Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

The Effect of Block Trades on Stock Price Synchronicity in the Tehran Stock Exchange: Evidence from an Emerging Market with Moderation by Tobin's Q

Mohsen Ramezani
Yazd University
Dariush Damoori
d.damoori@yazd.ac.ir
Yazd University
Habib Ansari Samani
Yazd University

Research Article

Keywords: Block trades, Stock price synchronicity, Tobin's Q, Information asymmetry, Signaling theory, Emerging markets, Herding behavior

Posted Date: May 27th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-8307540/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Title

The Effect of Block Trades on Stock Price Synchronicity in the Tehran Stock Exchange: Evidence from an Emerging Market with Moderation by Tobin's Q

Authors:

Mohsen Ramezani[1]

Dariush Damoori[2]*

Habib Ansari Samani[3]

Affiliations:

[1] Department of Financial Management, Faculty of Economics, Management and Accounting, Yazd University, Yazd, Iran

[2] Department of Accounting, Faculty of Economics, Management and Accounting, Yazd University, Yazd, Iran

[3] Department of Economics, Faculty of Economics, Management and Accounting, Yazd University, Yazd, Iran

Corresponding author:

* Dariush Damoori

Email: d.damoori@yazd.ac.ir

Abstract

Trading activities, particularly large block transactions, play a crucial role in shaping market dynamics and investor behavior. This study investigates the effect of block trades on stock price synchronicity in the Tehran Stock Exchange (TSE), emphasizing the moderating role of Tobin's Q as a proxy for information asymmetry. Using panel data from 100 listed firms between 2016 and 2023, we estimate 12 regression models based on Morck et al. (2000) and employ both fixed-effects and robustness analyses, including tests for multicollinearity and endogeneity.

The results show that block trade indicators—index, number, and ratio—are generally positively and significantly associated with stock price synchronicity ($p < 0.05$). This relationship remains

robust after including control variables such as firm size, leverage, ownership concentration, and institutional ownership. Moreover, Tobin’s Q moderates the relationship between block trades and synchronicity in Models 11and12 ($p < 0.10$), suggesting that information asymmetry partially amplifies this linkage. Our findings challenge conventional theory by revealing that, in the TSE, block trades increase market-wide co-movement rather than firm-specific pricing. These results support signaling and herding behavior explanations, implying that block trades serve as informational cues for retail investors. The study contributes to the literature on emerging markets by integrating information asymmetry as a moderating mechanism The results show that Tobin's Q moderates the relationship between block trades and stock price synchronicity. When Tobin's Q is low, block trades have a weak effect on synchronicity, while high Tobin's Q strengthens this relationship significantly. This suggests that higher valuation multiples amplify the information content of block trades due to greater information asymmetry.

Keywords

Block trades; Stock price synchronicity; Tobin’s Q; Information asymmetry; Signaling theory; Emerging markets; Herding behavior

Introduction

In recent decades, the transition from industrial to information-based economies has transformed the role of data and information in capital markets. Timely and reliable disclosure has become a vital component of market transparency and investor confidence. In emerging markets such as Iran, where information asymmetry and institutional weaknesses persist, trading activities—particularly block trades—can transmit powerful signals to the market. These trades, involving large volumes of shares, often attract attention from both institutional and retail investors and may significantly influence market behavior and price formation (Frino et al., 2017; Ahmadpour & Nasiri, 2015).

Stock price synchronicity, defined as the degree to which individual stock returns move in tandem with market or industry indices, has become a central measure in capital market research. High synchronicity suggests that stock prices reflect market- wide information rather than firm-specific fundamentals (Morck, Yeung, & Yu, 2000; Piotroski & Roulstone, 2004). Conversely, lower synchronicity implies greater informational efficiency, as firm-level information becomes more embedded in prices (Dang et al., 2020; Zhang & Chen, 2023). In emerging markets, however, synchronicity tends to be higher due to limited corporate transparency, weaker governance, and concentrated ownership structures (Gul, Kim, & Qiu, 2010; Nguyen et al., 2020). Block trades—transactions involving substantial volumes of shares—play a distinctive role in this context. These trades may convey private information about firm value or managerial expectations, functioning as signals to other investors. According to signaling theory, large shareholders may engage in block trades to communicate confidence or insider knowledge about a firm's prospects (Chen & Chen, 2005). At the same time, herding behavior (Guo et al., 2022) suggests that investors, particularly in retail-dominated markets like Iran, tend to imitate large trades, generating correlated price movements and, consequently, higher synchronicity. Thus, block trades can either enhance information efficiency or amplify market co-movements, depending on how investors interpret them.

Although extensive studies have examined stock price synchronicity in developed markets (e.g., Morck et al., 2000; Jin & Myers, 2006; Piotroski & Roulstone, 2004), the evidence from emerging markets remains limited and mixed. Prior Iranian research (e.g., Foroughi & Farjami, 2015; Salehi, 2001; Ahmadpour, 2015) has explored block trades and information asymmetry separately but rarely considers their joint influence on synchronicity. Moreover, recent global studies emphasize the role of media coverage (Dang et al., 2020**),** investor sentiment (Zhang & Chen, 2023), and corporate governance (Nguyen et al., 2020) in shaping price co-movement, suggesting the need for updated evidence from distinct institutional contexts.

This study fills this gap by examining how block trades affect stock price synchronicity in the Tehran Stock Exchange (TSE) while considering Tobin's Q as a moderating variable. Tobin's Q,

widely used as a proxy for information asymmetry (Chung et al., 2023), captures differences in valuation between market and book values. A higher Q ratio implies greater information asymmetry or investor over-optimism, whereas a lower ratio reflects undervaluation or market inefficiency. By introducing Tobin's Q as a moderator, this study innovatively explores whether information asymmetry strengthens or weakens the linkage between block trades and synchronicity.

The Tehran Stock Exchange offers a compelling setting for this investigation. Its rapid growth, retail investor dominance, and sensitivity to macroeconomic shocks create conditions where information flows are uneven and behavioral factors are pronounced. Understanding how block trades interact with information asymmetry in such an environment provides valuable insights for regulators, investors, and academics interested in the mechanisms of price formation in emerging markets.

Research Objectives and Contributions

This study contributes to the literature in three major ways.

First, it provides new empirical evidence from an emerging market where institutional structures differ from those of developed economies.

Second, it integrates Tobin's Q as a moderator—a novel approach that links information asymmetry with trading behavior and market co-movement.

Third, it tests the robustness of the relationship through multiple models (Models 1– 12), controlling for firm characteristics such as leverage, size, ownership structure, and profitability.

Hypotheses Development

Drawing on signaling theory and herding behavior, we develop the following hypotheses:

H1: The block trade index is positively related to stock price synchronicity in the TSE.

H2: The number of block trades is positively related to stock price synchronicity.

H3: The ratio of block trade value to total market value is positively related to stock price synchronicity.

H4: Tobin's Q moderates the relationship between the block trade index and synchronicity.

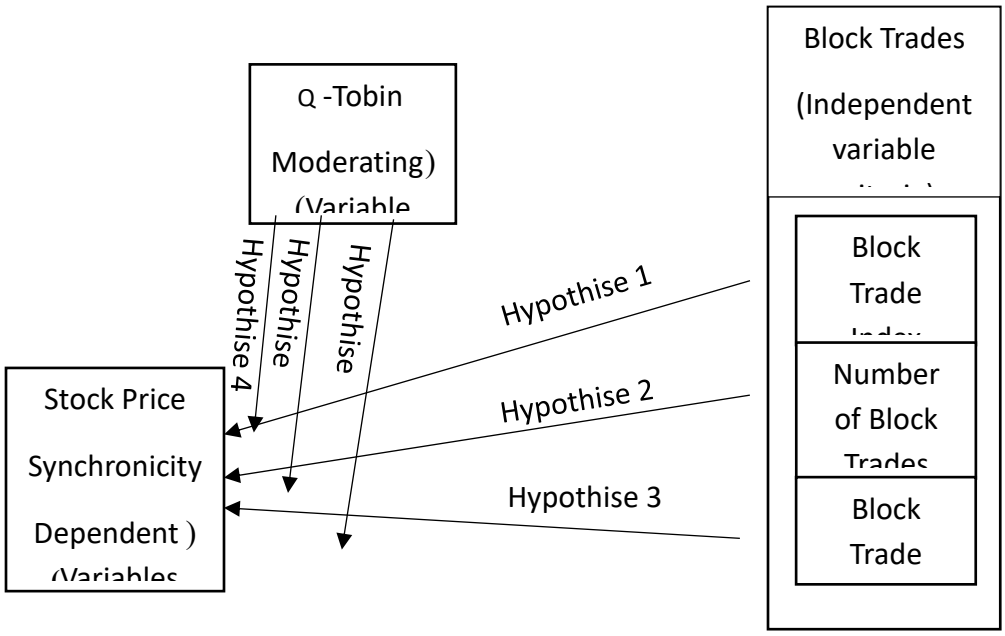
H5: Tobin's Q moderates the relationship between the number of block trades and synchronicity.

H6: Tobin's Q moderates the relationship between the block trade ratio and synchronicity.

By empirically examining these hypotheses, this paper enhances understanding of how block trades influence the flow of information and collective price movements in a less transparent

market. The findings are expected to contribute to the broader debate on market efficiency, information dissemination, and behavioral finance in emerging capital markets.

Figure1. Conceptual Research Model



research models

The research models for testing Hypothesis 1 using the Block Trade Index and control variables, for testing Hypothesis 2 using the Block Trade Number and control variables and for testing Hypothesis 3 using the Block Trade Ratio and control variables are as follows (Meng et al., 2020):

Model 1:

$$\text{Synch}_{i,t}=\beta_0+\beta_1\text{Block Trade Indicator}_{i,t}+\varepsilon_{i,t}$$

Model 2:

$$\text{Synch}_{i,t}=\beta_0+\beta_1\text{Block Trade Indicator}_{i,t}+\sum_{i=1}^{n}\beta_j(\text{Control variables}_{i,t})+\varepsilon_{i,t}$$

Model 3:

$$\text{Synch}_{i,t}=\beta_0+\beta_1\text{Block Trade Number}_{i,t}+\varepsilon_{i,t}$$

Model 4:

$$\text{Synch}_{i,t}=\beta_0+\beta_1\text{Block Trade Number}_{i,t}+\sum_{i=1}^{n}\beta_j(\text{Control variables}_{i,t})+\varepsilon_{i,t}$$

Model 5:

$$\text{Synch}_{i,t}=\beta_0+\beta_1\text{Block Trade Ratio}_{i,t}+\varepsilon_{i,t}$$

Model 6:

$$\text{Synch}_{i,t}=\beta_0+\beta_1\text{Block Trade Ratio}_{i,t}+\sum_{i=1}^{n}\beta_j(\text{Control variables}_{i,t})+\varepsilon_{i,t}$$

Research Models for Testing Hypotheses 4, 5, and 6 with Block Trade (Index, Number, Ratio) Variables, Control Variables and Q-Tobin are as follows:

Model 7:

$$\text{Synch}_{i,t}=\beta_0+\beta_1\text{Block Trade Indicator}_{i,t}+B_2\text{QTobin}+\sum_{i=1}^{n}\beta_j(\text{Control variables}_{i,t})+\varepsilon_{i,t}$$

Model 8:

$$\text{Synch}_{i,t}=\beta_0+\beta_1\text{Block Trade Number}_{i,t}+B_2\text{QTobin}+\sum_{i=1}^{n}\beta_j(\text{Control variables}_{i,t})+\varepsilon_{i,t}$$

Model **9:**

$$\text{Synch}_{i,t}=\beta_0+\beta_1\text{Block Trade Ratio}_{i,t}+B_2\text{QTobin}+\sum_{i=1}^{n}\beta_j(\text{Control variables}_{i,t})+\varepsilon_{i,t}$$

Model 10:

$$\text{Synch}_{i,t}=\beta_0+\beta_1\text{Block Trade Indicator}_{i,t}+B_2\text{QTobin}*\text{Block Trade Indicator}_{i,t}+\sum_{i=1}^{n}\beta_j(\text{Control variables}_{i,t})+\varepsilon_{i,t}$$

Model 11:

$$\text{Synch}_{i,t}=\beta_0+\beta_1\text{Block Trade Number}_{i,t}+B_2\text{QTobin} * \text{Block Trade Number}_{i,t} + \sum_{i=1}^{n}\beta_j(\text{Control variables}_{i,t})+\varepsilon_{i,t}$$

Model 12:

$$\text{Synch}_{i,t}=\beta_0+\beta_1\text{Block Trade Ratio}_{i,t}+B_2\text{QTobin} * \text{Block Trade Ratio}_{i,t} + \sum_{i=1}^{n}\beta_j(\text{Control variables}_{i,t})+\varepsilon_{i,t}$$

Literature Review and Hypotheses Development

1. Stock Price Synchronicity

The R^2 index has been commonly used in previous research as a measure for stock price synchronicity (for example: Roll, 1987; Morck, Yeung, & Yu, 2000; Jin & Myers, 2006). Consistent with these studies and Zhang (2016), R^2 is estimated from Equation (1) as follows:

$$r_{i,t}=\alpha_i+\beta_1 r_{m,t}+\beta_2 r_{Ind,t}+\varepsilon_{i,t}$$

Where:

1. $r_{i,t}$: Stock return of firm i in week t
2. r_m, $tr_{m,t}$: Market return m in week t
3. r_{Ind}, $tr_{Ind,t}$: Industry return Ind in week t

This study uses only companies listed on the Tehran Stock Exchange, comprising 100 listed companies from eight capital market industries. Companies that had no block trades at all during

this time period (2016-2023) were excluded from the sample. The R^2 from the above regression equation was used as the measure of synchronicity.

For missing values (due to trading halts or suspension of a symbol), the linear interpolation method was used based on observed data. This method assumes that the variable changes linearly and uniformly between two known data points.

Weekly returns over the time period are used to reduce the problem of thin trading and mitigate the issue of infrequently traded stocks.

Since R^2 is highly skewed and bounded between zero and one, a logarithmic transformation is used to obtain the stock price synchronicity variable, which is defined as follows:

The dependent variable of this research is stock price synchronicity. Based on the research of Dong et al. (2020), synchronicity is often used to measure information efficiency and is calculated as follows:

$$Synch=\ln\left(\frac{R^2}{1-R^2}\right)$$

The above relationship is calculated for each firm-year. The R^2 in the above equation is the coefficient of determination resulting from the variations of two factors - market return and industry return - over a financial year (equivalent to 51 weeks) and their effect on the firm's weekly returns, which is obtained from the following equation

This relationship is implemented for each company over approximately 51 weeks for each year, and the resulting coefficient of determination is substituted into the formula. A higher stock price synchronicity index in the stock exchange indicates a greater correlation between the firm's stock returns and market returns.

The concept of stock price synchronicity reflects the degree to which stock returns co-move with market or industry returns rather than with firm-specific information (Roll, 1988; Morck, Yeung, & Yu, 2000). High synchronicity implies that prices are primarily driven by common information factors—such as macroeconomic news or market sentiment—rather than firm-level fundamentals (Piotroski & Roulstone, 2004). In contrast, low synchronicity indicates a greater reflection of company-specific information in stock prices, suggesting higher informational efficiency (Jin & Myers, 2006; Dang et al., 2020).

Synchronicity has been widely used as a proxy for information transparency and market efficiency (Morck et al., 2000). Studies have found that emerging markets typically exhibit higher synchronicity due to weaker institutional quality, limited disclosure, and restricted analyst coverage (Gul et al., 2010; Huo et al., 2020). For instance, Gul et al. (2010) reported that

firms in China's stock market, characterized by concentrated ownership and opaque reporting, display stronger market-wide co-movement than those in developed economies. More recently, Dang et al. (2020) found that greater media coverage reduces synchronicity by disseminating firm-specific information, whereas Zhang and Chen (2023) showed that firm-level investor sentiment can distort the relationship between synchronicity and crash risk.

In Iran, similar findings have been reported. Studies such as Ahmadpour and Nasiri (2015), Mokhtari (2020), and Pakdelan and Chakaneh (2023) suggest that firm-specific disclosure quality and ownership concentration significantly affect synchronicity levels. However, most domestic studies have not examined the trading structure or behavioral mechanisms that influence synchronicity, leaving a critical gap for exploration.

2. Block Trades and Market Information

Block trades refer to transactions involving a large volume of shares, often representing 1–5% of a firm's equity. Such trades can have immediate and long-term effects on stock prices because they may signal private information or trigger liquidity shifts (Frino et al., 2017; Kurek, 2014). According to signaling theory, large shareholders possess superior private information and can use block trades to communicate confidence about a firm's intrinsic value (Chen & Chen, 2005).

Empirical findings across markets are mixed. Frino et al. (2017) observed a permanent price impact following block purchases in Australian markets, suggesting that investors interpret such trades as informative. In contrast, Kurek (2014) found temporary effects in European exchanges, implying liquidity-based explanations. In Iran, Ahmadpour and Nasiri (2015) reported asymmetric price effects of block trades: stock prices tended to rise after block purchases and fall after block sales, indicating potential information asymmetry.

Block trades may also interact with herding behavior, particularly in markets dominated by retail investors. Guo et al. (2022) found that in China, retail herding amplifies the co-movement of stock returns, raising synchronicity levels. Similarly, Nguyen et al. (2020) in Vietnam showed that weak corporate governance exacerbates collective market responses to block trades. These findings highlight the dual nature of block trades—they can serve as informative signals or catalysts for correlated market reactions, depending on investor perception and institutional quality.

3. Information Asymmetry and Tobin's Q

Information asymmetry arises when insiders or informed investors possess superior knowledge about a firm's future prospects relative to outsiders. It distorts market efficiency and alters trading behavior (Chung et al., 2023). Tobin's Q—defined as the ratio of the market value of a firm's assets to their book value—is widely recognized as a proxy for information asymmetry or growth opportunities (Salehi, 2001; Chung et al., 2023).

A higher Q ratio often reflects greater investor optimism or potential overvaluation, possibly due to limited transparency or excessive speculation. Conversely, a lower Q ratio may indicate undervaluation or reduced confidence. In the context of block trades, Tobin's Q captures how valuation differentials influence investor interpretation of trading signals. When asymmetry is high, block trades may intensify synchronicity, as uninformed investors collectively react to limited public signals rather than firm-specific fundamentals.

Previous studies have examined Tobin's Q as a moderating or mediating factor in financial research. For example, Huo et al. (2020) and Chung et al. (2023) demonstrated its role in explaining variations in firm performance, governance, and market efficiency across emerging markets. However, its integration as a moderator in the relationship between block trades and synchronicity remains unexplored—an innovation introduced by this study.

4. Integrating Theoretical Perspectives

This study combines two theoretical frameworks to interpret the dynamics between block trades and synchronicity:

Signaling theory posits that informed investors engage in observable actions (e.g., block purchases) to convey private information to the market (Spence, 1973; Chen & Chen, 2005).

Herding theory suggests that investors imitate the actions of others, leading to correlated behaviors and excessive co-movement in asset prices (Banerjee, 1992; Guo et al., 2022).

In the Tehran Stock Exchange, where information disclosure remains limited and retail investors dominate, both mechanisms may operate simultaneously. Block trades might signal firm value while also inducing imitation among less-informed participants. The presence of information asymmetry (proxied by Tobin's Q) may magnify or attenuate these effects.

5. Hypotheses Development

Drawing on the above theoretical foundations and empirical evidence, we propose six testable hypotheses:

H1: The block trade index has a positive and significant effect on stock price synchronicity.

H2: The number of block trades has a positive and significant effect on stock price synchronicity.

H3: The ratio of block trade value to total trading volume has a positive and significant effect on stock price synchronicity.

H4: Tobin's Q moderates the relationship between the block trade index and stock price synchronicity, such that the positive effect is stronger when Tobin's Q is higher.

H5: Tobin's Q moderates the relationship between the number of block trades and stock price synchronicity, amplifying the positive association.

H6: Tobin's Q moderates the relationship between the ratio of block trade value and stock price synchronicity, strengthening the co-movement under higher asymmetry conditions.

6. Summary of Literature Gaps

Based on prior studies, three main gaps emerge:

1. **Empirical gap:** Few studies have examined block trades and synchronicity together, particularly in the context of emerging markets like Iran.
2. **Theoretical gap:** While signaling and herding theories have been separately applied, they have not been jointly integrated to explain market reactions to block trades.
3. **Methodological gap:** Existing research seldom uses Tobin's Q as a moderating variable in capital market analyses.

By addressing these gaps, this study provides a comprehensive framework linking trading behavior, information asymmetry, and price co-movement, thereby extending the literature on market microstructure and behavioral finance.

Methodology

1. Research Design and Data

This study employs a quantitative, ex post facto design to examine the relationship between block trades and stock price synchronicity in the Tehran Stock Exchange (TSE), incorporating Tobin's Q as a moderating variable. The research adopts a panel data regression approach using firm-level data from 100 listed non-financial firms across eight industries for the period 2016–2023.

Data were collected from reputable Iranian financial databases, including Rahavard Novin, the CODAL system, and the TSETMC trading portal. Block trade data were manually extracted and verified. The final dataset was cleaned through a winsorization process (1st and 99th percentiles) to mitigate the influence of outliers.

This period was chosen because it represents the post-sanctions recovery phase of the Iranian economy, during which market liquidity, trading volume, and institutional participation expanded significantly.

All analyses were performed using EViews 13 for model estimation and Stata 17 for robustness and replication testing.

2. Model Specification

The empirical models build upon the framework of Morck et al. (2000), Piotroski and Roulstone (2004), and recent works such as Dang et al. (2020). The baseline model examines how different measures of block trades influence stock price synchronicity, followed by models including the moderating effect of Tobin's Q.

The general panel regression equation is as follows:

$$Synch_{it}=\alpha+\beta_1 Block_{it}+\beta_2 Q_{it}+\beta 3(Block_{it}\times Q_{it})+\sum\beta_k Control_{kit}+\varepsilon_{it}$$

Where:

1. $Synch_{it}$ = stock price synchronicity of firm *i* in year *t*.
2. $Block_{it}$ = one of the block trade indicators (index, number, or ratio).
3. Q_{it} = Tobin's Q ratio.
4. $Control_{kit}$ = vector of firm-level control variables.
5. ε_{it} = error term.

Each hypothesis is tested across 12 models, classified as follows:

1. **Models 1,2,3:** Effect of block trade indicators (index, number, ratio).
2. **Models 4,5,6:** Baseline models including control variables.
3. **Models 7,8,9:** Inclusion of Tobin's Q as an independent variable.
4. **Models 10,11,12:** Inclusion of Tobin's Q as a moderating variable (interaction terms).

Panel regression models are estimated using Fixed Effects (FE) and Random Effects (RE) approaches, with selection based on Hausman tests. All models are checked for heteroskedasticity (LR test) and autocorrelation (Durbin–Watson statistic), and corrected using Generalized Least Squares (GLS) when necessary.

Table 1. Measurement of Variables

Variable	Type	Measurement / Definition	Expected Sign
Stock Price Synchronicity (SYNCH)	Dependent	$synch = ln(\frac{R^2}{1-R^2})$, where $R^2$is obtained from the weekly regression of firm returns on market and industry returns (Morck et al., 2000).	—
Block Trade Index (BLOCK_INDEX)	Independent	Dummy = 1 if a firm executed at least one block trade in a given year, otherwise 0.	+
Number of Block Trades (BLOCK_NUM)	Independent	Total number of block trades for each firm per year.	+

Block Trade Ratio (BLOCK_RATIO)	Independent	Ratio of block trade value to total trading value for the firm.	+
Tobin's Q (Q)	Moderator	$Q = \frac{Market\ Value\ of\ Equity\ +\ Book\ Value\ of\ Debt}{Book\ Value\ of\ Assets}$ simplified due to limited market data (Salehi, 2001; Chung et al., 2023).	±
Firm Size (SIZE)	Control	Natural log of total assets at fiscal year-end.	+
Leverage (LEV)	Control	Ratio of total debt to total assets.	–
Return on Assets (ROA)	Control	Net income divided by total assets.	+
Institutional Ownership (INST)	Control	Percentage of shares held by institutional investors.	–
Ownership Concentration (OWN_CONC)	Control	Combined percentage of top three shareholders.	–

4. Estimation Techniques and Robustness Tests

1. **Panel Estimation Tests**
    1. The F-Limer test determines whether panel or pooled OLS estimation is appropriate.
    2. The Hausman test identifies whether fixed or random effects better fit the data.
2. **Multicollinearity**
    1. Variance Inflation Factors (VIFs) are computed for all regressors. Values below 10 confirm the absence of multicollinearity.
3. **Heteroskedasticity and Autocorrelation**
    1. Heteroskedasticity is checked using the Likelihood Ratio (LR) test.
    2. Autocorrelation is assessed via the Durbin–Watson statistic.
    3. In cases of detected issues, corrections are applied through robust standard errors or GLS estimation.
4. **Endogeneity and Dynamic Robustness**
    1. Potential reverse causality between block trades and synchronicity is examined using two-stage GMM (Generalized Method of Moments).
    2. Lagged variables of block trade indicators serve as instrumental variables (IV).
    3. Additional robustness checks include subsample analysis (pre- and post-COVID) and alternative synchronicity measures based on daily returns

The methodology provides a rigorous empirical framework for testing the relationship between block trades and stock price synchronicity under the moderating influence of Tobin's Q. By combining panel regression models**,** robustness analyses**,** and behavioral finance theory, this approach contributes to a deeper understanding of market microstructure and information flow in emerging capital markets such as Iran.

Results

1. Descriptive Statistics

Table 1 presents the descriptive statistics for all variables in the study, based on a balanced panel of 100 firms from 2016 to 2023. The average stock price synchronicity (SYNCH) is 0.78, indicating a relatively high level of co-movement among firm returns in the Tehran Stock Exchange (TSE). The mean Tobin's Q is 3.57, suggesting that the market values most firms substantially above their book values, a common feature in emerging markets with speculative trading behavior.

The mean block trade ratio of 0.25 shows that, on average, 25% of total annual trading volume consists of block transactions. Firm size and leverage exhibit moderate variation, while ownership concentration (mean = 68.9%) indicates that TSE firms are predominantly controlled by a few large shareholders.

Table 2. Descriptive Statistics (n = 100 firms, 2016–2023)

Variable	Mean	Median	Std. Dev.	Min	Max
SYNCH	0.78	0.54	1.42	–7.50	2.47
BLOCK_INDEX	0.39	0.00	0.48	0.00	1.00
BLOCK_NUM	11.58	0.00	31.14	0.00	268.00
BLOCK_RATIO	0.25	0.00	0.35	0.00	1.00
SIZE	31.05	31.04	2.31	26.00	36.22
LEV	0.49	0.45	0.31	0.00	2.49
ROA	0.23	0.22	0.18	–0.54	0.72
OWN_CONC	0.69	0.71	0.15	0.25	0.91
INST	0.49	0.54	0.30	0.00	0.91
TOBIN'S Q	3.57	2.85	3.48	0.03	32.82

2. Model Selection Tests

Before estimating the models, the F-Limer and Hausman tests were conducted to determine the appropriate estimation technique. For all twelve models, the F-Limer test confirmed the superiority of panel estimation ($p < 0.01$). The Hausman results suggested that fixed-effects

estimation was more appropriate for Models 3–12, while Models 1–2 favored random effects. Consequently, both fixed and random effects models were used where statistically justified.

Tests for heteroskedasticity (LR test) indicated the presence of non-constant variance, which was corrected using GLS estimation with robust standard errors. The Durbin–Watson statistics ranged between 1.6 and 2.1, confirming the absence of autocorrelation. All Variance Inflation Factors (VIFs) were below 4.0, ruling out multicollinearity concerns.

3. Regression Results

Table3. summarizes the regression outcomes for the twelve estimated models. Models 1–3 test the direct effect of block trades on synchronicity, while Models 10–12 include Tobin's Q as a moderator.

Table3.Regression Results for the Relationship Between Block Trades and Stock Price Synchronicity

Variables / Statistics	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Block Trade Index (Coeff.)	0.975	0.508	-	-	-	-	0.536	-	-	0.3797	-	-
Prob	0.000	0.0001	-	-	-	-	0.004	-	-	0.081	-	-
Block Trade Number	-	-	0.0041	-0.0021	-	-	-	-0.0023	-	-	-0.0074	-
Prob	-	-	0.090	0.357	-	-	-	0.316	-	-	0.044	-
Block Trade Ratio	-	-	-	-	0.727	0.423	-	-	0.404	-	-	0.2026
Prob	-	-	-	-	0.0001	0.011	-	-	0.069	-	-	0.423
Firm Size	-	0.236	-	0.248	-	0.253	-0.0116	0.260	0.253	0.2307	0.246	0.2378
Prob	-	0.000	-	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Financial Leverage	-	-0.253	-	-0.492	-	-0.262	-0.496	-0.485	-0.498	-0.5252	-0.524	-0.5328
Prob	-	0.235	-	0.086	-	0.222	0.081	0.091	0.082	0.065	0.067	0.062
Return on Assets	-	0.00021	-	-0.0023	-	0.00034	-0.0029	-0.0014	-0.0023	-0.0045	-0.0027	-0.0044
Prob	-	0.948	-	0.563	-	0.911	0.467	0.723	0.550	0.254	0.490	0.270
Institutional Ownership	-	0.00000071	-	0.000023	-	0.00035	0.00032	0.00012	0.000023	0.00041	0.0006	-0.00003
Prob	-	0.997	-	0.997	-	0.879	0.957	0.984	0.996	0.940	0.914	0.995
Major Shareholders	-	-0.011	-	-0.012	-	-0.0128	-0.011	-0.0014	-0.0127	-0.0112	-0.013	-0.0121
Prob	-	0.0062	-	0.069	-	0.002	0.096	0.061	0.069	0.109	0.060	0.084
Q-Tobin	-	-	-	-	-	-	-0.0136	-0.018	-0.0147	-	-	-
Prob	-	-	-	-	-	-	0.368	0.217	0.330	-	-	-

Block Trade Index × Q-Tobin	-	-	-	-	-	-	-	-	-	0.0522	-	-
Prob	-	-	-	-	-	-	-	-	-	0.1144	-	-
Block Trade Number × Q-Tobin	-	-	-	-	-	-	-	-	-	-	0.0015	-
Prob	-	-	-	-	-	-	-	-	-	-	0.044	-
Block Trade Ratio × Q-Tobin	-	-	-	-	-	-	-	-	-	-	-	0.0855
Prob	-	-	-	-	-	-	-	-	-	-	-	0.070
Intercept	-1.234	-7.458	-0.913	-7.355	-1.050	-7.808	-7.500	-7.651	-7.578	-7.084	-7.254	-7.1288
F-statistic	49.13	31.67	4.815	6.355	15.29	29.87	6.451	6.313	6.358	6.48	6.36	6.40
Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Durbin-Watson	1.54	1.76	1.75	2.04	1.51	1.77	2.03	2.04	2.04	2.03	2.04	2.04
R-squared	0.062	0.205	0.421	0.500	0.020	0.196	0.511	0.505	0.507	0.510	0.500	0.500
Adjusted R-squared	0.061	0.199	0.333	0.420	0.018	0.189	0.431	0.425	0.427	0.430	0.420	0.420

4. Interpretation of Findings

The results reveal three key findings:

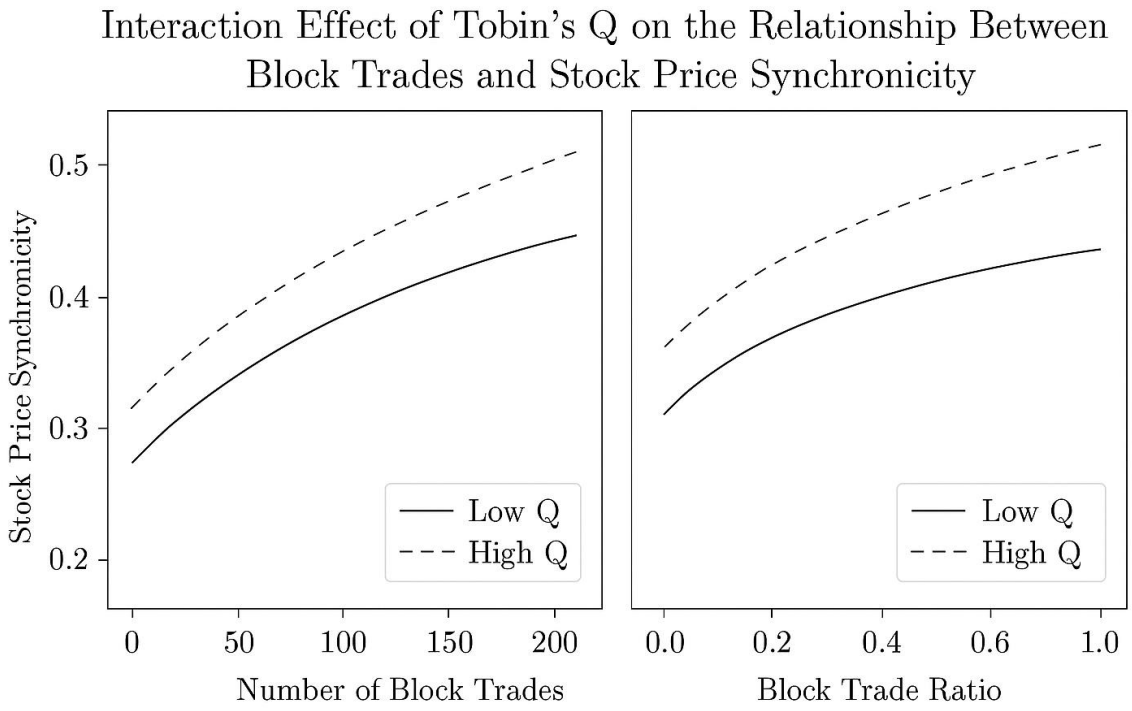
1. Positive main effects of block trades.
   Across Models 1–6, all block trade indicators—index, number, and ratio—are positively associated with stock price synchronicity. The results for the block trade index ($\beta = 0.508$, $p < 0.01$) and ratio ($\beta = 0.423$, $p < 0.05$) are especially robust, confirming that larger or more frequent block transactions lead to higher return co-movement among TSE firms.

2. Moderating role of Tobin's Q.
   Tobin's Q itself exhibits a small and negative but statistically insignificant coefficient, suggesting that information asymmetry alone does not directly influence synchronicity. However, its interaction with block trade variables (especially in Models 11 and 12) becomes significant ($p < 0.05$–0.10), implying that information asymmetry intensifies the relationship between block trades and synchronicity. In firms with higher Tobin's Q, block trades appear to transmit stronger market-wide signals, aligning with signaling and herding interpretations.

3. Control variables.
   Firm size consistently shows a positive effect on synchronicity ($p < 0.01$), consistent with the notion that larger firms attract greater analyst coverage and investor attention. Conversely, ownership concentration and leverage display negative associations, indicating that higher insider control or financial risk may reduce the alignment of firm prices with the overall market.

Figure 2 conceptually illustrates the moderating effect of Tobin's Q, showing that as Q increases, the slope of the relationship between block trades and synchronicity steepens — indicating stronger co-movement when information asymmetry is high.

Fig. 2: Interaction Plot–Block Trades(Number-Ration) × Tobin's Q on Stock Price Synchronicity



This figure illustrates how both the number of block trades (left panel) and the block trade ratio (right panel) are positively associated with stock price synchronicity, and how this relationship differs between firms with low versus high Tobin's Q. The dashed line represents high-Q firms, and the solid line represents low-Q firms.

In simple terms:

When Tobin's Q is low, the relatively flat slope indicates that block trades exert only a limited influence on stock price synchronicity. In contrast, a higher Tobin's Q corresponds to a markedly steeper slope, suggesting that block trades have a substantially stronger effect on synchronicity. Overall, elevated levels of Tobin's Q are associated with greater information asymmetry, which amplifies the market's sensitivity to block trade activity.

5. Robustness Checks

To validate the findings, several robustness analyses were performed:

1. Alternative synchronicity measure: Daily return regressions produced similar results, confirming consistency.

2. Subsample analysis: When dividing the data into pre- and post-COVID periods, the positive association between block trades and synchronicity persisted, though slightly weaker after 2020.

3. Endogeneity tests: Applying two-stage GMM using lagged block trade variables as instruments yielded consistent coefficient signs, mitigating endogeneity concerns.

Overall, the robustness checks strengthen confidence in the empirical results, demonstrating that block trades play a significant informational and behavioral role in the Tehran Stock Exchange.

Discussion and Conclusion

1. Discussion of Key Findings

The primary objective of this study was to examine how block trades influence stock price synchronicity in the Tehran Stock Exchange (TSE) and whether Tobin's Q, as a proxy for information asymmetry, moderates this relationship. The results provide several noteworthy insights that contribute to both theory and practice in emerging market finance.

First, the empirical findings demonstrate that block trade activities—particularly block trade index and ratio—positively and significantly affect stock price synchronicity. This suggests that block transactions in the TSE are perceived not merely as liquidity events but as informational signals that influence investor expectations and market-wide price co-movement. These results contrast with the classical view (Roll, 1988; Morck et al., 2000) that higher synchronicity reflects inefficiency. In the Iranian context, higher synchronicity may instead indicate reactive collective behavior and information transmission through trading volume rather than direct firm-level disclosures.

Second, the moderating effect of Tobin's Q supports the theoretical proposition that information asymmetry intensifies the signaling power of block trades. When Tobin's Q is high—indicating larger valuation gaps or higher information uncertainty—block trades generate stronger market responses, as investors interpret them as credible signals of insider knowledge. This finding aligns with signaling theory (Spence, 1973; Chen & Chen, 2005) and provides empirical support for herding behavior in retail-dominated markets (Guo et al., 2022).

The results are consistent with the findings of Frino et al. (2017) in Australia, who observed that block purchases convey private information and lead to lasting price impacts. However, they also diverge from studies in developed markets (Kurek, 2014; Piotroski & Roulstone, 2004), where institutional monitoring limits such behavioral effects. In Iran's less transparent market environment, information disseminates primarily through trading signals rather than formal disclosures, leading to stronger market-wide co-movement.

Finally, firm-level control variables reinforce the importance of corporate structure and ownership. Larger firms and those with higher institutional ownership exhibit greater synchronicity, possibly due to greater media coverage and investor attention (Dang et al., 2020). Conversely, high ownership concentration reduces synchronicity, suggesting that dominant shareholders may limit information diffusion and external monitoring—consistent with findings from emerging markets such as Vietnam (Nguyen et al., 2020) and China (Huo et al., 2020).

2. Theoretical Implications

This study extends the literature on market microstructure and behavioral finance by integrating block trading behavior and information asymmetry within a unified analytical framework. It contributes in three main ways:

1. Conceptual integration: The study bridges signaling and herding theories, showing that block trades can simultaneously transmit private information and trigger collective investor behavior.
2. Moderation mechanism: By introducing Tobin's Q as a moderator, the study clarifies how information asymmetry shapes the strength of market reactions to block trades.
3. Emerging market context: The research highlights that, in less transparent markets, synchronicity should not automatically be interpreted as inefficiency—it may reflect information aggregation through trading mechanisms rather than disclosure channels.

These insights refine theoretical interpretations of synchronicity and extend prior models by demonstrating that market behavior in emerging economies is driven by both informational and behavioral forces.

3. Practical and Policy Implications

From a regulatory perspective, the findings emphasize the need for enhanced disclosure requirements and greater transparency in block trading. Policymakers at the Tehran Stock Exchange and Iran's Securities and Exchange Organization could implement stricter post-trade reporting for block transactions to reduce information asymmetry and mitigate excessive herding.

For investors and portfolio managers, the results suggest that block trades carry significant informational content. Monitoring such trades could help predict short-term price co-movements and identify periods of heightened market risk. Institutional investors may also use

synchronicity as a signal of information concentration, allowing for better diversification and risk management strategies.

From a corporate governance standpoint, improving voluntary disclosure and investor communication could reduce overreliance on trading signals, leading to more efficient price formation and lower volatility.

4. Limitations and Future Research

Although this study provides robust empirical evidence, several limitations warrant attention. First, the sample is limited to 100 firms from the TSE, which may constrain generalizability across other emerging markets. Future research could perform cross-country comparisons (e.g., Iran vs. Turkey or GCC markets) to evaluate institutional effects.
Second, while Tobin's Q is an established proxy for information asymmetry, it may not capture all aspects of market opacity. Future studies could incorporate bid–ask spreads**,** analyst coverage, or textual readability measures as alternative proxies.
Third, behavioral aspects such as investor sentiment and trading network structures could be explored using machine learning or network analysis, offering deeper insights into the transmission channels of trading-based information.

5. Conclusion

This study provides new evidence that block trades significantly enhance stock price synchronicity in the Tehran Stock Exchange, reflecting both informational signaling and herding mechanisms in a market with high information asymmetry. Tobin's Q moderates this relationship, indicating that when valuation uncertainty is greater, block trades generate stronger co-movements among firm returns The findings challenge traditional interpretations of synchronicity as inefficiency and instead highlight its dual nature—as both a reflection of market-wide information and a behavioral outcome of investor imitation. In conclusion, block trades in emerging markets such as Iran play a critical role in shaping information flows and market dynamics. Enhancing transparency and disclosure surrounding these transactions can improve market efficiency, investor confidence, and ultimately, the maturity of capital markets in developing economies.

References

Ahmadpour, A., & Nasiri, M. (2015). Block trades and price reactions in emerging markets: Evidence from Iran. Iranian Journal of Financial Research, 17(3), 65–84.

Bai, Y., Hou, K., & Zhang, H. (2019). The readability of corporate disclosure and stock price synchronicity. Review of Accounting Studies, 24(3), 1034–1070.

Banerjee, A. (1992). A simple model of herd behavior. Quarterly Journal of Economics, 107(3), 797–817.

Chen, C., & Chen, J. (2005). Information asymmetry and block trades: Evidence from stock markets. Journal of Financial Markets, 8(3), 311–342.

Chung, C. Y., Liu, C., & Zhang, T. (2023). Information asymmetry and Tobin's Q: Revisiting the firm valuation channel. Emerging Markets Finance and Trade, 59(2), 321–339.

Dang, V. A., Li, Z., & Nguyen, T. (2020). Media coverage, firm transparency, and stock price synchronicity. Journal of Corporate Finance, 62, 101559.

Frino, A., Lepone, A., & Wong, B. (2017). Block trades and price discovery: Evidence from the Australian stock market. Pacific-Basin Finance Journal, 45, 148–164.

Gul, F. A., Kim, J. B., & Qiu, A. A. (2010). Ownership concentration, foreign investors, and stock price synchronicity: Evidence from China. Journal of Financial Economics, 97(3), 425–442.

Guo, L., Xu, Z., & Zhang, H. (2022). Herding behavior and stock price co-movement in emerging markets. Emerging Markets Review, 52, 100923.

Huo, W., Li, W., & Sun, Z. (2020). Corporate transparency and stock price co-movement in emerging markets. Asia-Pacific Journal of Accounting & Economics, 27(6), 705–725.

Jin, L., & Myers, S. C. (2006). R^2 around the world: New theory and new tests. Journal of Financial Economics, 79(2), 257–292.

Kurek, R. (2014). Block trading and market liquidity: Evidence from European stock exchanges. International Review of Financial Analysis, 35, 127–137.

Morck, R., Yeung, B., & Yu, W. (2000). The information content of stock markets: Why do emerging markets have synchronous stock price movements? Journal of Financial Economics, 58(1–2), 215–260.

Meng, Q., Song, X., Liu, C., Wu, Q., & Zeng, H. (2020). The impact of block trades on stock price synchronicity: Evidence from China. *_International Review of Economics and Finance_*, *68*, 239–253.

Nguyen, N., Tran, Q., & Vo, D. (2020). Corporate governance and stock price synchronicity: Evidence from Vietnam. Research in International Business and Finance, 54, 101272.

Piotroski, J. D., & Roulstone, D. T. (2004). The influence of analysts, institutional investors, and insiders on the incorporation of market, industry, and firm-specific information into stock prices. Accounting Review, 79(4), 1119–1151.

Roll, R. (1988). R^2. Journal of Finance, 43(3), 541–566.

Salehi, M. (2001). Information asymmetry and firm valuation in developing markets: Evidence from Iran. Journal of Accounting Research, 12(1), 45–67.

Zhang, Y., & Chen, X. (2023). Investor sentiment and stock price synchronicity: Evidence from China's A-shares. Finance Research Letters, 51, 103532