pesaran is a preferred method over the VAR (Vector Autoregression) model for time-series analyses that include both internal and external variables, and it is widely used in the literature to examine relationships among multiple variables (Alam and Hossain, 2024). The purpose of this method is to determine whether variables are correlated (cointegrated) with each other in the long term. The null hypothesis (H_0) is that there is no cointegration between the variables. The decision to reject the hypothesis is based on the F-statistic value. If the calculated upper critical value is less than the F statistic value, the null hypothesis is rejected. The H_1 hypothesis, which posits a relationship between the variables, is accepted. The prediction equation established to examine the effects of inflation, exchange rate, interest rate, and CDS variables on the Turkey ADR Index BKCTRT is as follows.

$$BKCTRT_t = \beta_0 + \beta_1 INFt + \beta_2 USDTRY_t + \beta_3 CDS_t + \beta_4 INTRATEt + \mu_t \quad (1)$$

In the Equation, μ represents the error term, t represents time, and β i (i = 0, …,4) represents the estimates. The formulation and indices of the General ARDL econometric model of Equation (1) are as follows.

$$Y_t = \propto_0 + \sum_{i=1}^{p} \propto_i Y_{t-i} + \sum_{j=1}^{q1} \beta_{1j} X_{1,t-j} + \ldots\ldots \sum_{j=1}^{qk} \beta_{kj} X_{k,t-j} + \varepsilon_t \quad (2)$$

From the subscripts: Y_t: dependent variable, $X_{k,t}$: independent variable, ε_t: error term, $p\ ve\ q_k$: lag order. The existence of a cointegration relationship between variables can be determined using Equation (3) below.

$$\begin{aligned} \Delta lnBKCTRT_t = \beta_0 &+ \sum_{i=0}^{m} \beta_1 \Delta lnBKCTRT_{t-i} + \sum_{i=0}^{m} \beta_2 \Delta lnINF_{t-i} \\ &+ \sum_{i=0}^{m} \beta_3 \Delta lnUSDTRY_{t-i} + \sum_{i=1}^{m} \beta_4 \Delta lnCDS_{t-i} \\ &+ \sum_{i=0}^{m} \beta_5 \Delta lnINRATE_{t-i} + \beta_6 \Delta lnBKCTRT_{t-1} + \beta_7 \Delta lnINF_{t-1} \\ &+ \beta_8 \Delta lnUSDTRY_{t-1} + \beta_9 \Delta lnCDS_{t-1} + \beta_{10} \Delta lnINTRATE_{t-1} + \varepsilon_t \end{aligned} \quad (3)$$

Δ denotes the first difference operator, and m represents the optimal lag length. To apply the boundary test in Equation (3), it is necessary to determine the appropriate lag length m. Subsequently, the F statistic is applied to the first-period lags of all variables to test for cointegration. The following hypotheses are tested for this test. The optimal lag value m in the equations is selected using model selection criteria such as the Akaike (AIC) or Schwarz (SIC) information criteria. The model's minimum AIC or SIC indicates the optimal m.

$$H_0 = \beta_6 = \beta_7 = \beta_8 = \beta_9 = \beta_{10} = 0 \quad (4)$$
$$H_1 \neq \beta_6 \neq \beta_7 \neq \beta_8 \neq \beta_9 \neq \beta_{10} \neq 0 \quad (5)$$

The test of the hypothesis of cointegration between variables, with the F-statistic exceeding the calculated upper critical value, indicates the existence of cointegration. In this case, the short-term and long-term relationships and coefficients between variables can be examined. Short-term relationships and short-term coefficients are analysed using an error-correction model. Long-term and short-term coefficients are calculated using equations (6) and (7) below.

$$lnBKCTRT_{\square} = \beta_0 + \sum_{i=1}^{m} \beta_{1i}\, lnBKCTRT_{t-i} + \sum_{i=1}^{n} \beta_{2i}\, lnINF_{t-i} + \sum_{i=1}^{v} \beta_{3i}\, lnUSDTRY_{t-i} + \sum_{i=1}^{q} \beta_{4i}\, lnCDS_{t-i} + \sum_{i=1}^{z} \beta_{5i}\, \Delta lnINTRATE_{t-p} + \varepsilon_t \quad (6)$$

$$lnBKCTRT_{\square} = \beta_0 + \sum_{i=1}^{m} \beta_{1i}\, lnBKCTRT_{t-i} + \sum_{i=1}^{n} \beta_{2i}\, lnINF_{t-i} + \sum_{i=1}^{v} \beta_{3i}\, lnUSDTRY_{t-i} + \sum_{i=1}^{q} \beta_{4i}\, lnCDS_{t-i} + \sum_{i=1}^{z} \beta_{5i}\, \Delta lnINTRATE_{t-i} + \beta_6 ECT_{t-1} \quad (7)$$

In time-series analyses such as the ARDL bounds test approach, lag lengths do not have to be the same across variables and can be selected differently according to equations (6), (7) (m, n, v, q, z). Where m, n, v, q, and z represent the optimal lag lengths for each variable determined by the information criterion (AIC or SIC).

Empirical analyses and findings

Descriptive statistics and time series graphs

Descriptive statistics provide information about the characteristics of data, such as how much it deviates from the mean, its distribution, skewness, and kurtosis. Descriptive statistics for the time series are presented in Table 2.

Table 2: Descriptive Statistics

	BKCTRT	CDS	INF	INTRATE	USDTRY
Mean	841.8722	360.6624	27.83931	18.45366	76.59301
Maximum	1480.460	838.2300	85.51479	52.79000	109.4500
Minimum	417.6500	159.8000	6.565403	7.620000	50.28000
Std. Dev.	272.3357	150.8385	23.83258	13.01778	15.74706
Skewness	0.176047	1.024966	1.016745	1.545538	0.409139
Kurtosis	1.843908	3.574208	2.560329	4.126306	1.930203
Jarque-Bera	7.485158	23.22618	22.18302	55.46951	9.296981
Probability	0.023693	0.000009	0.000015	0.000000	0.009576
Observations	123	123	123	123	123

Table 2 shows that Turkey's CDS value, one of its macroeconomic indicators, ranges from 159.80 to 838.23. The standard deviation is 150.83, representing the highest average and standard deviation. This indicates that Turkey's risk of defaulting on its debts is highly variable. The high standard deviation in the CDS indicator reflects the fragility of Turkey's financial structure. Therefore, there is a high likelihood that this fragility could also affect the value of dual-listed shares abroad. When considering the entire data set of variables, the Jarque-Bera test's p-value of <0.005 indicates that not all variables are normally distributed. At this point, the model's residuals must follow a normal distribution. Another essential point in analysing the relationships between variables is the strength of their correlation. The correlation matrix between variables is presented in Table 3.

Table 3: Correlation Matrix between Variables

	BKCTRT	**CDS**	**INF**	**INTRATE**	**USDTRY**
BKCTRT	1,00				
CDS	-0,85	1,00			
ENF	-0,21	0,53	1,00		
INTRATE	0,10	-0,02	0,60	1,00	
USDTRY	0,62	-0,74	-0,83	-0,45	1,00

Table 3 shows that the CDS indicator, one of the macro variables specific to Turkey, has a high negative correlation with the Turkey BKCTRT index. This means that when CDS indicators increase, the value of ADR shares decreases. Such a correlation also indicates a long-term relationship. The correlation between interest rates and inflation indicators, and the Turkey ADR index BKCTRT, is close to zero, suggesting that these two variables do not have a significant impact on the ADR market. The moderate positive relationship between the Turkey BKCTRT index and exchange rates indicates that the BKCTRT index rises as exchange rates rise.

Stationarity tests (ADF-PP)

In time-series analyses, stationarity tests must be performed to prevent statistical inconsistency and spurious regression. The stationarity of the variables was tested using ADF and PP unit root tests. To use the ARDL model, the dependent variable must be I(I), and the independent variables must be I(0), I(I), or a mixture of both. In other words, the only constraint on stationarity is that the series must not be stationary at the second difference or higher. To determine whether the ARDL model can be applied, it is first necessary to establish whether the series are second-order stationary. The ADF and PP unit root tests for stationarity are presented in Table 4. The Schwarz information criterion was used to determine the lag length in the ADF test.

Table 4: ADF and PP Unit Root Test Results for Variables

ADF Unit Root Test						
At Level		**BKCTRT**	**CDS**	**INF**	**INTRATE**	**USDTRY**
With Constant	t-Statistic	-2.4647	-2.3591	-1.8025	-1.2437	-1.9740
	Prob.	0.1267	0.1556	0.3778	0.6537	0.2979
With Constant & Trend	t-Statistic	-2.0962	-2.3397	-2.6925	-2.8337	-0.8618
	Prob.	0.5424	0.4092	0.2417	0.1884	0.9560
Without Constant & Trend	t-Statistic	-1.2559	-0.7115	-0.8981	-0.0432	-1.5235
	Prob.	0.1916	0.4066	0.3252	0.6664	0.1193
At first difference						
With Constant	t-Statistic	-9.6357	-10.8171	-5.6876	-3.9664	-9.1222
	Prob.	0.0000***	0.0000***	0.0000***	0.0022***	0.0000***
With Constant & Trend	t-Statistic	-9.6887	-10.7974	-5.6705	-4.0098	-9.3718
	Prob.	0.0000***	0.0000***	0.0000***	0.0108**	0.0000***
Without Constant & Trend	t-Statistic	-9.6686	-10.8600	-5.6978	-3.8842	-9.0367
	Prob.	0.0000***	0.0000***	0.0000***	0.0001***	0.0000***
PP Unit Root Test						
At Level		**BKCTRT**	**CDS**	**INF**	**INTRATE**	**USDTRY**
With Constant	t-Statistic	-2.1608	-2.3549	-1.2503	-1.3246	-1.8820
	Prob.	0.2218	0.1568	0.6509	0.6166	0.3398
With Constant & Trend	t-Statistic	-1.7960	-2.3602	-2.0273	-2.1221	-1.0276
	Prob.	0.7009	0.3984	0.5803	0.5280	0.9355
Without Constant & Trend	t-Statistic	-0.4648	0.2353	0.6042	0.6350	-1.1687
	Prob.	0.5121	0.7529	0.8456	0.8521	0.2204
AT first difference						
With Constant	t-Statistic	-9.9094	-11.1111	-6.6303	-6.0747	-7.6821
	Prob.	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
With Constant & Trend	t-Statistic	-10.0459	-11.1530	-6.5716	-6.0658	-8.0991
	Prob.	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
Without Constant & Trend	t-Statistic	-9.9532	-11.1548	-6.6054	-5.9879	-7.6422
	Prob.	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***

Note: * Significant at the 10%; **Significant at the 5%; *** Significant at the 1%

According to the ADF and PP unit root test results, the dependent variable, the BKC_TRT index, is not stationary at the level. All other independent variables follow an I(I) process. According to the ADF unit root test, none of the variables follow an I(II) process, and the necessary conditions for estimating short- and long-term relationships using the ARDL bounds test approach are met. In this study, it is necessary to determine the appropriate lag length to test whether the variables move together in the long term and return to equilibrium. Model selection was based on the AIC information criteria. The AIC information criteria indicate that the most appropriate model is the ARDL(4, 2, 0, 0, 0) (Figure 1). The appropriate lag length for the model was determined to be four based on the AIC.

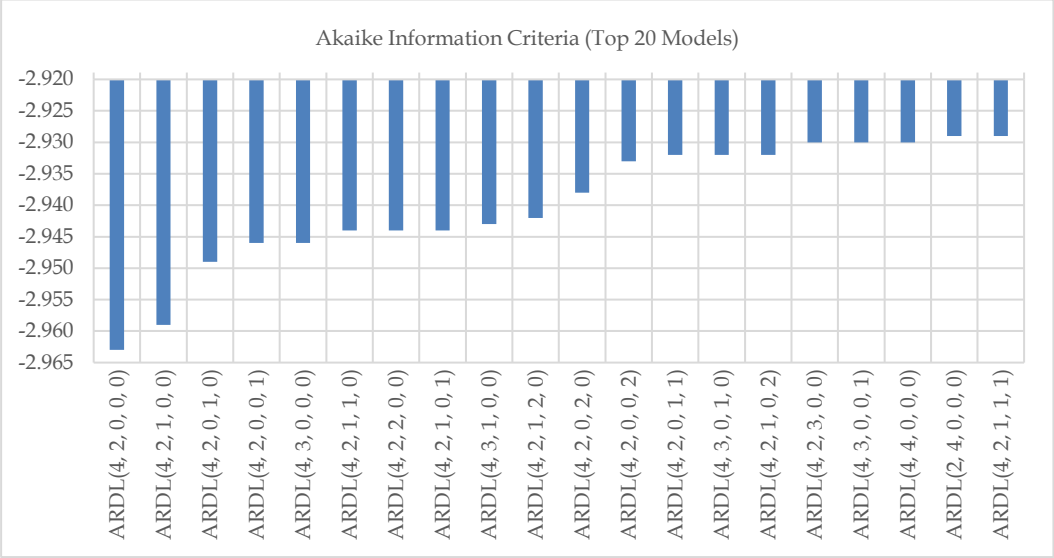

Figure 1: Model Selection according to AIC Criteria

After this stage, it is necessary to determine the cointegration relationship between the variables to examine both long- and short-term relationships. The cointegration relationship between the variables was determined using the ARDL bounds test method. The selected ARDL (4, 2, 0, 0, 0) model has a normal distribution and no autocorrelation or heteroskedasticity problems.

ARDL threshold test analyses

The ARDL boundary test is based on the estimation of F-boundary test values using Equation (3). The null hypothesis of the test is that there is no long-term relationship. This hypothesis is significant when the calculated critical values of I(0) and I(I) are compared with the F-boundary test values. If the calculated upper critical limit values I(I) are smaller than the F-limit test value, the results indicate long-term cointegration; if larger, they indicate the absence of cointegration. Suppose the F-bound test value falls between the calculated lower and upper critical boundary values. In that case, no conclusion can be drawn regarding the presence or absence of cointegration (Pesaran et al., 2001). The summary of the analysis results obtained using the ARDL bound test approach is presented in Table 5.

Table 5: ARDL Bound Test Statistical Values (Cointegration-F-statistic)

	Value	Level of Importance	Lower limit I(0)	Upper limit I(I)
F-statistic	5.197	10%	2.2	3.09
k=	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Table 5 shows the upper-bound critical values for k=4 variables based on the cointegration results. At a 1% statistical significance level, I(I) = 4.37, and the F-statistic value is 5.197. The F-statistic exceeds the calculated upper-bound critical values. Since the F-statistic value is greater than the estimated critical value I(I), the null hypothesis H_0 = there is no cointegration between the variables is rejected. In other words, there is a long-term cointegration relationship between the Turkey BKCTRT index and home-country inflation, the real exchange rate, interest rates, and CDS indicators. The direction and coefficients of the long-term relationship are presented in Table 6. The sign in front of the coefficient indicates the direction of the effect.

Table 6: Long-run Coefficients for the ARDL (4, 2, 0, 0, 0) Model

Variables	Coefficient	Standard error	t-Statistic	Prob.
CDS	-0.566	0.146	-3.871	0.000***
INF	0.479	0.081	5.885	0.000***
INRATE	-0.092	0.074	-1.241	0.2171
USDTRY	1.465	0.359	4.071	0.000***

Note: * Significant at the 10%; **Significant at the 5%; *** Significant at the 1%,

When examining the coefficients in Table 6, where BKCTRT is the dependent variable, the variables CDS, INF, and USDTRY are statistically significant at the 1% level. The results indicate that changes in Turkish markets and economic conditions affect the US ADR market. At the variable level, a 1% change in the CDS indicator is associated with a 0.56% decrease in the Turkey BKCTRT index. A 1% change in inflation in Turkey causes a 0.47% increase in the Turkey BKCTRT index. A 1% change in interest rates in Turkey results in a minimal 0.09% decrease in the BKCTRT index; however, this effect is not statistically significant. A 1% change in the real exchange rate in Turkey causes a 1.46% increase in the BKCTRT index. After analysing the long-term coefficients, the short-term relationship between the variables can be explained using the ARDL error correction model. The ARDL error correction model estimation results are presented in Table 7.

Table 7: Error Correction Model Results for the (4, 2, 0, 0, 0) Model

Variables	Coefficient	Standard error	t-Statistic	Prob.
D(BKCTRT(-1))	-0.164	0.078	-2.102	0.037**
D(BKCTRT(-2))	0.080	0.047	1.708	0.090*
D(BKCTRT(-3))	-0.126	0.047	-2.672	0.008*
D(CDS)	-0.560	0.032	-17.37	0.000***
D(CDS(-1))	-0.165	0.053	-3.080	0.002**
ECM (-1)*	-0.181	0.031	-5.712	0.000***

Note: * Significant at the 10%; **Significant at the 5%; *** Significant at the 1%,

Table 7 shows that the ECM error term, which indicates whether the model reaches equilibrium in the short term, is $p<0.05$, and its coefficient is -0.181, which is negative. This result reveals that the deviations that occurred during the study period are corrected in subsequent periods. The ECM error term coefficient indicates that, in the event of a shock in the current period, 18% of the shock effect is corrected in the subsequent period. In other words, 18% of the deviation that occurred in the previous period (t-1) is corrected in the subsequent period (t).

Diagnostic tests for the econometric ARDL model

When using the ARDL model to analyse cointegration between variables, it is necessary to test for model significance, autocorrelation, normality, and heteroskedasticity to ensure robust and consistent statistical inferences. The model was tested for autocorrelation using the LM test statistic, for heteroskedasticity using the Breusch-Pagan-Godfrey test, for model specification errors using the Ramsey Reset test, and for normality using the Jarque-Bera approximation. The results and explanations of the model's diagnostic tests are presented in Table 8.

Table 8: Diagnostic Tests, Explanatory Power, and Significance of the Model (Model ARDL (4, 2, 0, 0, 0)

Diagnostic tests	Statistical Value	Prob.	Basic hypothesis and conclusion
Breusch-Godfrey LM test for autocorrelation	0.424809	0.827	H_0: No serial correlation, $p>0.005$ H_0 cannot be rejected; therefore, there is no serial correlation.
Breusch-Pagan-Godfrey Test for Heteroscedasticity	7.555110	0.672	H_0: There is no change in variance since $p>0.005$, therefore H_0 cannot be rejected. The model has constant variance.
Ramsey RESET Test	0.471	0.493	H_0: There are no omitted variables in the model. H_0 cannot be rejected since $p>0.005$, and there are no misidentified variables in the model. There are no model specification errors. The established model is statistically significant.
Normal distribution (Jarque-Bera)	0.05	0.974	H_0: The series exhibits a normal distribution. The model's error terms are normally distributed. $p>0.05$ H_0 cannot be rejected. The model's error terms follow a normal distribution.
Explanatory power and meaningfulness of the model	R2 =0.74	F-statistic= 512.91 p=0.0000	The adjusted R^2 value of the model indicates that the selected variables explain 74% of the variation in the Turkey ADR BKCTRT index. According to the F-statistic, the model is statistically significant at the 1% level.

Table 8 shows that there is no autocorrelation problem, no changing variance, and no omitted variables in the model. The series is normally distributed, and the model's explanatory power is sufficient.

Model strength tests (Structural breakage test)

In this study, the Cusum and Cusum of Squares approaches were used to assess the model's stability and to determine whether a structural break occurred (Brown, Durbin and Evans, 1975). In the presence of a structural break, the sum of squared errors of the model increases, leading to statistical inconsistencies. While the Cusum test is based on accumulated residuals, the Cusum of squares test is based on cumulative residuals and also detects changes in the system and in regression coefficients. Since the Cusum of squares test is based on the calculation of consecutive residuals, it is more sensitive than the Cusum test. The test's diagnosis, as shown in the graph below, indicates that if the home trend line (blue) rehomes between the straight lines (orange) at the edges at a 5% statistical significance level, the model being investigated is stable; if it moves outside this range, it is unstable.

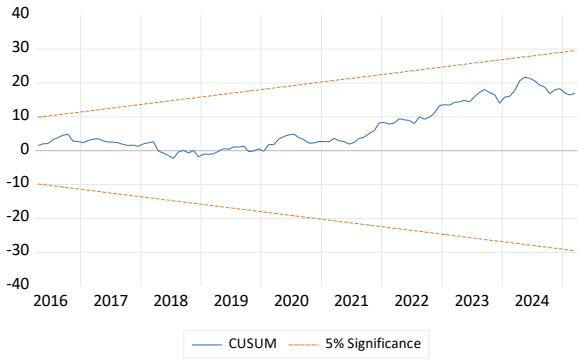

Figure 2: Cusum Determinance Test

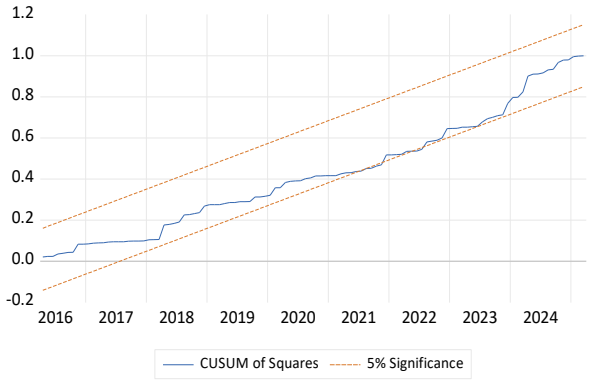

Figure 3: Cusum of Squares Stability Test

In both figures, all residuals rehome within the threshold lines (orange) of the Cusum and Cusum of squares tests at the 5% significance level. This confirms the stability of the regression coefficients and the model at the 5% significance level. The absence of observations outside the critical limits at the 5% significance level indicates that there is no structural break in the model, that the error terms are stationary, that the series in the model are statistically significant for ARDL cointegration analysis, and that statistical consistency and reliability are robust.

Discussion

ADR shares are issued as the equivalent of a specific number of shares in the home country, and, in theory, the price of an ADR is expected to move in tandem with the home-country share. However, in practice, ADR prices show deviations due to cross-market differences (Lee et al., 2015). Local economic indicators and the home-country share price mainly influence ADR share prices. Furthermore, the view that there are strong dynamic links between ADR share prices and home country economic fundamentals in both the long and short term is prevalent in the literature, and there is strong evidence to support this (Yalçın, Sezal, Korkmaz and Yenice, 2025). In this context, macroeconomic statistics have a significant impact on financial markets (Cheema et al., 2023). Investors are therefore more sensitive to macroeconomic statistics news (Kacperczyk et al., 2016). In portfolio diversification and ADR stock selection, it has become crucial to understand and predict the long- and short-term relationships between ADR markets and macroeconomic indicators specific to the home country. Cheema et al. (2023), in their study of the U.S. stock market, found that stock returns were higher on days when macroeconomic indicators were least disclosed. Another study found that Chinese ADRs generally respond more to macroeconomic developments in the U.S. than to influences in their own countries (Burdekin and Zhang, 2018). The results of a study on BRIC countries (Brazil, Russia, India, and China) show that ADR prices and the home country's economic growth positively affect ADR returns in the long term in Brazil and China, while negatively affecting them in Russia and India. In the short term, it was concluded that economic growth and the money supply affect ADR prices across all countries (Gupta et al., 2016). The literature indicates that explaining the dynamic relationship between ADR shares and the macroeconomic variables of the home country is significant in portfolio selection decisions.

Portfolio investors take positions by predicting future values of key variables in their home countries when selecting ADR stocks. A study of selected Asian and European countries shows a strong relationship between ADR returns and home-country industry returns. This is attributed to the strong financial integration between the ADR market and the home country's financial market (Lee et al., 2015).

In this context, one indicator followed by international portfolio managers is the CDS indicator. ADR investors perceive deterioration in CDS indicators as a negative signal about the home country. Particularly in emerging markets, the debt burden of the public and private sectors reflects the country's total external debt stock and increases the country's CDS indicator. Deterioration in the CDS indicator is interpreted as an increase in default risk, the probability of default, and financial fragility (Augustin, Chernov and Song, 2020).

Credit default swaps (CDS) are financial derivatives developed to protect lenders from credit risk. The principle behind a CDS is that, in the event of a default on a debt, the CDS seller compensates the CDS buyer for the unpaid debt in exchange for a specific commission. In the market, lenders (banks and other financial institutions) typically act as CDS buyers, while insurance companies act as CDS sellers. Banks purchase CDSs to protect themselves against the default risk of the loans they issue. Insurance companies, on the other hand, spread their risk by selling CDS contracts to multiple buyers (Gu et al., 2024). CDSs are reasonably priced in a fully competitive credit market. As countries increase their borrowing, the risk of default rises, driving CDS premiums higher. This negative information is reflected in the stock market, leading to a decline in stock prices. Due to market integration, declines in Turkish stock prices negatively affect the pricing of Turkey-based dual-listed ADRs, thereby lowering the BKCTRT index, which measures the prices and performance of Turkey-related ADRs. The study findings, consistent with the theoretical approach, show that a 1% increase in Turkey's CDS indicators reduces Turkey's BKCTRT index by 0.56%, thereby confirming Hypothesis H_1.

Another macroeconomic variable is Turkey's inflation indicator. Inflation causes part of the liquidity to shift to the stock market. The reason for this is that investors want to protect their savings from the erosive effects of inflation. Liquidity entering the stock market through this channel positively affects market pricing by stimulating demand for shares. Consequently, positive movements in home-country stock prices affect the pricing of Turkish ADRs through the time difference between markets and the signal effect. The findings confirm the H_2 hypothesis of a positive relationship between Turkish inflation rates and the BKCT index. In other words, the findings are consistent with the theoretical knowledge that liquidity will shift to the stock market under high inflation conditions and that the stock market will rise due to the resulting demand. Compared to the literature, the findings are consistent with those from studies on the Indian and Chinese markets, which show that inflation has a positive effect on the stock markets of both countries (Hosseini et al., 2011).

Another variable affecting the stock market is exchange rates. Changes in the home country's exchange rates are reflected in the ADR market through portfolio channel capital movements. The findings that the restrictions imposed by the Argentine government on capital outflows during the transition period from December 1, 2001, to January 11, 2002, caused the dollar-denominated price of Argentine ADR shares to fall immediately relative to the peso-denominated price of shares in Argentina powerfully demonstrate the relationship between exchange rates and ADR shares (Kadiyala and Kadiyala, 2004). Exchange rates are critical for foreign investors when entering and exiting the country. Foreign investors generally prefer to enter the country at a high exchange rate and exit at a low rate. An increase in exchange rates encourages foreign currency inflows into the country. Part of the liquidity entering the country stimulates share prices through the portfolio investment channel. The rise in demand for home-country stock prices is expected to positively affect the pricing of Turkish ADRs, driven by time-zone differences and market integration. This approach confirms hypothesis H_3: a positive and significant relationship between the BKCTRT index and the real exchange rate, as established in the literature. The results support the literature's findings that exchange rate risk affects UK, Japanese, and South African ADRs (Liang and Mougoue, 1996). Furthermore, they are consistent with the findings of Bae, Kwon, and Li (2008) regarding the relationship between exchange rates in France, Japan, the United Kingdom, and Australia and ADR stock returns, which show that ADR returns are significantly positively related to exchange rate changes for all four countries. However, it partially supports the findings of Choi and Kim (2000) that the explanatory power of exchange rate changes on ADRs is very weak.

In countries with high cross-market integration, the likelihood of an economic or financial shock in one country affecting another is high. Weak cointegration among countries' key economic and financial indicators indicates weak cross-market integration (Gilmore and McManus, 2003). ARDL cointegration results reveal a strong cointegration relationship between Turkey's macroeconomic indicators and the ADR market. In other words, changes in Turkey's inflation, exchange rate, and CDS indicators affect Turkey-related dual-listed shares in the ADR market. The findings confirm hypothesis H_5: a long-term cointegration (integration) relationship exists between Turkey's key macroeconomic indicators (CDS, inflation, real exchange rate, interest rate) and the ADR market. The results of this study are consistent with those of Hauser et al. (2014), which indicate that price causality in the shares of five dual-listed

Israeli companies traded on the Tel Aviv Stock Exchange and NASDAQ is unidirectional, from the domestic to the foreign market. However, they do not coincide with the findings that there is no volatility spillover from the Turkish stock market to the U.S., UK, German, French, Chinese, Brazilian, and Greek stock markets (Mutlu, Aktaş and Kayalıdere 2023). This inconsistency may stem from the selection of the BIST 30 index and its limited impact on other major markets compared to the macroeconomic variables considered in the study. Despite the strong intermarket relationship, the test result for H_4: There is a positive relationship between the BKCTRT index and the home country interest rate is statistically insignificant. The fact that the Central Bank of Turkey set interest rates in line with government policies rather than market conditions during the period analysed may explain this inconsistency.

Extreme fluctuations in macroeconomic indicators have a high potential to cause panic in stock markets. Among these indicators, inflation, exchange rates, and interest rates are guided and controlled by central banks, the institutions responsible for monetary policy decisions. Central banks can guide macroeconomic indicators such as interest rates and exchange rates, impose restrictions, and allow fluctuations within a specific range to ensure price and financial stability. However, they have no power to intervene in or influence CDS indicators. Lowering the CDS indicator requires reducing the country's overall debt burden. The reduction of companies' external debt burden can be achieved through financing with equity capital rather than borrowing. Based on this, governments or policymakers can use increasing the tax rates applied to dividend (profit-sharing) income as a policy tool to encourage companies to retain their profits.

Conclusion

The study analyses the short- and long-term relationship between the ADR stock market and the home country's CDS premium, inflation, interest rates, and real exchange rate. According to the analysis results, a 1% increase in Turkey's home country CDS indicators reduces Turkey's BKCTRT index by 0.56%. This result confirms the hypothesis of a negative relationship between BKCTRT index returns and CDS premiums. In other words, an increase in CDS, which is an indicator of Turkey's risk of defaulting on its debts, causes a decline in the BKCTRT index in U.S. markets. The findings support studies (Yalçın et al., 2025; Cheema et al., 2023; Burdekin and Zhang, 2018; Gupta et al., 2016) that show strong relationships between key macroeconomic indicators for countries and the ADR market.

The inflation rate and real exchange rate in Turkey positively affect the BKCTRT index of the dual-registered country, the United States. A 1% increase in the real exchange rate causes a 1.45% increase in Turkey's BKCTRT index, while a 1% increase in the inflation rate causes a 0.47% increase in the BKCTR index. The results are consistent with our hypotheses and the literature (Liang and Mougoue, 1996; Choi and Kim, 2000; Hosseini, Ahmad, and Lai, 2011) that there is a positive relationship between the BKCTRT index and inflation rates and a positive relationship between the BKCTRT index and the real exchange rate. The study provides firm, consistent evidence that Turkey's CDS premium, real exchange rates, and inflation rates affect capital markets and, through market integration, ADR stock pricing.

The moderate cointegration between Turkey's inflation, exchange rate, CDS spread, and interest rate indicators, and the ADR index indicates that financial integration has been achieved between the two countries' markets and that shocks in Turkey's key indicators have spillover effects on the ADR market. This integration confirms the hypothesis that there is a long-term cointegration (integration) relationship between Turkey's key macroeconomic indicators (CDS, inflation, real exchange rate) and the ADR market, excluding the interest rate variable. The findings are inconsistent with the hypothesis that there is a positive relationship between the BKCTRT index returns and the interest rate.

The findings contribute to the literature by examining and explaining the relationships between the macroeconomic indicators of the home country and the ADR market, and serve as a laboratory. When investors wish to include Turkish ADRs in their portfolio diversification in U.S. markets within the framework of the findings, they should monitor and carefully follow potential shocks and changes in Turkey's CDS premium, inflation, and real exchange rates. Assuming other conditions remain constant, when signals of an increase in Turkey's CDS premium are received, taking short positions in Turkish ADRs will help reduce portfolio risk and losses. When a signal or expectation indicates an increase in inflation and exchange rates in Turkey, or when expectations are formed in this direction, they can maximise the portfolio's short-term return by including Turkish ADRs.

The study provides a forecast of market integration in Turkey, based on macroeconomic variables, and its use in international portfolio diversification. Conducting similar studies on ADRs and macroeconomic variables across different countries has high potential to inform international diversification decisions and market timing strategies in the ADR market by revealing portfolio

diversification strategies and long- and short-term relationships among stock markets. The study only covers variables specific to Turkey. The ADR market is highly developed and deep. In future studies, including variables such as ADR indices of Developed Countries, Emerging Countries, and Fragile Five countries, uncertainty indices of leading countries, expansion in monetary bases, and fear indices, and conducting different studies on different country groups using methods such as panel data analysis and VAR analysis will contribute to explaining the dynamic market relationships between the ADR market and the leading country.

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