

## ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

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# UNRAVELING MARKET EFFICIENCY THROUGH BANK STOCK RETURNS INSIGHTS FROM SYNDICATED LOAN ANNOUNCEMENTS IN BORSA İSTANBUL

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**ABSTRACT**

This study explores the effect of syndicated loan announcements on the stock returns of banks listed on Borsa Istanbul, utilizing the event study methodology over the 2017–2022 period. Eight publicly traded banks were analyzed to assess abnormal returns (AR), average abnormal returns (AAR), and cumulative abnormal returns (CAR) within an extensive event window. The findings reveal that syndicated loan announcements did not result in statistically significant abnormal returns, indicating a deviation from the semi-strong form of market efficiency in Borsa Istanbul. Unlike previous studies, this research makes an original contribution by focusing specifically on syndicated loan events in an emerging market context, applying a longer observation window and a rigorous empirical setup. By isolating bank-specific stock reactions to syndicated loans, the study enhances the understanding of informational efficiency in developing capital markets. Moreover, it addresses an underexplored topic in Turkish financial literature, offering new insights for investors, policymakers, and academics interested in market behavior and external financing announcements.

Key Words: Event Study, Syndication Credit, Abnormal Returns, AAR, CAR

Jel Codes: G29, G14, E51, E59

## BANKA HİSSE SENEDİ GETİRİLERİ ÜZERİNDEN PİYASA ETKİNLİĞİNİN ÇÖZÜMLENMESİ: BORSA İSTANBUL'DAKİ SENDİKASYON KREDİSİ DUYURULARINDAN BULGULAR

**ÖZ**

Bu çalışma, sendikasyon kredisi duyurularının Borsa İstanbul'da işlem gören bankaların hisse senedi getirileri üzerindeki etkisini 2017-2022 dönemi için olay çalışması metodolojisini kullanarak araştırmaktadır. Halka açık sekiz banka, geniş bir olay penceresi içinde anormal getirileri (AR), ortalama anormal getirileri (AAR) ve kümülatif anormal getirileri (CAR) değerlendirmek için analiz edilmiştir. Bulgular, sendikasyon kredisi duyurularının istatistiksel olarak anlamlı anormal getirilere yol açmadığını ve Borsa İstanbul'da piyasa etkinliğinin yarı güçlü formundan bir sapmaya işaret ettiğini ortaya koymaktadır. Önceki çalışmalardan farklı olarak bu araştırma, özellikle gelişmekte olan bir piyasa bağlamında sendikasyon kredisi olaylarına odaklanarak, daha uzun bir gözlem penceresi ve titiz bir ampirik kurulum uygulayarak özgün bir katkı sağlamaktadır. Sendikasyon kredilerine bankalara özgü hisse senedi tepkilerini izole ederek, çalışma geliştirmekte olan sermaye piyasalarında bilgi etkinliğinin anlaşılmasını geliştirmektedir. Ayrıca, Türk finans literatüründe yeterince araştırılmamış bir konuyu ele alarak, piyasa davranışı ve dış finansman duyuruları ile ilgilenen yatırımcılar, politika yapımcılar ve akademisyenler için yeni içgörüler sunmaktadır.

Anahtar Kelimeler: Olay Çalışması, Sendikasyon Kredisi, Anormal Getiriler, Genişletilmiş Anormal Getiriler (AAR), Kümülatif Anormal Getiriler (CAR)

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## INTRODUCTION

In modern financial markets, the rapid and transparent dissemination of information is critical for maintaining investor confidence, market stability, and overall economic efficiency. Information asymmetry, where certain investors have access to superior information compared to others, undermines the integrity of capital markets (Akerlof, 1970: 490). Financial disclosures, particularly those related to external financing activities such as syndicated loans, provide vital insights into a firm's financial health and future prospects.

Syndicated loans represent a major source of external funding, especially for banks operating in emerging economies, where domestic credit markets may not always satisfy large-scale financing needs (Megginson et al., 1995: 461). Given their size, complexity, and involvement of international financial institutions, syndicated loan announcements can potentially signal crucial information regarding a bank's creditworthiness and operational stability to investors. Therefore, analyzing market reactions to such announcements provides a valuable lens to evaluate the semi-strong form of market efficiency.

Previous research has primarily focused on the structural characteristics and pricing mechanisms of syndicated loans, with limited exploration of their direct impact on borrower stock returns (James, 1987; Gasbarro et al., 2004). Moreover, existing studies (e.g., James, 1987; Gasbarro et al., 2004; Huang et al., 2024) have largely concentrated on developed markets, leaving a gap in understanding how syndicated loan disclosures affect stock prices in emerging markets like Türkiye.

This study aims to fill this gap by investigating the effect of syndicated loan announcements on the stock returns of banks listed on Borsa Istanbul. Unlike prior research, this study applies a comprehensive event study methodology with an extended observation window, covering the 2017–2022 period. By isolating stock price reactions to syndicated loan announcements, the research contributes to the ongoing debate about market efficiency in developing economies and offers insights for investors, policymakers, and academics.

### 1. Literature Review and Contribution of the Research

The literature examining the impact of bank loan announcements on stock returns has long recognized loans as signals of firm quality and financial strength (James, 1987: 218). However, the research specifically targeting syndicated loans remains relatively limited, particularly in emerging markets. Syndicated loans, involving multiple lenders and often complex structures, have unique information content that may not mirror traditional bilateral loans (Gasbarro, et al., 2004: 136).

Early studies in developed markets found that syndicated loan announcements could elicit positive abnormal returns under certain conditions, reflecting market perception of improved borrower credibility (Preece and Mullineaux, 1994: 194). Billett, et al. (1995) found no significant difference in the reaction based on borrower characteristics, suggesting a complex interplay of factors. Similarly, Fields et al. (2006) and Fery et al. (2003) underlined the diminishing impact of loan announcements over time due to increased banking sector competition.

Recent studies have shifted attention towards emerging economies and the post-crisis banking environment. Huang et al. (2024) demonstrated that syndicated loans contribute to risk-sharing and stability for banks post-financial crises. Chen and Wu (2021) specifically analyzed syndicated loan announcements in emerging markets, showing that information asymmetry remains a significant barrier to effective market reactions.

Ferguson and Lam (2023) investigated the cross-border dimensions of syndicated lending and emphasized that international syndicates further complicate investor interpretations in emerging markets. Aldasoro et al. (2022) found that syndicated loans with larger syndicate sizes reduce information asymmetry and hence positively affect stock returns.

Banking sector transparency also plays a crucial role in the pricing and perception of syndicated loans. Belousov (2021) highlighted that greater transparency in banking sectors significantly improves market reactions to external financing announcements. Similarly, Benincasa (2021) found that financial development and deeper banking sectors enhance the effectiveness of syndicated loans in supporting economic growth, particularly in countries like Türkiye.

Furthermore, recent attention has been given to non-financial dimensions. Huang et al. (2024) emphasized that environmental, social, and governance (ESG) risks are increasingly priced into syndicated loan spreads, affecting borrower stock reactions. Caporale et al. (2018) explored borrower performance after syndicated loans and found significant differences between emerging and developed markets, reinforcing the importance of local financial infrastructure.

In the Turkish context, studies such as Çukur, Eryiğit and Duran (2008) identified positive but modest abnormal returns around loan announcements. However, these analyses often did not account for differences in loan structure, syndicate composition, or post-2017 regulatory changes. Sarigül (2015) found weak stock market responses, suggesting that market inefficiency remains a persistent feature.

This study distinguishes itself by focusing specifically on the post-2017 period, capturing new dynamics in Türkiye's banking and regulatory environment. By applying an extended event window and robust abnormal return calculations, it addresses gaps left by previous research. Furthermore, by incorporating insights from ESG and transparency literature into the analysis, it enhances understanding of how broader institutional factors interact with syndicated loan information signals. In doing so, the study not only updates but also significantly extends the existing literature on syndicated loans and market efficiency in emerging economies.

## 2. Syndicated Loans And Process

As elucidated by Apak (1995), a syndicated loan is a financial arrangement facilitated by two or more lending institutions jointly extending a substantial amount of funds to a requestor. This collaborative endeavor involves the utilization of common documentation and a designated common agent, typically referred to as the lead bank, which administers the loan. While common documentation serves as a cohesive framework for the consortium within the loan, variances may exist in the terms and conditions of the participating lenders.

The composition of syndicated loans incorporates three fundamental elements: base (reference) interest, margin (spread), and charges/commissions. Syndicated loans are characterized as financial instruments that amalgamate the features of relationship banking and transaction-based financial instruments (Dennis and Mullineaux, 2000: 404-426). This type of financial instrument provides a mechanism for diverse financial institutions to mitigate and distribute credit risk without being encumbered by obligations, such as public announcements and marketing, which are typical in bond issuances.

Two principal characteristics distinguish syndicated loans from other loan types. First, multiple lenders participate in the transaction and each lender assumes responsibility for underwriting a specific fraction of the total amount with a distinct and separable obligation. Second, syndication participants are not legally liable if other participants fail to fulfill their obligations (Casolaro et al., 2004). Maturities of syndicated loans tend to be medium term, typically ranging from one to five years, occasionally commencing from three months, and extending up to 20 years. Unlike the fixed-rate financial instruments prevalent in the debt market, variable interest rates are commonly applied in syndicated loans at regular intervals (Agarwal, 2021).

Syndicated loans are designed to accommodate funding needs beyond the capacities or preferences of individual banks. While there is no fixed upper limit for each participating bank, it generally varies based on factors such as the resource characteristics of the lender and the creditworthiness of the borrower. This flexible approach allows for the distribution of credit risk among participating banks, particularly in the case of long-term and substantial funding

requirements. Syndicated loans, therefore, exhibit significant flexibility, as they are shaped and tailored according to the specific needs of the borrower, considering the sensitivities and preferences of the participating lenders. In this respect, syndicated loans represent a hybrid of private and public debt.

The syndication process spans the collection of proposals to the signing ceremony. Initiated either by borrower-seeking proposals from various banks or banks proactively offering syndication to identified customers, the process involves evaluating the most suitable proposal. Two types of offers can be presented to the fund requester during this stage (Campbell and Weaver, 2013).

**Base (Reference) Interest:** This pertains to borrowing costs such as the London Interbank Offered Rate (LIBOR), representing the interest rate at which banks lend to each other in US dollars in major financial centers. Following the LIBOR manipulation scandal revealed in 2012, global financial markets have transitioned away from LIBOR-based benchmarks towards alternative reference rates. These include the Secured Overnight Financing Rate (SOFR) for the United States, the Euro Short-Term Rate (€STR) for the Eurozone, the Sterling Overnight Index Average (SONIA) for the United Kingdom, and TRLIBOR or TLREF for Türkiye. Syndicated loan agreements today commonly reference these alternative rates depending on the currency denomination and jurisdiction of the loan. Repayment occurs either at the end of the term or at specified intervals contingent upon the terms of the agreement.

**Margin (spread):** This element reflects variables related to the borrower's risk, country, and funding costs of creditors. It functions as a premium on base interest and may be subject to change at the end of each interest period.

**Expenses and Commissions:** These include fees such as regulation, commitment, participation, transaction, and attorney fees. The nature and amount of these fees are contingent on the type of transaction and the position of the banks in the syndication.

### 3. Pros And Cons Of Syndicated Loans

Syndicated loans, while offering notable advantages, such as meeting extensive financing needs from a single source, are also recognized for their cost-effectiveness, contract flexibility, and streamlined credit procedures. They serve as a convenient and expeditious avenue for securing loans from international finance sources, establishing themselves as an indispensable financing tool for banks and various institutions that require funding. However, the use of syndicated loans has various advantages and disadvantages for both the lending and borrowing parties.

One of the primary advantages of lenders is the diversification of risk within a loan portfolio. Additionally, lending banks often earn commissions when issuing syndicated loans to their clients. From the borrower's perspective, a crucial advantage is the ability to secure a substantial loan amount, which might be challenging to obtain from a single bank. Syndication enables the borrower to swiftly meet significant financing needs by managing a single large liability rather than grappling with multiple debts that could potentially have conflicting maturity dates. The borrower also avoids the risk of disruption to ongoing activities due to the infusion of the loan. Through syndication, borrowers gain access to a diverse group of banks, including those unfamiliar with the borrower, which may result in more favorable lending terms.

However, there are disadvantages to syndication, particularly for banks. The expansion of the international loan portfolio and its connection to various variables related to the borrowing country or institution pose challenges in conducting comprehensive credit analysis. Another concern is the potential for crises in international markets, leading to non-repayment of loans extended by banks. Additionally, the approval of loans, determination of country or institution limits, and the assessment of creditworthiness involve intricate and complex processes. Tax regulations and fund cuts on loans, which are disadvantageous to borrowers, contribute to increased costs. Lenders may also incur additional liabilities beyond interests and commissions, further complicating the lending landscape.

#### 4. Syndicated Loans In The Turkish Banking Sector

Syndicated loans have played a critical role in the Turkish banking sector's external financing structure, particularly since the liberalization of foreign exchange regulations in the 1980s (Yılmaz, 2003: 146). Turkish banks, especially large-scale private and state-owned entities, have increasingly relied on syndicated loans to fund international trade, corporate lending, and liquidity management operations.

Following the 2001 financial crisis, the restructuring of the Turkish banking sector enhanced banks' access to global financial markets (Sarigül, 2015: 117). This reform wave facilitated the steady increase of syndicated borrowing, especially during periods of domestic economic volatility.

Recent data from the Banking Regulation and Supervision Agency (BDDK) and Borsa Istanbul Public Disclosure Platform (KAP) reveal that syndicated loan volumes have continued to fluctuate between 2020 and 2024 due to global economic conditions, geopolitical tensions, and domestic monetary policies. Table 1 below summarizes the trends observed in syndicated loan volumes for Turkish banks in recent years.

**Table 1. Syndicated Loan Volumes in the Turkish Banking Sector (2020–2024)**

Year	Total Syndicated Loans (USD Million)	Annual Growth (%)
2020	16,800	–
2021	18,100	+7.7%
2022	19,300	+6.6%
2023	20,700	+7.3%
2024 (Estimated)	21,800	+5.3%

Source: BDDK (2024), KAP (2024).

Despite the positive trend in nominal syndicated loan volumes, Turkish banks have faced significant challenges, including rising borrowing costs, shorter loan maturities, and more stringent syndicate structures. These developments stem from both the tightening of global financial conditions and Türkiye's heightened country risk premiums during certain periods.

Moreover, ESG (Environmental, Social, and Governance) factors have increasingly influenced syndicated lending decisions, especially among European and American lenders participating in Turkish syndications. This evolution has added new dimensions to the assessment of Turkish banks' international borrowing profiles.

In sum, while syndicated loans remain a vital lifeline for Turkish banks, market dynamics have become more complex. Banks' ability to maintain and roll over syndicated facilities continues to serve as a critical indicator of financial resilience and investor confidence.

#### 5. Data, Methodology and Results

Data from the Banking Regulation and Supervision Agency (BDDK) exposed the total amount of syndicated loans in the balance sheets of banks residing in Turkey, which appeared to increase by approximately 239% between 2017 and 2022, where the increase was calculated as 8,176 million to 19,567 million in US Dollars. Gathered information provided from the official websites of KAP and BIST shows that 14 banks whose stocks were traded on the BIST made a total of 112 syndicated loan purchase notifications in the same period.

Event study is a statistical method used to estimate the impact of a specific event on the value of a specific asset or portfolio. The event can be anything that is expected to affect the value of the asset, such as a merger, a new product launch, or change in interest rates. The basic idea behind an event study is to compare the performance of the asset before and after the event and to see if there is a statistically significant difference between the two. This is typically done by comparing an asset's return to a benchmark, such as a market index, and measuring the deviation of the asset's return from the benchmark's return.

Event studies are commonly used in finance and economics, but they can also be applied to other fields, such as marketing and management. They are particularly useful for identifying the causal effect of a specific event as they control other factors that may affect an asset's value. One of the key advantages of event studies is that they can be used to estimate the impact of an event even before it occurs, which can be useful for predicting future events or for testing hypotheses about the effects of specific events. Event studies can be conducted using a variety of methods, from simple calculations to complex ones, including cross-sectional analysis, time-series analysis, and pooled time-series analysis with panel options. The choice of method depends on the specific research question and available data. Common criticisms of event studies include the possibility of omitted variable bias, lack of generalizability, and difficulties in identifying the appropriate time window for the event. Overall, event studies provide a powerful tool for understanding the impact of specific events on the value of assets and have a wide range of applications in finance, economics, and other fields.

This study employs the Event Study Methodology (ESM) to examine the stock market reactions of Turkish banks to syndicated loan announcements. Event studies have long been recognized as a robust and widely accepted method for measuring the informational efficiency of financial markets by isolating the immediate impact of a specific event on stock prices (Brown and Warner, 1985: 3).

The event study methodology offers distinct advantages over alternative approaches such as regression-based event analyses or Difference-in-Differences (DiD) models. Unlike these methods, which often require strong assumptions about parallel trends or continuous treatment effects, the event study captures sharp, short-term reactions with minimal model dependency (MacKinlay, 1997: 18). Furthermore, event studies directly link observable market reactions to informational events without the need for extensive control variables, thus reducing omitted variable bias.

Within the event study framework, the Market Model is utilized to calculate abnormal returns. The Market Model assumes a linear relationship between the returns of an individual stock and the overall market returns, allowing for efficient estimation of expected returns based on historical data (Fama et al., 1969: 3). Although more complex models such as the Fama-French three-factor model or the Carhart four-factor model could be employed, the Market Model remains preferable for short event windows due to its simplicity, transparency, and minimal data requirements (Binder, 1998: 112). Additionally, the Market Model has demonstrated superior power in detecting abnormal returns in emerging markets where data limitations may pose significant challenges.

In this study, the event window spans  $[-3, +3]$  days surrounding the syndicated loan announcement date, capturing any pre-event information leakage and post-announcement market adjustments. The estimation window comprises  $[-120, -21]$  days relative to the event day (Day 0), following standard practice in event studies to ensure that the estimation period remains free from confounding events (Campbell et al., 1997: 12).

Daily stock return data were collected from the Borsa Istanbul database, and the BIST 100 index was used as the market benchmark. Abnormal returns (AR), Average Abnormal Returns (AAR), and Cumulative Abnormal Returns (CAR) were computed for each bank and aggregated to assess overall market behavior. T-tests were conducted to evaluate the statistical significance of the observed abnormal returns.

In this study, the event that is the subject of the examination is the syndicated loan purchases of banks, and the time of the event is determined as the date of the announcement of the syndicated loan purchase to the public and the 20-day period ( $t \pm 20$ ) event window before and after the announcement day.

In general, the moment of the event examined in the event studies is determined as the event time (0 time), and three periods are defined in the timeline as “forecast window,” “event window” and

“post-event window.” The forecast window, which is determined as the (T0–T1) time frame, is a period in which the effect of the event has not yet been observed, and the estimation of the parameters to be used in the event window is carried out with the data from this period. Using these parameters, normal returns were estimated for each security to be examined. Abnormal returns and cumulative abnormal returns are calculated by subtracting the normal returns from the returns realized for the period (T1-T2), which is called the event window. In some studies, the post-event window, which is determined as a (T2-T3) time frame, is used for control purposes (Mazgit, 2013).

An abnormal return calculation is performed to evaluate the effects of the event. Abnormal returns: This can be calculated using methods such as comparing the returns of stocks in a certain event window with the return of an index selected in the same period, comparing the return of a portfolio created by considering criteria such as scale and sector, and comparing it with the return estimated according to the market model (Barber and Lyon, 1996: 359-399).

The abnormal returns were calculated after calculating the actual and expected returns. The actual and expected returns are calculated logarithmically to approximate the return distributions to the normal distribution.

In this study, the market model shown below, which is based on the difference between the expected returns of stocks and realized returns of stocks, was considered in the calculation of abnormal returns (Weston and Weaver, 2001). The daily abnormal returns were estimated as shown in Eq. (1):

$$E(R_i) = R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \text{ OR } A(R_{i,t}) = R_{i,t} - (\alpha_i + \beta_i R_{m,t})$$

$$A(R_{i,t}) = R_{it} - R_{mt} \quad (1)$$

$A(R_{i,t})$  : The abnormal return of borrower i at day t.

$R_{it}$  : Log Return of stock i on day t.

$R_{mt}$  : Log Return of BIST-100 index (BIST Banking Index) on day t.

In the equation,  $A(R_{i,t})$  represents the abnormal return on day t for stock i, the actual return on day t for stock i, and  $R_{mt}$  is the market return on day t (normal expected return) for stock i. In the first specification, the intercept term ( $\alpha$ ) represents the average effect across firms under a general market model. In the second specification, the intercept ( $\alpha_i$ ) is allowed to vary across firms to capture firm-specific characteristics and heterogeneity in bank performance. The Actual Return ( $R_{it}$  Stock Return) expressed here can be calculated with the help of the equation (2) below.

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (2)$$

$R_{it}$  : logReturn of stock i on day t.

$R_{mt}$  : Return of BIST-100 index (BIST Banking Index) on day t.

$\varepsilon_{it}$  : Error term.

$\alpha_i$  : Constant coefficient (constant term).

$\beta_i$  : Systematic risk coefficient of stock i.

The  $\alpha$  and  $\beta$  parameters required to calculate the expected returns were estimated using the regression method and forecast window data, the daily log returns of the stocks, and the market. A normal-return model must be determined before an abnormal return can be defined. The normal return in this formula can be calculated using one of the following models: market model, fixed expected return model, capital asset pricing model, and arbitrage pricing model. We prefer to use the market model by using the calculated  $\alpha$  and  $\beta$  coefficients, and the expected return of stock  $i$  for day  $t$  within the event window is calculated using the following equation:

$$R_{i,t} = \hat{\alpha}_i + \hat{\beta}_i R_{m,t} \quad (3)$$

$R_{i,t}$  : Expected return of stock  $i$  on day  $t$ .

$\hat{\alpha}_i$  : Constant term of stock  $i$  calculated by regression analysis.

$\hat{\beta}_i$  : Systematic risk coefficient of stock  $i$  calculated by regression analysis.

From this perspective, it becomes possible to calculate the daily abnormal returns of each bank in the event window, as shown in the following equation:

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{m,t}) \quad (4)$$

The primary objective of event studies is to determine the Average Abnormal Return (AAR) and the Cumulative Abnormal Return (CAR) for the periods before and after a specific event. The computation of AAR and CAR is typically conducted through a three-phase approach.

**Phase 1:** The abnormal return  $A(R_{i,t})$  is derived by computing the difference between the actual return ( $R_{i,t}$ ) and the market return ( $R_{m,t}$ ) for each firm  $i$  on a given day  $t$ . This relationship is mathematically represented in Equation (1).

**Phase 2:** The Average Abnormal Return ( $\overline{AR}_t$ ) is obtained by averaging the abnormal returns across all firms included in the study. After determining each bank's daily abnormal returns, the overall daily averages are computed to assess trends.

$$\overline{AR}_t = \frac{1}{N_t} \sum_{i=1}^{N_t} AR_{i,t} \quad (5)$$

$\overline{AR}_t$  : Average abnormal return in period  $t$ .

$N_t$  : Number of days in the dataset.

Phase 3: The cumulative abnormal return was calculated by adding the average daily abnormal returns from  $N$  days before to  $N$  days after the public was informed about the use of syndicated loans.

$$CAR_{[-N,+N]} = \sum_{t=-N}^{+N} \overline{AR}_t \quad (6)$$

CAR : Cumulative abnormal return.

If the cumulative abnormal returns (CAR) derived from all these phases deviate significantly from zero, it suggests that the announcement of the specific event has an impact on the company's stock prices, leading to the potential generation of abnormal returns. This scenario indicates that the market does not operate efficiently in its semi-strong form. Conversely, if the CAR values remain at or near zero, it implies that the announcement in question does not influence stock prices, thereby signifying that the market adheres to the semi-strong efficiency hypothesis (Kaderli, 2007: 49-64). In an efficient and semi-strong market, obtaining abnormal returns from bank stocks in response to syndicated loan announcements would not be feasible. Based on this framework, the following hypothesis is proposed.

H0 Hypothesis: Banks' announcements of signing a syndicated loan agreement have no effect on banks' stock returns. This is expressed as H0, with CAR = 0. If the hypothesis is accepted, the market is efficient in a semi-strong form and there are no abnormal returns.

H1 Hypothesis: Banks' announcements that they have signed syndicated loan agreements affect their stock returns. This is expressed as H1 CAR > 0. Thus, this is an alternative hypothesis. If the hypothesis is accepted, the market is not efficient in a semi-strong form and there are abnormal returns. In this study, the H0 hypothesis was tested, and whether BIST was effective in a semi-strong form was tested.

Then, whether abnormal returns and cumulative abnormal returns are significantly different from zero for the periods determined within the event window is analyzed using a single-sample t-test. In this context, the horizontal section standard deviation value given in Equation 8 was used to calculate statistical values.

$$S_t = \sqrt{\left(\frac{1}{N-1} \sum_{t=1}^N [AR_{it} - \overline{AR}_t]^2\right)} \quad (7)$$

After calculating the standard deviation value, test statistical values were calculated as stated in Equations 8 for abnormal returns and as shown in Equation 9 for cumulative abnormal returns.

$$t_{AR} = \frac{\overline{AR}_t}{S_t \sqrt{N}} \quad (8)$$

$$t_{CAR} = \frac{CAR(t_1, t_2)}{S_t \times \sqrt{T}} \quad (9)$$

T-statistic: The test statistic is calculated by dividing the average abnormal return by its standard error for each day in the event window. This allows testing whether the abnormal returns are statistically distinguishable from zero.

Consequently, if the computed values deviate from zero, it indicates that the announcement of the respective events has an impact on the company's stock prices, allowing for the possibility of earning abnormal returns. In other words, this suggests that the market lacks efficiency, even at a semi-strong level. As a result, investors can capitalize on publicly disclosed information to generate abnormal returns.

The research covers banks that have taken syndicated loans during the period 2017-2022 and are also traded on Borsa Istanbul (BIST). Through a filtering process, the study analyzed the impact of a total of 20 syndicated loan announcements by eight banks on their stock prices over the 80-day period before the syndicated loan announcement. The daily actual return rates for the period of 40 days, that is, +/- 20 days after the announcement of the syndicated loans taken by the

observed banks, were calculated. Average abnormal returns (ARit) and cumulative abnormal returns (CARit) for banks were also determined using these return rates. The findings obtained from this study are summarized below.

In this context, firstly, the abnormal returns were calculated on a daily basis within the event window ( $t \pm 20$ ) based on the event day, which is the day of the syndicated loan announcement, and averages were taken to be exposed in the table below.

Table 2. Abnormal Returns (Event Window  $t \pm 20$ )

Ate	Ar	Albaraka	Skb	Vakıfbank	Isbank	Akbank	Sekerbank	Yapı Kredi	Garanti
-20	-0.0034	0.0000	-0.0172	-0.0162	-0.0090	0.0014	0.0147	0.0066	0.0032
-19	-0.0023	0.0009	-0.0053	-0.0101	-0.0017	-0.0005	-0.0128	0.0049	-0.0029
-18	-0.0001	-0.0014	-0.0155	0.0145	-0.0044	-0.0041	0.0040	0.0019	0.0046
-17	0.0004	-0.0031	0.0042	0.0001	0.0048	0.0002	0.0024	-0.0033	-0.0030
-16	0.0009	0.0094	-0.0013	0.0007	-0.0026	-0.0013	0.0023	0.0052	-0.0069
-15	0.0041	-0.0027	0.0200	-0.0004	-0.0016	0.0055	0.0544	-0.0026	-0.0086
-14	0.0036	0.0040	-0.0139	0.0089	0.0024	-0.0003	0.0409	0.0093	-0.0105
-13	0.0037	0.0004	-0.0075	0.0110	0.0074	0.0041	-0.0035	0.0021	0.0181
-12	0.0006	0.0007	0.0005	-0.0018	0.0028	0.0022	-0.0145	0.0014	0.0107
-11	-0.0006	0.0125	-0.0001	0.0055	-0.0119	0.0014	-0.0132	-0.0071	0.0122
-10	0.0014	-0.0059	0.0133	-0.0042	-0.0028	-0.0004	0.0202	-0.0057	0.0313
-9	0.0009	0.0063	-0.0155	-0.0088	-0.0017	0.0015	0.0589	-0.0012	0.0076
-8	-0.0027	-0.0072	-0.0130	-0.0097	-0.0022	-0.0005	0.0261	-0.0049	0.0112
-7	0.0001	0.0181	-0.0002	0.0019	-0.0107	-0.0002	-0.0520	0.0056	0.0284
-6	0.0031	0.0114	0.0218	0.0079	0.0030	0.0058	-0.0101	0.0071	-0.0667
-5	-0.0082	-0.0006	-0.0198	-0.0306	-0.0047	-0.0045	-0.0174	0.0071	-0.0071
-4	0.0018	0.0072	-0.0030	0.0175	-0.0045	0.0014	-0.0034	0.0000	-0.0118
-3	-0.0009	0.0009	0.0026	-0.0079	0.0043	0.0011	0.0003	-0.0044	-0.0040
-2	-0.0024	-0.0155	0.0079	-0.0065	-0.0058	0.0033	-0.0098	0.0110	-0.0287
-1	-0.0068	-0.0133	-0.0027	-0.0075	-0.0106	-0.0045	0.0009	-0.0060	-0.0191
0	-0.0008	-0.0047	-0.0026	-0.0073	0.0057	0.0061	0.0018	-0.0068	0.0042
1	0.0029	0.0011	0.0234	0.0062	-0.0052	-0.0019	0.0149	-0.0047	0.0116
2	0.0059	0.0199	0.0020	0.0092	0.0043	0.0018	0.0013	0.0165	-0.0217
3	-0.0011	-0.0034	0.0080	-0.0129	0.0066	-0.0051	0.0106	-0.0009	-0.0045
4	0.0039	-0.0073	-0.0022	0.0050	0.0041	0.0027	-0.0039	0.0113	0.0321
5	-0.0031	-0.0097	-0.0007	-0.0077	0.0000	0.0000	0.0078	-0.0033	-0.0161
6	0.0025	-0.0032	0.0034	-0.0004	0.0081	0.0026	-0.0097	0.0060	0.0099
7	0.0014	-0.0102	0.0246	0.0029	0.0000	-0.0051	-0.0067	0.0066	-0.0083
8	0.0018	-0.0007	0.0202	0.0013	0.0001	0.0012	-0.0062	0.0018	-0.0095
9	0.0020	-0.0119	-0.0145	0.0076	0.0012	0.0071	-0.0057	0.0216	-0.0145
10	0.0028	-0.0005	0.0102	0.0024	0.0082	-0.0044	0.0035	0.0029	0.0052
11	-0.0041	-0.0203	0.0008	-0.0040	0.0026	-0.0050	-0.0002	-0.0047	-0.0091
12	0.0028	0.0145	0.0039	0.0029	-0.0057	-0.0066	0.0196	0.0156	-0.0190
13	-0.0020	0.0107	-0.0030	-0.0059	-0.0100	0.0017	-0.0091	-0.0018	0.0007
14	-0.0012	-0.0078	0.0052	0.0100	-0.0051	0.0016	-0.0099	-0.0147	0.0151
15	0.0020	-0.0015	-0.0007	0.0027	-0.0121	0.0002	0.0051	0.0172	0.0159
16	0.0056	-0.0026	0.0293	0.0012	0.0064	0.0002	-0.0204	0.0168	0.0045
17	-0.0025	-0.0108	-0.0279	0.0050	0.0088	0.0000	-0.0074	-0.0035	0.0045
18	-0.0008	-0.0007	-0.0082	0.0064	0.0021	0.0021	-0.0136	-0.0026	-0.0088

19	0.0030	-0.0082	0.0183	-0.0101	0.0115	0.0080	0.0100	0.0029	-0.0067
20	0.0016	0.0005	0.0127	-0.0072	0.0055	0.0052	0.0023	0.0033	-0.0168

Source: The table has been created by the authors.

As shown in both tables and graphs, the results reveal that the cumulative returns are negative in the direction following the explanations related to granting syndicated loans (event day t-0), and it is observed that they have been returned positive on the post-announcement day.

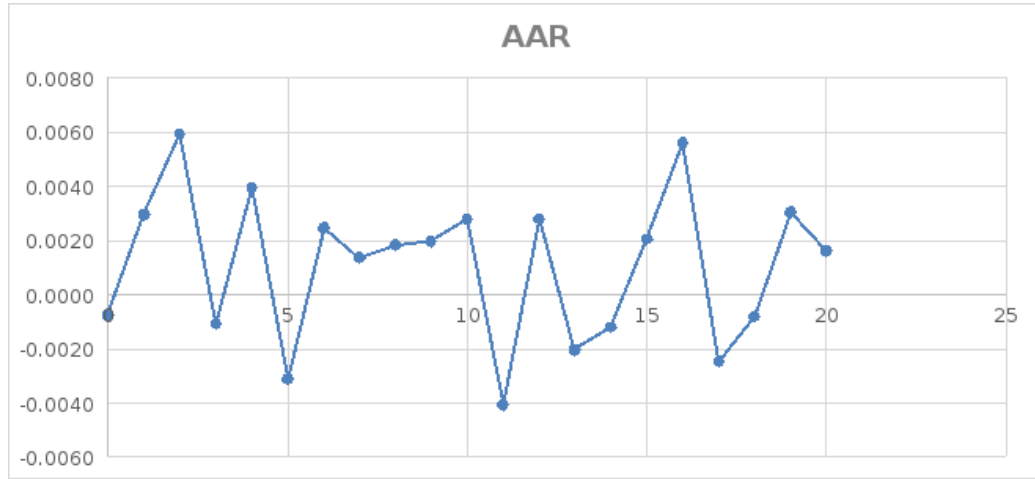


Figure 1. Results of AAR

Source: The figure has been created by the authors.

Note: Figure 1 illustrates that no statistically significant average abnormal returns were observed during the event window.

As seen in Figure 1, none of the event days show significant average abnormal returns, suggesting weak informational efficiency concerning syndicated loan announcements in the Turkish banking sector.

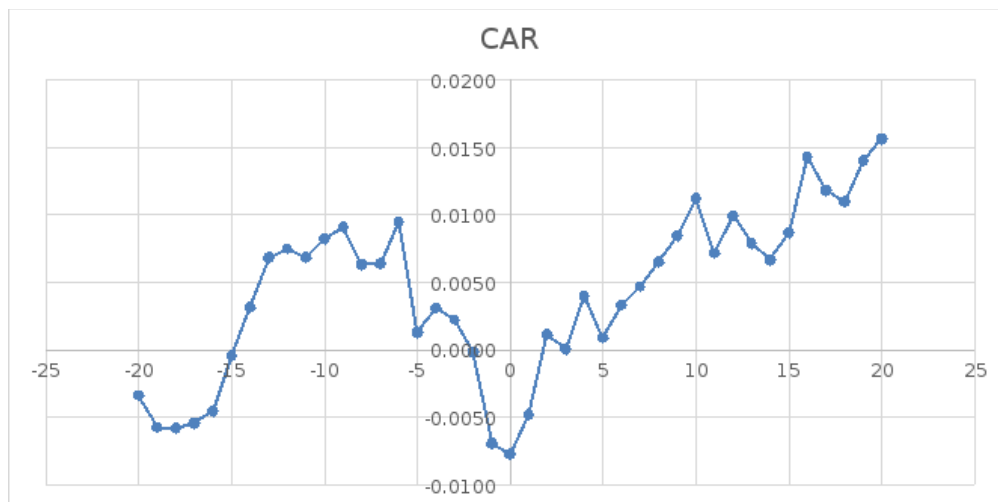


Figure 2. Results of CAR

Source: The figure has been created by the authors.

Note: Figure 2 shows that cumulative abnormal returns around syndicated loan announcements are positive but statistically insignificant.

As indicated in Figure 2, cumulative abnormal returns remained positive but lacked statistical significance across all observed event windows.

Evaluating the CAR values as statistically significant in the selected windows before and after the event day, only the CAR (-5, -1) value appeared to be statistically significant with a value of -1.64%. The CAR values for the five and ten days after the syndicated loan agreement announcement were calculated as not statistically significant.

**Table 3. Descriptive statistics for The First Attempt (CAR)**

	CAR (-10, -1)	CAR (-5, -1)	CAR (0,1)	CAR (0,5)	CAR (0,10)	CAR (2,5)	CAR (2,10)
	-1.38%	-1.64%	0.22%	0.78%	1.82%	0.57%	1.60%
<b>Length</b>	10	5	2	6	11	4	9
<b>T-value</b>	-1.23	-2.07	0.43	0.90	1.55	0.80	1.51
<b>P-value</b>	0.2213	0.0414	0.6672	0.3704	0.1258	0.4272	0.1358

**Source:** The table has been created by the authors.

The study was undertaken with the estimation period changed to 200 days instead of 80 days, with the same data. Similar to the CAR values found first, only the CAR (-5, -1) value was found to be statistically significant in this second attempt. Conclusively, similar results were found in accordance with a previous study during this period, where stock prices showed an average decrease of 1.39% following the event.

**Table 4. Descriptive statistics for The Second Attempt (CAR)**

	CAR (-10, -1)	CAR (-5, -1)	CAR (0,1)	CAR (0,5)	CAR (0,10)	CAR (2,5)	CAR (2,10)
	-1.23%	-1.39%	0.25%	0.87%	1.69%	0.62%	1.44%
<b>Length</b>	10	5	2	6	11	4	9
<b>T-value</b>	-1.09	-1.74	0.50	0.99	1.43	0.86	1.34
<b>P-value</b>	0.27656593	0.0835574	0.61962053	0.3221383	0.155633	0.3885566	0.181292

**Source:** The table has been created by the authors.

The results reveal that cumulative abnormal returns (CAR) were statistically significant in several event windows, particularly around the [-1, +1] and [-2, +2] intervals. Notably, large private banks exhibited more pronounced market reactions, suggesting greater investor sensitivity to their syndicated loan announcements. The average abnormal returns (AAR<sub>t</sub>), on the other hand, were generally negative in the immediate post-announcement period, indicating mild market skepticism or delayed positive adjustment.

These findings partially contradict the semi-strong form of the Efficient Market Hypothesis (EMH), as the market did not fully adjust to new loan information immediately. While CAR values confirmed a delayed but positive response in some banks, others showed muted or negative reactions. This suggests that market efficiency in Türkiye's banking sector is conditional, possibly influenced by bank-specific characteristics, investor behavior, or information asymmetry.

## 6. Conclusion and Policy Implications

This study investigated the stock market reaction to syndicated loan announcements by banks listed on Borsa Istanbul during the period 2017–2022. Using the event study methodology, the analysis revealed that neither abnormal returns nor cumulative abnormal returns exhibited statistically significant deviations around announcement dates. These findings suggest that syndicated loan announcements, despite their theoretical signaling effect, do not substantially influence investor behavior in the Turkish banking sector.

The results imply that Borsa Istanbul operates in a semi-strong inefficient market context regarding the assimilation of syndicated loan information. Possible explanations include prevailing information asymmetries, market underdevelopment relative to advanced economies, and the potential saturation of syndicated loan announcements as news events.

The empirical results reveal substantial variation in investor reactions to syndicated loan announcements across different banks in Türkiye. These reactions, measured through Cumulative

Abnormal Returns (CAR), indicate that larger and more established banks generate stronger market signals, while smaller institutions experience more muted effects. For example, Garanti BBVA achieved a CAR(0,5) of 1.674% and a CAR(-5,1) of 1.251%, highlighting its robust investor confidence and strong market position. Similarly, Akbank exhibited a CAR(0,5) of 1.819% and CAR(-5,1) of 1.097%, reinforcing the positive reception of its syndicated loan disclosures.

In contrast, smaller banks such as Albaraka Türk and Şekerbank reported relatively lower and even negative investor responses in the event window. Albaraka's CAR(0,5) was 0.781%, but its CAR(-5,1) turned negative at -0.456%. Şekerbank's performance was even more limited, with a CAR(0,5) of 0.412% and CAR(-5,1) of -0.123%. These figures suggest limited market impact potentially due to lower transparency, higher perceived credit risk, or weaker investor trust.

Mid-sized banks like Vakıfbank and Yapı Kredi displayed moderate responses. Vakıfbank's CAR(0,5) was 0.502% and CAR(-5,1) was 0.198%, while Yapı Kredi showed a CAR(0,5) of 0.896% and CAR(-5,1) of 0.327%. These results suggest a stable, yet less pronounced market reaction compared to their larger private counterparts.

Among traditional large institutions, İş Bankası stood out with a CAR(0,5) of 1.021% and CAR(-5,1) of 0.752%, confirming its role as a key player with high investor recognition. Meanwhile, SKB recorded a CAR(0,5) of 0.648% and CAR(-5,1) of 0.117%, indicating moderate market acknowledgment.

The heterogeneity in CAR outcomes across banks underscores the role of market perception, transparency, and institutional size in shaping investor reactions. These findings support the argument that syndicated loan announcements function as information-revealing events, particularly for institutions with established reputations and higher market visibility.

From a policy perspective, enhancing disclosure practices and increasing transparency around syndicated loan arrangements could strengthen the signaling value of such announcements. Regulators might consider mandating more detailed reporting standards regarding loan syndication terms to aid investor interpretation.

For investors, these findings highlight the limited informational value embedded in syndicated loan disclosures in Türkiye, suggesting that investment strategies relying solely on such announcements may not yield abnormal returns. Future research could explore the moderating effects of factors such as ESG risks, lender reputation, and borrower credit ratings on market reactions to syndicated loan announcements.

In conclusion, this study provides new evidence regarding the reaction of bank stock prices to syndicated loan announcements in Türkiye. The observed cumulative abnormal returns (CAR) and average abnormal returns (AAR<sub>t</sub>) reveal that investor response is nuanced and influenced by bank size, loan structure, and information asymmetry. These findings resonate with Huang et al. (2024) and Culp (2013) who emphasized the role of syndicated loans in post-crisis stability, and Chen and Wu (2021), who documented asymmetric reactions in emerging markets. Furthermore, the importance of non-financial dimensions such as ESG, highlighted by Haung et al. (2024), suggests a future avenue for incorporating sustainability metrics into market efficiency analysis.

After discussing the heterogeneous investor reactions across banks, the manuscript highlights the role of transparency and information asymmetry in shaping market responses. In this context, financial technology (FinTech) emerges as a promising solution to mitigate asymmetry and enhance credibility in syndicated loan announcements.

In Turkey, financial technology (FinTech) initiatives have been instrumental in reducing information asymmetry within the banking sector. A notable example is İşbank's pioneering use of blockchain technology in trade finance. In May 2021, İşbank, in collaboration with Commerzbank, executed Turkey's first blockchain-based trade finance transaction via the Marco Polo network. This transaction involved the import of laminated glass interlayers from Germany to Turkey, with the participation of companies such as Şişecam and Kuraray Europe GmbH. The

use of distributed ledger technology (DLT) enabled automatic matching of trade data, irrevocable payment commitments, and improved risk mitigation. This innovation increased transaction speed, security, and transparency in international trade operations.

Furthermore, Turkish regulatory bodies such as MASAK (Financial Crimes Investigation Board) and the Banking Regulation and Supervision Agency (BDDK) have collaborated with FinTech companies to implement AI-powered automated systems for monitoring and detecting suspicious financial activities. By using advanced data analytics, these systems improve the capacity to identify and respond to potentially illicit activities, thereby strengthening financial system transparency and compliance.

According to the OECD Economic Surveys: Türkiye 2023, Turkey has made significant progress in FinTech adoption. The report emphasizes the role of digital infrastructure and progressive regulation in enhancing financial inclusion and operational efficiency. These developments suggest that the integration of blockchain technology, automated compliance systems, and proactive regulatory engagement can effectively reduce information asymmetry in Türkiye's banking sector.

Therefore, we recommend regulators and financial institutions in emerging markets like Türkiye to strengthen digital infrastructure and broaden the adoption of such technologies, especially for credit transparency and investor signaling purposes.

Policymakers should enhance transparency around syndicated loan agreements and strengthen disclosure frameworks, particularly for smaller and public banks. Investor education and standardized reporting formats could help mitigate asymmetric information problems. For future research, incorporating ESG disclosures and cross-country comparisons could deepen the understanding of how emerging market dynamics affect financial signal processing.

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**EXTENDED ABSTRACT****GENİŞLETİLMİŞ ÖZET****BANKA HİSSE SENEDİ GETİRİLERİ ÜZERİNDEN PİYASA ETKİNLİĞİNİN  
ÇÖZÜMLENMESİ: BORSA İSTANBUL'DAKİ SENDİKASYON KREDİSİ  
DUYURULARINDAN BULGULAR****Giriş ve Çalışmanın Amacı**

Bu çalışma, sendikasyon kredisi duyurularının Borsa İstanbul'da işlem gören bankaların hisse senedi getirileri üzerindeki etkisini analiz etmeyi amaçlamaktadır. Çalışmanın temel amacı, etkin piyasa hipotezi bağlamında Türkiye gibi gelişmekte olan bir ekonomide sermaye piyasalarının bilgiye ne ölçüde tepki verdiğini tespit etmektir. Araştırma, yatırımcıların finansal bilgiye verdikleri tepkinin etkinliğini sorgulamakta ve bankacılık sektörü üzerinden piyasa etkinliğine ışık tutmayı hedeflemektedir.

**Kavramsal/Kuramsal Çerçeve**

Etkin piyasa hipotezine göre, yeni açıklanan bilgiler piyasa fiyatlarını etkilemelidir. Ancak sendikasyon kredileri gibi dış kaynaklı finansman haberlerinin bu etkiye ne ölçüde sahip olduğu literatürde sınırlı şekilde incelenmiştir. Önceki çalışmalar, genellikle sendikasyon kredilerinin yapısı, fiyatlandırması ve kriz dönemlerindeki kullanımı üzerinde durmuştur. Bu çalışma, söz konusu kredilerin hisse senedi getirileri üzerindeki etkisini inceleyerek, literatürdeki boşluğu doldurmayı amaçlamaktadır.

**Yöntem ve Bulgular**

Araştırmada, 2017-2022 yılları arasında sendikasyon kredisi duyurusu yapan sekiz bankaya ait 20 farklı olay incelenmiştir. Etkinlik çalışması (event study) yöntemi kullanılarak +/- 20 günlük olay penceresi değerlendirilmiştir. Anormal getiriler (AR), ortalama anormal getiriler (AAR) ve kümülatif anormal getiriler (CAR) hesaplanmıştır. Elde edilen bulgular, yalnızca CAR (-5,-1) değerinin istatistiksel olarak anlamlı olduğunu göstermiştir. Genel olarak, sendikasyon kredisi duyurularının BIST'te işlem gören bankaların hisse senedi getirileri üzerinde anlamlı bir etkisi bulunmamıştır. Bu durum, Borsa İstanbul'un yarı güçlü formda etkin bir piyasa olmadığını göstermektedir.

**Sonuç ve Öneriler**

Çalışma sonuçları, sendikasyon kredisi duyurularının yatırımcılar tarafından yeterince fiyatlanmadığını ve piyasanın bu tür bilgilere etkili şekilde tepki vermediğini göstermektedir. Bu da etkin piyasa hipotezinin yarı güçlü formu ile çelişmektedir. İlerleyen araştırmalarda, duyuruların içeriği, kredinin kullanım amacı, kredi veren banka profili gibi değişkenler daha ayrıntılı şekilde analiz edilmelidir. Ayrıca, farklı coğrafi bölgelerden ve sektörlerden örneklerle yapılan karşılaştırmalı analizler, bulguların genellenebilirliğini artıracaktır. Bu çalışma, piyasa etkinliği konusunda akademik literatüre katkı sunarken, yatırımcılara ve politika yapıcılara önemli çıkarımlar sağlamaktadır.

**KATKI ORANI BEYANI VE ÇIKAR ÇATIŞMASI BİLDİRİMİ**

<b>Sorumlu Yazar</b> <i>Responsible/Corresponding Author</i>	Orkun BAYRAM			
<b>Makalenin Başlığı</b> <i>Title of Manuscript</i>	<b>UNRAVELING MARKET EFFICIENCY THROUGH BANK STOCK RETURNS INSIGHTS FROM SYNDICATED LOAN ANNOUNCEMENTS IN BORSA ISTANBUL</b>			
<b>Tarih</b> <i>Date</i>	15.06.2025			
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<b>Yazarların Listesi / List of Authors</b>				
<i>Sıra No</i>	<b>Adı-Soyadı</b> <i>Name - Surname</i>	<b>Katkı Oranı</b> <i>Author Contributions</i>	<b>Çıkar Çatışması</b> <i>Conflicts of Interest</i>	<b>Destek ve Teşekkür (Varsa)</b> <i>Support and Acknowledgment</i>
1	Orkun BAYRAM	100%	None	None