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Who Leads, Who Follows? Peer Effect on Bank Leverage Decisions in Türkiye[1]

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Abstract

This study examines the role of peer effect on bank leverage decisions in the Turkish banking sector. Data from 21 deposit banks operating between 2007 and 2022 were analysed using the Panel-Corrected Standard Errors (PCSE) method. In the model, the dependent variable is the bank leverage ratio, the independent variable is peer bank leverage, and the control variables are bank size, liquidity ratio, and loss provisions/total assets ratio. The findings show that peer influence is positive and significant, indicating that their peers' financial behaviour influences banks' leverage decisions. The study aims to demonstrate that bank decisions are shaped not only by internal factors but also by sectoral interactions.

Keywords : Peer Effect, Bank Behaviour, Leverage Decisions, Banking Sector.

JEL Classification Codes : G21, G32, D85.

Öz

Bu çalışma, Türk bankacılık sektöründe akran etkisinin banka kaldıraç kararları üzerindeki rolünü incelemektedir. 2007-2022 döneminde faaliyet gösteren 21 mevduat bankasına ait veriler Panel-Corrected Standard Errors (PCSEs) yöntemiyle analiz edilmiştir. Modelde bağımlı değişken banka kaldıraç oranı, bağımsız değişken akran banka kaldıracı; kontrol değişkenler ise banka büyüklüğü, likidite oranı ve zarar karşılıkları/toplam varlıklar oranıdır. Bulgular, akran etkisinin pozitif ve anlamlı olduğunu, bankaların kaldıraç kararlarını akranlarının finansal davranışlarından etkilenerek aldığını göstermektedir. Çalışmanın motivasyonu, banka kararlarının yalnızca içsel faktörlerle değil, sektörel etkileşimlerle de şekillendiğini ortaya koymaktır.

Anahtar Sözcükler : Akran Etkisi, Banka Davranışı, Kaldıraç Kararları, Bankacılık Sektörü.

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[2] *Bu makale, 16-18 Mayıs 2024 tarihlerinde Bozüyük'te düzenlenen 4. Uluslararası Bankacılık Kongresi'nde sözlü olarak sunulan "Bankacılıkta Kaldıraç Kararlarını Şekillendiren Akran Dinamikleri - Türkiye Örneği" başlıklı özetin gözden geçirilmiş ve genişletilmiş halidir.*

1. Introduction

The functionality of the financial system for the sustainability of economic development has been widely discussed in the literature (Arestis & Demetriades, 1997; Ahmed, 2010; Ozili & Iorember, 2024). In this context, the finding that the financial system supports economic growth by efficiently allocating resources is prominent (King & Levine, 1993; Levine, 1996). It is stated that an efficient financial system benefits both individual and institutional investors and contributes to increased national wealth (Scholtens & Van Wensveen, 2003).

Banks, one of the main institutions of the financial system, play a critical role as intermediaries, collecting resources from segments with excess savings and transferring them to segments in need of funds. This intermediate function places banks at the centre of the system in terms of ensuring the continuity of the economic cycle. Their high leverage largely enables banks to fulfil these functions. While converting the deposits they collect into loans, banks tend to borrow much more than their shareholders' equity. While this situation supports the efficient allocation of financial resources, it also brings along systemic risks. Leverage levels have become a key factor affecting not only individual bank performance but also the stability of the entire financial system (Firestone et al., 2017). The 2008 Global Financial Crisis is considered a concrete example of this risk. During the crisis, it was observed that banks with seemingly adequate capital adequacy ratios built high-risk balance sheets through excessive borrowing, thereby deepening the crisis (D'Hulster, 2009; Acosta-Smith et al., 2020). The tendency of banks to borrow to maintain their leverage levels during periods of rising asset prices is considered a dynamic that increases systemic fragility (Baglioni et al., 2013). Since risk-weighted capital adequacy ratios are susceptible to manipulation, the leverage ratio serves as a safeguard to compensate for this shortcoming (Blum, 2008; Kiema & Jokivuolle, 2014). Within the scope of Basel III regulations, a minimum leverage ratio of 3% was implemented; this ratio was considered a measure to increase the system's resilience in cases where risk-weighted regulations are insufficient (Türküner, 2016). The leverage ratio can be used as a prudential tool at both the micro level (e.g., disciplining banks' lending behaviour) and the macro level (e.g., limiting credit growth and supporting economic stability). Consequently, it plays a role in ensuring financial stability and preventing systemic risks that could spread throughout the economy. Ultimately, it is emphasised that credit cycles can be effective in reducing behaviours or mechanisms that amplify the current economic cycle, or in other words, in balancing variables or policies that move in the same direction as economic cycles (D'Hulster, 2009).

Avgouleas (2015) argues that the leverage ratio strengthens financial stability by limiting not only individual bank risks but also systemic debt accumulation. Similarly, Barth and Miller (2018) argue that increases in the leverage ratio can reduce the frequency and severity of crises, thereby mitigating the negative effects on economic contraction. In the same study, it is argued that increasing the leverage ratio from 4% to 15% may result in significant reductions in crisis costs. Although the leverage ratio is an effective regulatory tool, its failure to account for differences in risk nature is considered an important limitation.

Fender and Lewrick (2015) emphasise the leverage ratio's role in limiting the accumulation of cyclical and structural risk and argue that it provides net economic benefits when kept between 4% and 5%. Grill, Lang and Smith (2016), on the other hand, argue that the leverage ratio may encourage banks' risk-taking behaviour in some cases, but high capital buffers can offset this negative effect. In this context, the question of what the optimal leverage ratio should be remains a subject of debate in the literature. Begenau and Landvoigt (2022) and Egan et al. (2017) argue that certain leverage levels can have positive effects on economic welfare, while Barth and Miller (2018) state that increasing the leverage ratio may reduce crisis risk but could also negatively affect real investment and growth by increasing capital costs.

This study aims to determine whether a peer effect exists in the leverage decisions of deposit banks in Türkiye. In this context, 21 Turkish deposit banks were examined for the period 2007-2022. Using panel data analysis, the dependent variable is the bank leverage ratio, while the independent variables are peer bank leverage, bank size, liquidity ratio, and risk (loss provisions/total assets). Although the bank leverage ratio has been a heavily debated topic in the literature, the peer effect dimension has not been studied, particularly in the Turkish context. This study is expected to fill this gap in the literature and to provide concrete data for policy recommendations to regulators and decision-makers.

2. Conceptual Framework

In recent years, it has been widely accepted that decision-making processes in financial markets are influenced by both behavioural factors and rational approaches (Doğan, 2016; Umapathy, 2024). In this context, peer effect is defined as individuals or institutions shaping their own behaviour by observing the decisions of other actors operating under similar conditions (Lahno & Serra-Garcia, 2015). Not only in daily decisions but also in financial decisions, a person's choices are influenced by those around them. In this context, individuals influenced by others in their financial behaviour make decisions based on others' choices. In addition, this influence is considered an important factor for companies, as studies show that peer influence is present in their financial management. For example, Adhikari and Agrawal (2018) show that companies' distribution policies, such as dividends and share buybacks, are significantly influenced by peers' policies in the same sector. Especially in sectors such as banking, where information asymmetry is high, decision-making processes are complex and external risks are intense, the peer effect becomes more evident.

The theoretical foundations of peer effects are primarily associated with social learning theory (Bandura, 1977). According to this theory, individuals learn from their environment through observation, and the actions of other actors serve as a reference point, especially in conditions of uncertainty. Conlisk (1980) interpreted this behaviour as a strategy to avoid the costs of acquiring information and making decisions, and stated that individuals or firms prefer to imitate successful peers rather than engage in trial-and-error. Manski (1993) argues that firms tend to adopt the strategies of peer firms that they observe

in their environment, especially during periods of high uncertainty. Additionally, Lieberman and Asaba (2006) examined why firms imitate each other. They reviewed the existing literature and proposed two different theoretical frameworks. The first is the information-based theory, and the other is the rivalry-based theory. The information-based theory suggests that firms follow other firms that are believed to possess superior knowledge. According to this theory, managers, especially during periods of high uncertainty, cannot clearly establish cause-and-effect relationships when making decisions and therefore take their peers' decisions as information signals. Within this theory, there are two mechanisms within economic approaches: information cascades/social learning and reputation-based imitation. The organisational sociology and ecology approaches in information-based theory state that, according to mimetic isomorphism (DiMaggio & Powell, 1983), organisations in uncertain environments are influenced by and emulate their more successful peers, thereby reducing their knowledge costs. According to legitimacy theory, companies that reach a critical mass in new industries help the sector gain legitimacy. This situation facilitates access to financing and encourages new entrants by increasing the workforce's attractiveness. Lieberman and Asaba (2006) propose the second main theory in the peer literature for firms: the Rivalry-Based Theory, which argues that firms imitate their competitors to maintain competitive equality or limit competition. These theories can be divided into two main groups: strategies aimed at limiting competition and strategies aimed at maximising risk. Following the leader is a prerequisite, and similar investments are made with peers to avoid falling behind. Imitating peers can involve negative aspects such as aggressive competition and excessive investment risks. For example, Posen and Martignoni (2018) similarly state that following peers' actions can lead to poor performance and the risk of worse performance. In this context, it is noted that while peer influence has positive aspects, it also poses negative aspects for companies.

The mechanism of peer effects in financial decisions is generally explained by three main channels: (i) interpreting the behaviour of other actors as a signal in markets with high information asymmetry (Lieber & Skimmyhorn, 2018), (ii) avoiding decision-making costs and saving time (Conlisk, 1980), and (iii) trying to conform to social norms or behavioural similarity (Bursztyn et al., 2014). These mechanisms lead bank managers to consider the preferences of similarly situated banks when making strategic and risky financial decisions, such as leverage.

For financial institutions, the peer effect manifests itself in many areas, such as loan portfolios (Wang et al., 2021), capital structures (Leary & Roberts, 2014), risk-taking behaviour (Wang et al., 2023), corporate cash policies (Chen et al., 2019), and corporate social responsibility. Especially in times of crisis or in highly competitive sectors, this effect becomes stronger (Xu & Wu, 2022; Warninda & Maryani, 2022). In this context, firms' excessive imitation of peers in the aftermath of financial crises has become a phenomenon that warrants careful examination, as it may increase systemic risk and spread poor decisions.

Although the impact of peer effect on leverage decisions is a relatively new area in the literature, it has received increasing attention. Lee et al. (2017) find that financial institutions are significantly influenced by the leverage levels of other firms in the industry when determining their leverage structures. Similarly, He and Wang (2020) find that leverage levels of Chinese firms are positively correlated with those of their industry peers. However, such studies are generally concentrated in non-financial sectors and evidence on the banking sector is limited.

This study examines the determinants of peer effects on bank-specific financial decision-making by analysing the extent to which bank managers are influenced by other banks' behaviour when setting leverage ratios. In addition to being the first study to empirically test social learning theory in the context of bank leverage decisions in the Turkish banking sector, the study has the potential to offer new regulatory perspectives to the Turkish financial system and policymakers, as well as to policymakers in similar countries that consider the behavioural dynamics between banks.

In the remainder of the study, theoretical and empirical literature on the subject will be reviewed, followed by a description of the data set and methodology, and the empirical findings will be presented.

3. Literature Review

The basis of the peer effect is individuals' observation and imitation of other actors in decision-making through social learning. Conlisk (1980) argued that individuals avoid the costs of acquiring knowledge by imitating successful actors, thereby reducing decision-making costs. Therefore, with this approach, he pioneered the adaptation of social learning to economic decisions. Kaustia and Knüpfer (2012) found that investors continue to enter the stock market in line with their peers' preferences, even when stock returns are negative, demonstrating that peer influence can also fuel irrational behaviour. In this regard, it presents evidence that peers' presence serves as a mechanism that reveals investors' psychological motivations beyond financial decisions, showing that investors do not behave rationally but instead reference their peers' preferences. Bursztyn et al. (2014) found that the concepts of social learning and social benefit can influence investment decisions, revealing that social learning has a decisive impact not only on individuals but also on market dynamics. Lahno & Serra-Garcia (2015) show that individuals take their peers' decisions into account based on their preferences and profit concerns. This can be seen as a step towards linking peer influence on modern behavioural economics and decision theory literature. It reveals that individuals do not merely imitate their peers' behaviour in their decision-making processes but also take these interactions into account while balancing their own benefit expectations and preferences. In line with this perspective, various studies have documented that the peer effect is also effective at the firm level. Peer effects are influential factors in many firms' strategic decisions, including cash holdings, capital structure, investment, dividend distribution, and stock splits. From the perspective of peer effects and financial leverage, Leary and Roberts (2014) argue that small, new, and unsuccessful firms imitate the capital

structures of larger and more successful firms. He and Wang (2020), in their study of Chinese firms, find that firms' leverage levels are positively associated with those of their peers. Francis et al. (2016) show that firms in both developed and developing countries take into account the leverage decisions of their sectoral peers. Kaustia and Rantala (2015) find that firms' stock split decisions are influenced by peers', while Ren et al. (2022) find that successful IPOs can shape price and credit conditions in the industry, especially among firms operating in an intensely competitive environment. Jinkrawee et al. (2023) find that firms may exhibit cash-holding behaviour similar to that of their peers during crises. Chen et al. (2019) find that peer effects are determinants of cash policies in US manufacturing firms. Zhuang et al. (2022) find that firms with low cash reserves increase their cash levels in parallel with the increase in liquidity of their peers. These findings support the impact of information and rivalry-based mechanisms. In addition, Gao et al. (2011), who evaluate financial leverage decisions across geographical and competitive differences, find a 'local peer effect' that varies by firm location. The literature also emphasises that the peer effect is stronger in sectors with high levels of asymmetric information and intense competition (Ren et al., 2022; Warninda & Maryani, 2022).

Horvath (2020) argues that central banks shape their decisions on monetary policy transparency in line with other central banks' practices; thus, the peer effect also affects regulatory decisions. This type of effect may become even more sensitive, especially in times of crisis and put the stability of the financial system at risk.

Studies specific to the banking sector reveal the effects of peer effects on systemic risk and financial stability. Wang et al. (2021) showed that loan portfolios of Chinese commercial banks exhibit a peer effect, which can increase the risk of systemic bankruptcy, while Margaretic et al. (2021) found that small and foreign banks are more sensitive to the lending/borrowing decisions of large banks. Wang et al. (2023) emphasise that peer banks' risk levels shape bank risks and that this effect varies with market conditions. Parallel to the findings of Lee et al. (2017), who found that the leverage decisions of financial institutions are subject to peer effects more intensely than non-financial firms and that this effect is determinant in decision-making processes, Warninda and Maryani (2022) found that the financial leverage decisions of Islamic banks in Indonesia during the global financial crisis were strongly affected by the leverage structures of peer banks.

In addition to financial issues in the limited literature on peer effect in the banking sector; Malik et al. (2019) found that corporate social responsibility expenditures of banks in Bangladesh increased due to peer pressure, while Gangopadhyay and Nilakantan (2021), who addressed the issue in terms of its effects on information technology and corporate behaviours, found the existence of social learning processes and peer effect in the information technology investments of banks in Jordan; and found that the investment decision of one bank triggers other banks to make similar decisions.

The summarised literature reveals that the peer effect is a powerful mechanism that affects not only individual behaviour but also strategic decisions at the corporate and sectoral

level. Especially in the financial field, the peer effect plays a critical role in capital structure and risk management decisions. However, studies on the peer effect on bank leverage decisions are quite limited. In this context, the study offers several contributions: While peer effects on individual and firm decisions are frequently discussed in the literature, studies examining peer effects on bank decisions are limited. It offers originality by being among the very few studies in the literature to link bank leverage decisions to peer influence directly. Furthermore, literature has generally examined developed countries. It is the first study to analyse peer influence in the financial sector using Türkiye as an example, a developing country, and it is also distinctive in that it examines peer influence on bank leverage decisions, which are important for financial stability. At the micro level, it shows that bank leverage decisions are shaped by peer influence, while at the macro level, the findings offer policy implications for financial stability and regulatory authorities. In this context, the results will not only offer practical recommendations for bank managers to consider peer dynamics in their strategic decision-making processes, but will also yield insights for regulatory and supervisory authorities in their assessment of the issue.

4. Data and Methodology

This study aims to determine whether a peer effect exists among Turkish deposit banks and, if so, to quantify its magnitude, thereby providing decision-makers with important data on this subject. Annual financial data for 21 deposit banks for the period 2007-2022 were obtained from the Turkish Banks Association (TBB) database. All banks included in the analysis are deposit banks, established in Türkiye, have more than one branch, and have regularly provided data throughout the analysis period. Single-branch banks create significant deviations in this type of analysis. Development and investment banks were excluded from the scope due to their different resource structure. Banks headquartered in foreign countries and operating only as branches in Türkiye were not included in the sample because they only have branch characteristics. The banks covered in the analysis are presented in Table 1.

Table: 1
Turkish Deposit Banks Subject to Analysis

Code	Bank Name	Type	Code	Bank Name	Type	Code	Bank Name	Type
1	Akbank	Private	8	QNB Finansbank	Foreign	15	Türk Ekonomi Bank	Private
2	Alternatifbank	Private	9	HSBC Bank	Foreign	16	Türkiye Cumhuriyeti Ziraat Banka	Public
3	Anadolubank	Private	10	ICBC Türkiye Bank	Foreign	17	Türkiye Garanti Bank	Private
4	Arap Türk Bank	Foreign	11	ING Bank	Foreign	18	Türkiye Halk Bank	Public
5	Burgan Bank	Foreign	12	Şekerbank	Private	19	Türkiye İş Bank	Private
6	Denizbank	Foreign	13	Turkish Bank	Private	20	Türkiye Vakıflar Bank	Public
7	Fibabanka	Private	14	Turkland Bank	Foreign	21	Yapı ve Kredi Bank	Private

In the study, since the data set's structure is suitable for the panel format, the econometric model adopted the Panel-Corrected Standard Errors (PCSEs) method, a robust panel method, as the appropriate approach. The primary reason for using the PCSEs method in econometric analyses in this study is that preliminary tests of the panel data set revealed cross-sectional dependence, heteroscedasticity, and autocorrelation. First, the results of the

Pesaran (2004) CD test and the Breusch-Pagan LM test indicated significant cross-sectional dependence among the countries in the panel. This indicates that shocks arising from economic, financial, or structural similarities between countries affect one another and that the error terms are mutually dependent. If traditional panel data methods do not account for such dependencies, the estimated standard errors may become systematically biased and inconsistent. Furthermore, the results of the Breusch-Pagan/White test and the Wooldridge autocorrelation test indicate the presence of heteroscedasticity (varying variance) in the error terms and autocorrelation over time. Heteroscedasticity can lead to incorrect coefficient standard errors when error variances differ across countries. Autocorrelation, on the other hand, arises from the dependence of error terms within the same country over time and also undermines the reliability of standard errors. The PCSEs method developed by Beck and Katz (1995) is an estimation approach that corrects standard errors by simultaneously addressing these three issues (cross-sectional dependence, heteroscedasticity, and autocorrelation). One of the most important advantages of the method is that it produces efficient and robust results, especially in panel data settings where the time dimension (T) is long relative to the cross-sectional dimension (N). PCSEs provide more accurate standard error estimates compared to the Feasible Generalised Least Squares (FGLS) approach and eliminate the problem of overly optimistic (downward-biased) standard errors. The choice of the PCSEs method in this study contributed to the accurate determination of the statistical significance of the obtained coefficients, enhanced the reliability of the policy implications, and strengthened the predictive power of the model. Thus, the influence of peers' leverage ratios on banks could be more accurately presented. Econometric analyses were performed using Eviews and Stata 17. The variables used in this study were determined based on the literature and are shown in Table 2.

Table: 2
Definitions of Variables

Variable	**Definitions**
Dependent variable	
Bank Leverage Ratio	[1-(Equity / Total Assets)]
Independent variables	
Peer Leverage	[Peer Bank Leverage Ratios]
Control variables	
Bank size	[Logarithm of Total Assets]
Liquidity	[Liquid assets / Total Assets]
Risk	[Loss provisions / Total Assets]

Using the dependent and independent variables introduced in Table 2 and based on studies in the literature (Dang & Nguyen, 2021; Lee et al., 2017; Lucky & Nwosi, 2015; Warninda & Maryani, 2022; Yudaruddin, 2017), the model equation (1) was established. This model was estimated using panel data (i indicates the bank, t indicates the time). Thus, both interbank differences and changes over time can be considered. The dependent variable in the equation, $LEV_{i,t}$, represents the leverage ratio of banks in each period. β_0; The constant term indicates the leverage level outside the explanatory variables in the model. $PELEV_{i,t}$; expresses the leverage ratio of peer banks. The β_1 coefficient measures the existence and direction of the peer effect. $\sum CONT$ encompasses control variables at the bank level, such

as liquidity, bank size, and loss provisions. Finally, the error term $e_{i,t}$ represents other random factors not included in the model that may affect the bank's leverage ratio.

$$\text{Model: : } LEV_{i,t} = \beta_0 + \beta_1 PELEV_{i,t} + \sum CONT + e_{i,t} \quad (1)$$

The peer bank calculation for each bank in the model was performed using the following formula: for each bank, the average of the other banks was computed, excluding the bank itself, and this value was modelled as the "peer average." This calculation is expressed as in Equation (2):

$$y_i = (1 / (n - 1)) \times \sum x_j, j \neq i \quad (2)$$

In the panel analysis conducted, descriptive statistics were first calculated. Subsequently, the correlation between variables was examined. The ADF test was used to test the unit root levels of the variables. The hypothesis established for this purpose is as follows.

H_0: The series are unit roots (non-stationary).

H_1: It is a stationary series.

Decision criterion: H_0 is rejected when $p<0.05$ (Dickey & Fuller, 1979).

After determining the stationarity levels of the series in the next stage, cross-sectional dependence was examined. The Breusch-Pagan LM, Pesaran scaled LM, Bias-corrected scaled LM, and Pesaran CD tests were used for cross-sectional dependence. The hypothesis tested is as follows.

H_0: There is no cross-sectional dependence.

H_1: There is cross-sectional dependence.

Decision criterion: H_0 is rejected when $p<0.05$ (Yerdelen-Tatoğlu, 2020).

The basic hypothesis established for regression analysis and to be tested in the study is as follows:

H_0: Peer banks do not influence a bank's leverage decisions. ($\beta_1=0$).

H_1: Peer banks have an impact on a bank's leverage decisions. ($\beta_1\neq0$).

Decision criterion: H_0 is rejected when $p<0.05$ (Greene, 2002).

Finally, after determining the necessary method, panel regression analysis was performed. The test method used for this purpose is robust least squares.

5. Findings

Descriptive statistics values calculated for all variables used in the analysis are shown in Table 3. The number of observations, based on variables derived from 16 years of data from 21 deposit banks, is 336. As seen in Table 3, while the average leverage ratio of the 21 banks examined within the scope of the analysis is approximately 87,33%, the peer leverage ratios of the banks are similarly 87,23%. The average similarity levels of peer banks in the capital structure are remarkable. Similarly, the peer leverage standard deviation is low, and even here the peer effect is noticeable.

Table: 3
Descriptive Test Statistics

Variables	Mean	SD	Medyan	Min	Max	N
LEV	87.333	10.04	88.880	15.071	100.000	336
PELEV	87.229	3.551	89.185	78.736	92.154	336
SIZE	4.730	0.661	4.615	4.015	7.026	336
LIK	26.296	4.538	27.535	17.056	34.092	336
LP/TA	1.141	0.384	1.021	0.678	2.061	336

To investigate multicollinearity in the analysis, a correlation analysis was utilised, and the correlation coefficients between the independent and control variables are presented in Table 4. There is a negative relationship between LEV and LIK, ZARKŞ/TV (-0.207, i.e., 21%, and -0.012, i.e., 0.1%), while there is a positive relationship between PELEV (21%) and SIZE (0.3%). However, the correlations among the independent variables are not strong. This situation increases the reliability and interpretability of the model coefficients.

Table: 4
Correlation Analysis

	LEV	PELEV	LIK	SIZE	LP/TA
LEV	1				
PELEV	0.207	1			
LIK	-0.187	-0.569	1		
SIZE	0.003	0.006	-0.003	1	
LP/TA	-0.012	-0.05	-0.468	-0.163	1

The stationarity of all variables used in the study was tested using the Augmented Dickey-Fuller (ADF) unit root test. Since non-stationary series can lead to incorrect regression results, the series was tested for stationarity before analysis. The ADF test was preferred because it can account for different model specifications, including trend and constant terms, and is widely used in the literature. The unit root test results are presented in Table 5. According to the results, the variables are not stationary at the level but are stationary at the first difference, meaning they do not have a unit root.

Table: 5
ADF Unit Root Test Findings

	At level	**LEV**	**PELEV**	**LIK**	**SIZE**	**LP/TA**
Constant	t-stat.	0.089	0.495	0.495**	0.999	0.099*
Constant and Trending	t-stat.	0.2304	0.718	0.065	0.842	0.183
Without Constant and No Trend	t-stat.	0.578	0.933	0.032**	0.245	0.380
	First Difference	**d(LEV)**	**d(PELEV)**	**d(LIK)**	**d(SIZE)**	**d(LP/TA)**
Constant	t-stat.	0.041***	0.013***	0.010***	0.000***	0.005***
Constant and Trending	t-stat.	0.176*	0.043**	0.047**	0.000***	0.032**
Without Constant and No Trend	t-stat.	0.003***	0.002***	0.000***	0.000***	0.000***

*Note 1: *, **, *** represent 10%, 5% and 1% significance levels, respectively.*

Panel data models generally assume that the error terms are independent across units, but in some cases, errors can also be correlated across the cross-sectional dimension. Therefore, in this study, the presence of cross-sectional dependence on variables was tested using 4 methods. In this study, Breusch-Pagan LM (Breusch & Pagan, 1980), Pesaran scaled LM (Pesaran, 2004), Bias-corrected scaled LM (Pesaran, 2008), and Pesaran CD (Pesaran, 2004) methods were used, respectively.

Cross-sectional dependence findings are presented in Table 6. According to the cross-sectional dependence test results, there is cross-sectional dependence in all variables. Therefore, second-generation methods were used.

Table: 6
Cross-Sectional Dependency Findings

	LEV	**PELEV**	**LIK**	**SIZE**	**LP/TA**
Breusch-Pagan LM	907.215*	3149.189*	3327.026*	3359.375*	3304.172*
Pesaran scaled LM	32.996*	142.393*	151.071*	152.650*	149.955*
Bias-corrected scaled LM	32.296*	141.6931*	150.371*	151.950*	149.255*
Pesaran CD	15.334*	56.092*	57.680*	57.960*	57.477*

Note 2: Degrees of freedom for all variables are 210.

As the tests conducted in the study revealed horizontal section dependence, the Panel-Corrected Standard Errors (PCSEs) method, which is one of the Robust Panel methods, was applied as the appropriate test. PCSEs are a technique developed to correct for dependency. This method recalculates standard errors to account for dependence among observation units. This allows for more accurate standard errors by accounting for the dependence among error terms, thereby making the results more reliable. Using such correction methods is important for obtaining accurate results in panel data analysis. The test results are presented in Table 7. According to the model's probability results, the model is significant at the 5% level. Here, the LEV variable is the dependent variable, while the other variables are independent and control variables. According to the results, all variables in the model, except the LP/TA variable, are significant. Accordingly, the LEV variable is positively affected by the PELEV variable. The coefficient is 0.1669 and is statistically significant at the 1% level. This result indicates that banks' leverage ratios are positively influenced by their peers' leverage decisions, suggesting a strong, statistically significant peer effect. According to the regression results, based on equation (5) in the basic hypothesis established for this study, the H_0 hypothesis was rejected and $H_1$was accepted. Therefore, there is a peer effect in the leverage decisions of 21 Turkish deposit banks. Accordingly, a one-unit increase in peer

leverage ratios affects a bank's leverage ratio by approximately 17%. In the functioning of the financial system, bank leverage ratios are important factors that determine how much banks can increase their loans and how these decisions affect the riskiness of the banking sector (Christensen et al., 2011). In this sense, when peers increase their leverage, other banks may be influenced to imitate them, thereby increasing the sector's riskiness. Conversely, if a bank acts prudently by reducing its leverage ratio and its peers follow suit, reducing their leverage ratios as well, this can reduce the sector's riskiness because lower leverage indicates a more prudent, capital-intensive structure. The SIZE variable is also positively correlated with the LEV variable. The coefficient is 0.4492, which is statistically significant at the 10% level. This finding indicates that larger banks tend to use higher leverage. As banks grow larger, they tend to use more leverage. A negative relationship has been observed between the SIZE and LIK variables. The coefficient is -0.1610 and is statistically significant at the 1% level. This finding indicates that as liquidity ratios increase in Turkish banks, leverage levels decrease, meaning that banks with higher liquidity levels have lower debt levels. On the other hand, the relationship between the LP/TA variable, the last control variable in the model, and the LEV variable is not statistically significant. According to the analysis, the coefficient for the LP/TA variable is -0.9097, but it is not significant (p=0.114). As a result, this variable, used as a risk indicator, cannot statistically explain banks' leverage decisions.

Table: 7
Model Results

Variable	Coefficient	Std. Error	z-Statistic	Prob.
PELEV	0.166886	0.065767	2.537530	0.0112
LIK	-0.161034	0.058405	-2.757176	0.0058
SIZE	0.449206	0.266469	1.685769	0.0918
LP/TA	-0.909750	0.575633	-1.580435	0.1140
C	77.47886	7.470664	10.37108	0.0000
	Robust Statistics			
R-squared	0.075746	Adjusted R-squared		0.064577
Rw-squared	0.152671	Adjust Rw-squared		0.152671
Akaike info criterion	391.4598	Schwarz criterion		412.9697
Deviance	3575.173	Scale		3.051747
Rn-squared statistic	47.32361	Prob (Rn-squared stat.)		0.000000
	Non-robust Statistics			
Mean dependent var	87.33345	S.D. dependent var		10.04049
S.E. of regression	10.02681	Sum squared resid		33277.74

6. Conclusion and Recommendations

This study aims to determine whether peer influence affects leverage ratio decisions of Turkish deposit banks, identify its level if present, and provide decision-makers with important data on this subject. Within this scope, findings were obtained by applying the Panel-Corrected Standard Errors method to data from 21 deposit banks spanning 2007-2022. When the analysis results were examined, significant results were obtained for all variables except the LP/TA variable.

There is a positive relationship at the 5% significance level between the LEV and PELEV variables, which are the focus of the study. According to this result, banks are

affected by their peers' leverage decisions, and the effect is positive. It is seen that as their peers increase their leverage ratios, banks also increase their own leverage ratios. Similarly, Lee et al. (2017), Warninda and Maryani (2022), among the studies encountered in the literature on this subject, concluded that banks are influenced by their peers when making leverage decisions. Similarly, although a positive effect has been identified, the studies in question used different samples.

Leverage in banking is an indicator that shows the extent to which banks borrow relative to their equity capital. Although an increase in this ratio increases financial risk, it also indicates that banks' lending capacity has increased. In other words, it indicates how much they have increased their lending capacity or invested in the deposits and other liabilities they have collected. Banks' leverage decisions are determined not only by individual risk optimisation but also by competitive pressure, information signals, and market norms. In other words, when one bank shows a tendency to borrow more, other banks tend to adopt similar strategies. Therefore, based on this study's findings, the peer effect is one channel through which systemic risk spreads in the banking system. The fact that the peer leverage ratio is significant and positive indicates that banks align their leverage decisions not only with their own financial conditions but also with the decisions of other banks in the sector. This is both an important finding for financial stability and a critical warning for policymakers. It indicates that banks shape their borrowing and risk-taking behaviour not only independently but also by taking other actors in the sector into account. These findings reveal that bank leverage decisions are significantly related not only to internal factors but also to the leverage levels of other banks in the sector. However, this effect should not lead to decisions made solely by following others; it may be more appropriate for managers to base their decisions on analyses of fundamental indicators, such as their own bank's risk profile, liquidity position, and capital adequacy, when determining leverage levels. Internal mechanisms should require justification for decisions based on industry trends. At the macro level, to ensure financial stability, policymakers should take measures not only targeting individual banks but also addressing leverage trends across the entire sector. Positive peer effects can be a good indicator when the economy is doing well, but can lead to problematic outcomes during times of crisis. In this context, macro-prudential indicators that track leverage concentrations should be developed; behavioural synchronisations should be monitored, particularly during crisis periods, using early warning mechanisms. In the banking sector, the likelihood of risk contagion triggered by peer effects in financial institutions is high. Therefore, managers must carefully evaluate and manage both internal and peer-influenced decisions within their own scope of responsibility. In developing countries such as Türkiye, banks account for a large share of the financial system in terms of asset size. Given their importance in fund transfers and their fragile structure, the tendency toward peer effects in banks should be monitored.

The finding of a negative relationship between leverage and liquidity suggests that banks with high leverage may be more vulnerable to liquidity constraints. From a liquidity perspective, high liquidity tends to reduce risk-taking and encourage prudent balance sheet management. From the perspective of bank managers, liquidity management is critical not

only for payment capacity but also for creating sustainable leverage strategies. In line with this finding, it is recommended that banks align their liquidity strategies with their risk management policies in an integrated manner. For policymakers, counterbalancing measures such as targeted liquidity buffers for highly leveraged banks could be considered. Particularly within the macroprudential framework, developing regulations that monitor the leverage-liquidity balance and include preventive liquidity buffers for stress periods would be beneficial.

As banks grow larger, they tend to increase their leverage ratios. This can be explained by the fact that, as banks grow, they want to increase their borrowing. At the same time, bank size affects the leverage ratio. This is because large banks have greater opportunities to benefit from leverage, as they are well-known in the market (Gropp & Heider, 2010). Small banks incur higher borrowing costs than large banks do. Larger banks generally exhibit less volatility in their annual returns. This reduces the financial risks associated with them and, consequently, increases their ability to maintain a higher financial leverage ratio than smaller banks (AL-Shatnawi et al., 2021). As understood, high leverage indicates that the bank has grown by borrowing more, thus increasing its risk, while low leverage indicates a more cautious, capital-intensive structure. Like literature, this study also reveals that as bank size increases, leverage ratios rise, and that there is a positive interaction between the peer effect and financial leverage. The findings of this study regarding the relationship between liquidity and leverage are consistent with those in the literature by George (2015), Dinlersoz et al. (2019), Chatterjee and Eyigungor (2023), and Cincinelli et al. (2024). These studies also reveal a similarly positive relationship. Furthermore, similar results have been observed in studies on Turkish banking (Caglayan and Sak, 2010; Avcı and Çatak, 2016). The positive correlation between bank leverage and size in the study indicates that large banks tend to have higher debt levels in their capital structures, and that potential systemic risks may become more pronounced in them. From the perspective of bank managers, this result points to the need for more careful management of the risks associated with increasing leverage levels as size increases. It would be appropriate for large banks to develop stronger risk control mechanisms not only to leverage their scale advantages, but also to address potential loss scenarios arising from leverage. For supervisory and regulatory authorities, this finding raises the need for differentiated leverage limits or scale-based macroprudential policies for large banks. In particular, the excessive borrowing tendencies of systemically important banks should be regularly monitored, and, where necessary, the existing size-sensitive additional capital requirements should be reviewed with this perspective in mind.

Another finding of the study is that no statistically significant relationship was observed between the Loss Allowances/Total Assets variable, a measure of credit risk (Lucky & Nwosi, 2015), and the Leverage variable. This result may indicate that banks do not base their leverage decisions directly on credit risk indicators or that this relationship was not apparent during the sample period. Furthermore, leverage levels may be more influenced by factors such as market conditions, peer behaviour, and liquidity. This situation

indicates that credit risk policy tools may not be sufficient on their own to guide leverage decisions.

This study is one of the first to examine peer effects in the Turkish banking sector and aims to contribute to the limited international literature on this topic. When the findings are compared, the result that banks are affected by their peers' leverage decisions is consistent with Lee et al. (2017), Warninda and Maryani (2022), confirming the existence of a peer effect in banks' leverage decisions. In this context, it provides important data for strategic decision-making by managers of Turkish deposit banks. It also provides critical information for relevant regulatory decisions and supervisory processes, including oversight and supervision mechanisms. In conclusion, the development of policy frameworks by regulatory authorities that take into account the dynamic structures, including peer effects, in bank behaviour will contribute to the sector becoming more resilient and stable. Future studies investigating whether banks are influenced by their peers in their financial decisions could provide additional insights for both bank managers and policymakers regarding financial strategies.

References

Acosta-Smith, J. et al. (2020), "The leverage ratio, risk-taking and bank stability", *Journal of Financial Stability*, 74, 100833.

Adhikari, B.K. & A. Agrawal (2018), "Peer influence on payout policies", *Journal of Corporate Finance*, 48, 615-637.

AL-Shatnawi, H.M. et al. (2021), "The role of the size and growth rate of the bank in determining the effect of financial leverage on the profitability of Jordanian commercial banks", *Journal of Contemporary Issues in Business and Government*, 27(1), 1962-1978.

Avcı, E. & Ç. Çatak (2016), "Determinants of Bank Capital structure and procyclicality of leverage: An empirical analysis from Turkey", *Marmara Business Review*, 1(2), 41-57.

Avgouleas, E. (2015), "Bank leverage ratios and financial stability: A micro- and macroprudential perspective", Levy Economics Institute of Bard College, *Working Paper* No. 849.

Baglioni, A. et al. (2013), "Is the leverage of European banks procyclical?", *Empirical Economics*, 45, 1251-1266.

Bandura, A. & R.H. Walters (1977), *Social Learning Theory* (Vol. 1) (141-154), Englewood Cliffs, NJ: Prentice Hall.

Barth, J.R. & S.M. Miller (2018), "Benefits and costs of a higher bank 'leverage ratio'", *Journal of Financial Stability*, 38, 37-52.

Begenau, J. & T. Landvoigt (2022), "Financial regulation in a quantitative model of the modern banking system", *The Review of Economic Studies*, 89(4), 1748-1784.

Blum, J.M. (2008), "Why 'Basel II' may need a leverage ratio restriction", *Journal of Banking & Finance*, 32(8), 1699-1707.

Breusch, T.S. & A.R. Pagan (1980), "The Lagrange multiplier test and its applications to model specification in econometrics", *The Review of Economic Studies*, 47(1), 239-253.

Bursztyn, L. et al. (2014), "Understanding mechanisms underlying peer effects: Evidence from a field experiment on financial decisions", *Econometrica*, 82(4), 1273-1301.

Caglayan, E. & N. Sak (2010), "The determinants of capital structure: evidence from the Turkish banks", *Journal of Money, Investment and Banking*, 15(1), 57-64.

Chen, Y.W. et al. (2019), "Peer effects on corporate cash holdings", *International Review of Economics & Finance*, 61, 213-227.

Chatterjee, S. & B. Eyigungor (2023), "The firm size-leverage relationship and its implications for entry and business concentration", *Review of Economic Dynamics*, 48, 132-157.

Christensen, I. et al. (2011), *Bank Leverage Regulation and Macroeconomic Dynamics*, CIRANO-Scientific Publications 2011s-76.

Cincinelli, P. et al. (2024), "Is there an optimal level of leverage? The case of banks and non-bank institutions in Europe", *International Review of Financial Analysis*, 94, 103323.

Conlisk, J. (1980), "Costly optimizers versus cheap imitators", *Journal of Economic Behavior & Organization*, 1(3), 275-293.

D'Hulster, K. (2009), "The Leverage Ratio", The World Bank Group, Financial and Private Sector Development *Vice Presidency Note*, (11).

Dang, V.D. & K.Q.B. Nguyen (2021), "Monetary policy, bank leverage and liquidity", *International Journal of Managerial Finance*, 17(4), 619-639.

Dickey, D.A. & W.A. Fuller (1979), "Distribution of the estimators for autoregressive time series with a unit root", *Journal of the American Statistical Association*, 74(366a), 427-431.

Dinlersoz, E. et al. (2019), "Leverage over the life cycle, firm growth and aggregate fluctuations", *Working Paper*, 25226, National Bureau of Economic Research, Cambridge.

Doğan, M. (2016), *Davranışsal Finans ve Finansal Okuryazarlık*, Hiperlink.

DiMaggio, P.J. & W.W. Powell (1983), "The iron cage revisited: Institutional isomorphism and collective rationality in organization fields", *American Sociological Review*, 48, 147-160.

Fender, I. & U. Lewrick (2015), "Calibrating the leverage ratio", *BIS Quarterly Review*, December, 43-57.

Firestone, S. et al. (2017), "An Empirical Economic Assessment of the Costs and Benefits of Bank Capital in the US", *Finance and Economics Discussion Series* 2017-034, Washington: Board of Governors of the Federal Reserve System.

Francis, B.B. et al. (2016), "When do peers matter?: A cross-country perspective", *Journal of International Money and Finance*, 69, 364-389.

Gangopadhyay, P. & R. Nilakantan (2021), "Peer effects and social learning in banks' investments in information technology", *International Review of Economics & Finance*, 75, 456-463.

Gao, W. et al. (2011), "Does corporate headquarters location matter for firm capital structure?", *Financial Management*, 40(1), 113-138.

George, C. (2015), "Bank size, leverage, and financial downturns", FDIC Center for Financial *Research Paper*, (2015-01).

Greene, W.H. (2002), *Econometric Analysis, 4th Edition*, International Edition, New Jersey: Prentice Hall, 201-215.

Grill, M. et al. (2016), *The leverage ratio, risk-taking and bank stability*, European Central Bank.

He, W. & Q. Wang (2020), "The peer effect of corporate financial decisions around split share structure reform in China", *Review of Financial Economics*, 38(3), 474-493.

Horvath, R. (2020), "Peer effects in central banking", *IMF Economic Review*, 68, 764-814.

Jinkrawee, J. et al. (2023), "A matter of others' money: How cash holdings of other firms affect a firm's cash holding?", *International Journal of Emerging Markets*, 18(10), 3954-3972.

Kaustia, M. & S. Knüpfer (2012), "Peer performance and stock market entry", *Journal of Financial Economics*, 104(2), 321-338.

Kaustia, M. & V. Rantala (2015), "Social learning and corporate peer effects", *Journal of Financial Economics*, 117(3), 653-669.

Kiema, I. & E. Jokivuolle (2014), "Does a leverage ratio requirement increase bank stability?", *Journal of Banking & Finance*, 39, 240-254.

King, R.G. & R. Levine (1993), "Financial Intermediation and Economic Development", in: C. Mayer & X. Vives (eds.), *Capital Markets and Financial Intermediation* (156-189), Cambridge: Cambridge University Press.

Lahno, A.M. & M. Serra-Garcia (2015), "Peer effects in risk taking: Envy or conformity?", *Journal of Risk and Uncertainty*, 50, 73-95.

Leary, M.T. & M.R. Roberts (2014), "Do peer firms affect corporate financial policy?", *The Journal of Finance*, 69(1), 139-178.

Lee, C.C. et al. (2017), "Peer bank behavior, economic policy uncertainty, and leverage decision of financial institutions", *Journal of Financial Stability*, 30, 79-91.

Levine, R. (1996), "Foreign Banks, Financial Development, and Economic Growth", in: C.E. Barfield (ed.), *International Financial Markets: Harmonization versus Competition* (224-254), Washington, DC: AEI Press.

Lieber, E.M. & W. Skimmyhorn (2018), "Peer effects in financial decision-making", *Journal of Public Economics*, 163, 37-59.

Lieberman, M.B. & S. Asaba (2006), "Why do firms imitate each other?", *Academy of Management Review*, 31(2), 366-385.

Lucky, A.L. & A.A. Nwosi (2015), "Asset quality and profitability of commercial banks: evidence from Nigeria", *Research Journal of Finance and Accounting*, 6(18), 26-34.

Malik, M. et al. (2019), "Peer pressure, CSR spending, and long-term financial performance", *Asia-Pacific Journal of Accounting & Economics*, 26(3), 241-260.

Manski, C.F. (1993), "Identification of endogenous social effects: The reflection problem", *The Review of Economic Studies*, 60(3), 531-542.

Margaretic, P. et al. (2021), "Banks' interconnections and peer effects: Evidence from Chile", *Research in International Business and Finance*, 58, 101438.

Pesaran, M.H., et al. (2008), "A bias-adjusted LM test of error cross-section independence", *The Econometrics Journal*, 11(1), 105-127.

Posen, H.E. & D. Martignoni (2018), "Revisiting the imitation assumption: Why imitation may increase, rather than decrease, performance heterogeneity", *Strategic Management Journal*, 39(5), 1350-1369.

Ren, N. et al. (2022), "The Competitive Effects of IPOs on Industry Peers' Finance Contracting: Evidence from Bank Loans", *Review of Business*, 42(2), 50-75.

Scholtens, B. & D. Van Wensveen (2003), *The theory of financial intermediation: an essay on what it does (not) explain* (No. 2003/1), SUERF Studies.

Türküner, E. (2016), "Basel III Likidite Düzenlemeleri Çerçevesinde Türk Bankacılık Sektörünün Likidite Riskinin Ölçülmesi ve Modellemesi", *Türkiye Bankalar Birliği Yayınları*, 320.

Umapathy, T. (2024), "Behavioral Economics: Understanding Irrationality in Economic Decision-Making", *Migration Letters*, 21(S2), 923-932.

Wang, C. et al. (2021), "Peer effects of bank loan portfolio on systemic insolvency risk: evidence from China", *Applied Economics*, 53(30), 3457-3473.

Wang, P. et al. (2023), "Do peer effects matter in bank risk? Some cross-country evidence", *Journal of International Financial Markets, Institutions and Money*, 88, 101844.

Warninda, T.D. & A. Maryani (2022), "Do Peer Banks Affect Islamic Bank Financial Leverage Decisions?", *Jurnal Keuangan dan Perbankan Syariah*, 10(2), 102-113.

Xu, P. & B. Wu (2022), "Why over-guarantee crises always cluster? Exploring peer effect in financial distress", *Journal of Organizational Change Management*, 35(7), 1025-1046.

Yerdelen-Tatoğlu, F. (2020), *Panel Veri Ekonometrisi Stata Uygulamalı*, İstanbul: Beta Basım Yayım Dağıtım A.Ş.

Yudaruddin, R. (2017), "The impact of economic conditions on bank profitability of regional development bank in Indonesia", *International Journal of Applied Business and Economic Research*, 15(19), 1-12.

Zhuang, Y. et al. (2022), "Peer influence and the value of cash holdings", *Journal of Empirical Finance*, 69, 265-284.