Business groups and information leakage in equity markets

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This draft: April 11, 2025

Preliminary and incomplete

Abstract

This paper investigates whether brokerage houses affiliated with business groups actively leverage private information about publicly traded banks during earnings announcements in the Turkish stock market between 2009 and 2015. Unlike many previous studies, our setting allows us to identify traders in the intraday limit order book at the broker level. This enables us to analyze whether the total and net trade flow of bank-affiliated brokerage houses—potentially possessing insider information—differs from that of unaffiliated brokerage houses around banks' earnings announcements. We document a statistically significant increase in the net (buy-sell) trade flow passing through affiliated brokers in the pre-announcement period in a daily panel setting where we control for potential heterogeneity across brokers, banks, and time. To the extent that trade imbalances proxy information asymmetry, these findings suggest substantial informed trading activity passing through group-affiliated brokerage houses before earnings releases. Informed trading activity is more evident in announcements with good news for the underlying bank. The results contribute to our understanding of how information flow influences market quality in financial markets. The findings highlight the active role of business group-affiliated brokers in shaping the dissemination of information, extending beyond merely executing trades in order-driven markets.

Keywords: *Business groups, brokerage houses, financial conglomerates, information leakage, order-driven markets*

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1 Introduction

This paper examines whether business group-affiliated brokerage houses actively use the private information they possess about publicly traded banks around earnings announcements in the Turkish stock market, Borsa Istanbul (BIST), between 2009 and 2015. Business groups are formed when several different firms operating in various industries come together via formal and informal ties. The group-affiliated firms tend to be considerably large and systematically important in many emerging economies like Turkey, while the degree of diversification of business groups tend to vary across different countries. Large shareholders have the incentive and, in most cases, control right to appoint "right-hand" managers, which enables them to directly monitor the managerial activities/corporate decisions within the business group.

Turkey provides a distinct opportunity to investigate business group affiliation on information dissemination in secondary markets as the ownership structure in public firms is highly concentrated, and corporate control is centralized. A significant proportion of the public corporations in BIST operate under a business group. In particular, every private bank established in Turkey is part of a business group, ultimately owned and managed by a family (Yurtoglu, 2000). While some groups sold their banks to foreign investors in recent years, the tendency for large business groups to structure themselves around a commercial bank continues to be prominent. This tendency aligns with the standard theoretical arguments that predict business groups' significant involvement in the financial sector as a substitute for imperfect capital markets (Leff, 1978; Khanna and Yafeh, 2007).

More importantly, unlike many prior studies, our setting enables us to distinguish traders in the intraday limit order book at the broker level for BIST stocks. Therefore, we are able to analyze whether the total and net trade flow of brokerage houses affiliated with banks, which potentially have access to private information, differ from that of unaffiliated brokerage houses around banks' earnings announcements.

BIST is an order-driven market where the buy and sell order is matched electronically by price and time priority (Aktas and Kryzanowski, 2014). The Capital Market Law in Turkey

mandates that all publicly traded firms disclose their corporate announcements first on the fully electronic and centralized disclosure system, the Public Disclosure Platform (PDP), which provides reliable and accurate identification of exact time stamps on corporate announcements (Simsir and Simsek, 2022). During our sample period, no broker serves as a designated market maker. Moreover, there is no heterogeneity across investors vis-à-vis order submission or trade execution latency. Therefore, none of the brokerage houses in our sample serve as voluntary market makers. These attributes allow us to isolate the role of business group affiliation in disseminating private information about corporate earnings.

We form a sample of 450 earnings announcements for all publicly traded banks between 2009 and 2015 and classify each announcement as "good" or "bad" news, depending on whether earnings per share of a given bank is higher or lower than the industry median. Alternatively, we use analyst forecasts to classify the news, and the results remain largely unchanged. Our results indicate that the 20-day cumulative average abnormal return, CAR(-20,0), before good earnings releases, is positive (around 1.5%) and statistically significant at a 1% level. In contrast, we fail to reject the hypothesis that the CAR(-20,0) before bad earnings releases differs from zero.

We further observe a significant post-announcement drift, which captures the tendency of a stock's CAR to drift in the direction of earnings surprise following the announcement. For bad earnings releases, the 40-day cumulative average abnormal return, CAR(-20,20), is -1.5% and statistically significant at the 1% level. We also observe partial post-announcement drift for good earnings releases. However, the post-announcement drift is much more evident for events that carry bad news. Irrespective of the content of the earnings announcements (i.e., whether they convey good or bad news), the price reaction is considerably more limited compared to responses observed on developed markets (Vega, 2006). The smaller magnitude of price reaction may also be attributable to information leakage problems, particularly evident in BIST (Hekimoğlu and Tanyeri, 2011; Simsir and Simsek, 2022).

More importantly, we explore business group affiliation as a plausible mechanism for the information leakage problem for publicly traded Turkish banks. We expect that the clients of brokerage

houses in the same business groups as the underlying bank to initiate net buy [sell] positions on the bank stock earlier than the good [bad] earnings release compared to the clients of the unaffiliated brokers.

Our results indicate a statistically significant increase in the net trade flow passing through affiliated brokers, which are more likely to be informed due to their business ties, in the pre-announcement period. In a daily panel regression setting where we control for potential unobserved heterogeneity across brokers, banks, and time, we show that the net trade flow passing through business group-affiliated brokerage houses in the pre-announcement period increases by 15% on average, suggesting that the rise in trading activity is also economically significant. To the extent that trade imbalances proxy for information asymmetry, these findings suggest substantial informed trading activity passing through group-affiliated brokerage houses before earnings releases. The informed trading activity is more evident in the earnings announcements, which carry good news for the underlying bank and align with the average price reaction. In particular, for banks that announce earnings per share higher than the industry median, the net trade flow through affiliated brokerage houses in the pre-announcement window increases by 38%. In contrast, we observe no significant change in the net trade flow when the announcement carries bad news.

The asymmetry in the information content of affiliated brokerage houses is consistent with the prior literature, which demonstrates an asymmetric price impact of institutional investors. These studies argue that such asymmetry may arise because stock sale decisions are motivated by liquidity-related reasons rather than information-based decisions (Chan and Lakonishok, 1993; Keim and Madhavan, 1995; Griffiths et al., 2000; Saar, 2001). Irrespective of the news content, we observe no change in the total (buy+sell) trade volume passing through group-affiliated brokers in the pre-announcement window, which implies that our main results cannot be attributed to heightened trading activity around corporate events.

We then explore two additional types of brokers through which private information may be disseminated to financial markets. First, we explore whether foreign brokers have an information

advantage over domestic brokers in trading Turkish bank stocks around earnings releases. During our sample period, foreign investors dominate the Turkish stock market, holding almost 65% of the publicly traded shares in BIST. On the one hand, customers of foreign brokerage houses that operate in BIST may be large foreign institutional investors with significant investment expertise and experience in international markets, which may give an advantage over the customers of domestic investors (Froot and Ramadorai, 2008). On the other hand, foreign investors face linguistic and cultural barriers and, therefore, may be disadvantaged compared to customers of local brokerage houses due to differences in accounting standards and country-specific legal environment (Choe et al., 2001). Our results suggest that while the total trade volume passed through foreign brokerage houses on average increases (decreases) around good (bad) earnings releases, there is no significant change in the net trade flow, suggesting no superior information associated with foreign brokerage houses.

Next, we explore whether brokerage houses affiliated with state banks have an informational advantage about the state banks' prospects over the others around earnings releases. Three of the banks in our sample are state banks owned by the Turkish government. State-affiliated brokerage houses may have an informational edge over others due to their superior access to private information through institutional or political connections (Fisman, 2001; Acemoglu et al., 2016). Like foreign brokerage houses, we observe no significant change in the informed trade flow passing through brokerage houses affiliated with the state banks around earnings releases. Therefore, our main results do not seem to be primarily driven by state-affiliated brokerage houses in our sample.

Overall, our findings suggest that the private information about earnings announcements is (at least in part) disseminated by the business group affiliated brokerage houses, particularly when the earnings release carries positive news about the underlying bank. To the best of our knowledge, this paper is the first to propose business group affiliation as an information dissemination mechanism in secondary markets. Consequently, we argue that business group affiliations may lead to the disclosure of private information by group-affiliated brokerage houses before corporate events,

even in order-driven markets where brokers are assumed to be passive agents, simply transmitting clients' orders to the exchange.

Our results contribute to the literature on insider trading, which reports significant price and volume impact of illicit trades by insiders (Meulbroek, 1992; Chakravarty and McConnell, 1999; Fishe and Robe, 2004) as well as legal insider trades (Aktas et al., 2004; Inci et al., 2010; Inci and Seyhun, 2012). McNally et al. (2017) emphasize brokers tipping their clients about insider trades, while Barbon et al. (2019) argue that brokers can leak information about the order flow of connected clients. Simsir and Simsek (2022) examine the short-term impact of legal insider trading on the price discovery process for BIST. In many emerging markets, including BIST, informed trading activity is observed several days before the official announcement of corporate events. Prior studies refer to insider trading, tipping, and other methods of disseminating private information as sources of information leakage before corporate events (Bhattacharya et al., 2000; Bhattacharya and Daouk, 2002; Hekimoğlu and Tanyeri, 2011; Griffin et al., 2012; Arslan and Simsir, 2016), even though the identity of informed investors is not known. These studies rely on the endogenous classification of informed traders, which may depend on the interaction between different types of traders (Menkveld and Saru, 2024). In our context, by linking the net trade flows, a proxy for the informativeness of trades, with the exogenous group affiliation between banks and brokerage houses, we provide a direct economic mechanism for disseminating private information before earnings announcements.

We also contribute to the literature examining the role of intermediaries in order-driven markets where there are no designated or voluntary market makers. In such trading environments, classical market microstructure models assume brokers to be passive agents whose primary role is to transmit clients' orders to the exchange (Harris, 2002). While numerous studies focus on the price discovery process in order-driven settings (Parlour, 1998; Ranaldo, 2004; Foucault et al., 2007; Cao et al., 2009), the number of studies examining brokers' roles as information aggregators remains limited. The increasing prevalence of order-driven markets globally might suggest that, in secondary markets, the information aggregating role of brokers in the price discovery process

may be restricted in the future. Yet, our results indicate that business group affiliations may be an important channel through which private information is aggregated by brokers around earnings announcements. Our findings suggest that even in order-driven settings without designated (or voluntary) market makers, intermediaries can significantly influence information dissemination and market quality in financial markets.

2 Data

2.1 Turkish banks and business groups

Our sample consists of all commercial and investment banks publicly traded in Borsa Istanbul (BIST) between January 2009 and November 2015. There are 19 different bank tickers traded in BIST during our sample period[1]. For each bank in our sample and each quarter, we observe the majority shareholder in the bank's financials obtained through PDP and BIST Datastore. We then trace the brokerage subsidiary of a given bank. Matching banks and brokerage subsidiaries is rather straightforward. Commercial and investment banks (that are already part of a business group) are usually structured as financial conglomerates with various operations, such as insurance companies, closed-end funds, brokerage firms operating in BIST, and even real estate investment trusts. Many subsidiaries with financial conglomerates actively use the name of the parent bank to benefit from its reputation. Table 1 provides information regarding the banks in our sample, along with the business group-affiliated brokerage houses.

Insert Table 1

A bank may have multiple affiliated brokerage houses. This can happen in two ways: First, a bank may have a foreign owner in addition to the controlling shareholder. For example, Citibank had a significant share in AKBANK (AKBNK) during our sample period. Therefore, we label Citi Menkul Degerler A.S. (CIM), the broker subsidy of Citibank, as another affiliated broker

[1]We account for the changes in stock tickers throughout our sample period using the information provided by the BIST (http://www.borsaistanbul.com/datum/payadvekoddegisiklikleri.zip)

of AKBNK along with the group affiliated broker AK Yatirim Menkul Degerler A.S. (AKM)[2]. Second, a bank may be owned by the Turkish government. In this case, we label that bank as affiliated with brokerage houses of three major government banks (T. Halk Bankasi A.S., Turkiye Vakiflar Bankasi A.S., and Turkiye Ziraat Bankasi A.S.). For example, Turkiye Vakiflar Bankasi A.S. (VKBNK) has Vakif Yatirim Menkul Degerler A.S. (VKY), which operates as its brokerage subsidiary in BIST. However, we set VKBNK to be affiliated with VKY, along with Halk Yatirim Menkul Degerler A.S. (HLY) and Ziraat Yatirim Menkul Degerler A.S. (ZRY). Finally, we set Albaraka Turk Katilim Bankasi A.S. (ALBRK) with Oyak Yatirim Menkul Degerler A.S. (OYA) since all brokerage operations of ALBRK are conducted by OYA[3].

2.2 Earnings announcements

For each of the stocks in our sample, we obtain earnings announcement dates and the corresponding financials from the PDP website and BIST Datastore. Each earnings event in our sample contains the announcement date and the earnings per share (EPS) levels[4]. For any given announcement in the event sample, the corresponding EPS level is matched according to the ticker and quarter-year. For example, for an announcement made in May 2009, we label the EPS level of the given bank as pertaining to 2009-Q1.

An event is labeled as "bad news" if the EPS is negative. If EPS is positive for a given bank, we compare the EPS level with the median industry EPS for the given quarter. If, for a given bank in a given quarter, the EPS level is greater (less) than the industry median, then that event is labeled as "good news" ("bad news"). If the EPS level is unavailable for a given announcement, we do not

[2]Similar relationships are observed for Yapi ve Kredi Bankasi A.S. (YKBNK) and Unicredit, which had brokerage operations in BIST through Unicredit Menkul Degerler A.S (UCI). In our sample, YKBNK is part of the Koc Holding group, which historically had independent brokerage house operations under Koc Yatirim Menkul Degerler A.S. (KCM). Therefore, we set YKBNK to be affiliated with Yapi Kredi Yatirim Menkul Degerler (YKR), along with UCI and KCR. Turkiye Sinai Kalkinma Bankasi A.S. (TSKB) has its brokerage house subsidiary TSKB Menkul Degerler A.S. (TSM). However, the majority owner of TSKB is Is Group, which also has the brokerage house Is Yatirim Menkul Degerler (IYM) operating under Is Bankasi A.S. (ISCTR). Therefore, we set IYM also to be group-affiliated with TSKB

[3]See https://www.albaraka.com.tr/tr/bireysel/yatirim/sermaye-piyasasi-urunleri/hisse-senedi-islemleri (in Turkish, last access: October 28, 2024)

[4]EPS is the portion of a bank's profit allocated to each shareholder. It is calculated based on the net income available to common shareholders divided by the number of shares outstanding.

classify that announcement as good or bad news. There are 450 earnings announcements in our full sample, where we classify 182 as "good news" and 250 as "bad news". The sample is relatively balanced regarding the news content, given that the sample period (2009-2015) coincides with the global financial crisis. Figure 1 provides the descriptive statistics on the size of our event sample across different years.

Insert Figure 1

2.3 Daily trade imbalance

For each of the banks that were publicly traded in BIST between 2009 and 2015, we download the intraday order and trade book from BIST Datastore. Each observation in our order dataset includes the date, time, ticker, order ID, order type, quantity, and price entries at a second frequency. We only use orders submitted in continuous auction periods to avoid heterogeneous information arrival during opening and closing auctions. Unlike the intraday order data that can be obtained for other developed or emerging markets stocks, BIST order-book data includes broker ID, which enables us to distinguish brokerage houses that transmit orders to BIST. Using this information, we are able to explore potential heterogeneities in order flow across different brokerage houses before earnings announcements.

BIST has not shared the broker ID on publicly available limit order book data after introducing the BISTECH trading system in November 2015. BISTECH enabled differences in order submission and trade execution latency among investors in BIST. Therefore, in our sample period, there are no differences among investors regarding latency, which further helps us to isolate the impact of business group affiliation on information leakage.

Observations in our trade data consist of the date, time, ticker, trade quantity, price, and order IDs on both the buy and the sell side of the trade. We then use the intraday order and trade data to stack the daily buy and sell trade volumes on the stock of each bank in our sample around earnings announcements. Specifically, the total and net trade volume of each brokerage house is calculated starting 40 days before the announcement up until and including the announcement

date [-40,0] (event window).

We define $B_{b,i,d}$ and $S_{b,i,d}$ as the buy and sell trade for broker b, on a given trading day d around an earnings announcement event i. Specifically, we sum the Turkish Lira (TL) denominated volume of trades when broker b is on the buy (sell) side across each trading day d in the event window of i, to calculate $B_{b,i,d}$ ($S_{b,i,d}$). Each event i is associated with a single bank's stock; therefore, the trade flow of a given broker is also on a single stock s. However, we prefer to use the notations with events rather than stocks since a bank in our sample has multiple earnings release events. Nonetheless, in our econometric models, we use s to denote bank-level variables and fixed effects.

The total daily trade flow passing through a broker b on a given trading day d around an earnings announcement event i is then given by the logarithmic transformation of the sum of buy and sell trade volume as follows:

$$TOTFLOW_{b,i,d} = \log(B_{b,i,d} + S_{b,i,d}) \tag{1}$$

We examine the imbalances in the buy and sell trades to proxy for the private information content of a trade flow across each broker (Easley et al., 1996; Chordia and Subrahmanyam, 2004; Easley et al., 2008; Park et al., 2014). In particular, we define $NETFLOW_{b,i,d}$ that enables us to model the trade direction around the earnings announcements in the following manner (Bittner et al., 2023):

$$NETFLOW_{b,i,d} = \begin{cases} \log(B_{b,i,d} - S_{b,i,d}), & \text{if} \quad (B_{b,i,d} - S_{b,i,d}) > 0 \\ -\log(B_{b,i,d} - S_{b,i,d}), & \text{if} \quad (B_{b,i,d} - S_{b,i,d}) < 0 \end{cases} \tag{2}$$

We conjecture that $NETFLOW$ will be higher (in magnitude) when the private information content of the trade flow passing through a brokerage house increases. Next, we split our event window into two equal parts. We label [-20,0] as the pre-announcement window. In line with this definition, we set $PREANN_{i,d}$ as a dummy variable that takes one if day d is in the pre-announcement window for event i, and zero otherwise.

We then delineate a business group affiliation measure to examine the heterogeneity across

brokerage houses concerning the net trade flow. We precisely capture the business group affiliation with brokers and banks using $AFFILIATED_{b,i}$ dummy, which takes the value one if the brokerage house b is in the same business group with the bank in event i, and zero otherwise. Table 1 provides details on the bank-broker affiliation relationship. For instance, regarding the earnings releases of AKBNK, $AFFILIATED$ is set to be one only for AKM and CIM.

Finally, to construct sub-sample analyses across the news content of each earnings announcement, we define $NTYPE_i$, which is a dummy variable that takes one (zero) if the earnings announcement signals "good news" ("bad news") to the equity investors of the corresponding bank. Table 2 presents the descriptive statistics and pairwise correlations of each variable described in this section. Table 2 shows that the average NETFLOW passing through a broker on each trading day is around 0, as expected. There are 119 different brokers trading the stocks of banks in our sample. Only 1% of the brokers in our sample are classified as affiliated. 42% of the earnings announcements are labeled as good news.

Insert Table 2 here

As anecdotal evidence, Figure 2 provides the TL-denominated cumulative changes in the net flow passing through affiliated (AKM and CIM) and unaffiliated brokers around the good and bad earnings releases of AKBNK. We first sum up the net flow of affiliated and unaffiliated brokers across each earnings announcement event. We then accumulate these sums across each trading day in [-20,20]. To the extent that net trading flows proxy for informed trading, we expect net trade flows passing through affiliated brokerage houses to be on the buy (sell) side around the bank's earnings releases, signaling good (bad) news for the underlying stock. We observe this pattern in Figure 2. Net flows passing through AKM and CIM are on the buy (sell) side when the earnings announcement brings good (bad) news for the AKBNK stock. The cumulative net trade flow of affiliated brokerage houses reaches up to 30 million TL (around 15 million U.S. Dollars) in the pre-announcement window of good earnings releases. Similarly, affiliated brokerage houses' cumulative net trade flow is around -20 million TL in the pre-announcement window of bad earnings releases.

Insert Figure 2 here

As such, clients of brokerage houses that are in the same business group with the underlying bank initiate to take net (buy) sell positions on the bank's stock much earlier than the official earnings announcement date, which can indicate potential information leakage through affiliated brokerage houses around earnings announcements. Consequently, Figure 2 motivates to explore business group affiliation as a potential economic mechanism for the information leakage problem, particularly evident in the BIST (Hekimoğlu and Tanyeri, 2011; Simsir and Simsek, 2022).

3 Methodology and Results

3.1 Price reactions to earnings announcements

We initiate our analyses by examining the average stock price response around earnings announcements for all banks publicly traded in Borsa Istanbul (BIST). We employ the event study methodology proposed by Brown and Warner (1985) to assess the stock market response to earnings announcements. Specifically, between [-40,-21], we compute the standard errors associated with cumulative abnormal returns calculated in the pre-announcement window[-20,0], where 0 corresponds to the announcement date. Let $R_{i,d}$ be the percentage return for the underlying bank stock associated with event i on trading day d. The abnormal return is calculated as the difference between the individual stock return and the market index (BIST100) as follows:

$$AR_{i,d} = R_{i,d} - R_{m,d} \quad \textit{(Market Adjusted Abnormal Return)} \tag{3}$$

We calculate cumulative average abnormal returns separately around earnings announcements where the announcement carries good or bad news. If earnings release carries new information to the market about the underlying bank, we expect to observe significant and positive (negative) abnormal returns around good (bad) news.

In line with our expectations, Figure 3 documents significant positive (negative) cumulative average abnormal returns for events that convey good (bad) news in the [-20,20] window. The 41-day cumulative average abnormal return (CAR(-20,20)) for good earnings releases is around

1.5%, significant at a 1% level. CAR(-20,20) for bad earnings announcements is approximately -1%, which again is statistically significant at a 1% level. However, we observe considerable price reaction in the pre-announcement window only for earnings announcements that carry good news. The CAR(-20,0) for good earnings announcements is around 1.5%, indicating that almost all information regarding the earnings release is embedded in the prices *before* the official announcement, suggesting significant information leakages around good earnings releases. We do not observe similar findings for earnings announcements that convey bad news for the underlying bank. CAR(-20,0) for bad earnings releases is statistically indistinguishable from zero, suggesting a significant post-announcement drift. Figure 3 also shows some post-announcement drift for good earnings releases. The cumulative abnormal returns reach above 2% in the five days preceding the official announcement. However, the significance of cumulative abnormal returns and the persistence of post-announcement drift is more evident for events that carry bad news. These findings would suggest that information leakage problems around earnings announcements may be more substantial for good earnings releases. This argument aligns with the findings of Simsir and Simsek (2022), who also document that information leakage problems in BIST are more evident when the information event brings good news for the underlying stock.

Insert Figure 3 here

Independent of whether they carry good or bad news, the price reaction to earnings announcements is significantly more limited than responses observed in developed markets (see, for example, Vega (2006)). The smaller magnitude of price reaction may be attributable to information leakage problems, particularly evident in BIST (Hekimoğlu and Tanyeri, 2011). In the next section, we examine whether there is systematic information leakage around earnings announcements of banks that are publicly traded in BIST. Furthermore, if such leakage is identified, we will explore the prospect of business group affiliation as a plausible economic mechanism.

3.2 Business group affiliated brokers and trade flow

Next, we examine the affiliated and unaffiliated brokers with respect to total and net trade flow around earnings announcements. If affiliated brokers have an informational edge over unaffiliated brokers, we would expect significant changes in the net trade volume passing through affiliated brokerage houses and that these changes align with the overall price reaction. Using the following specifications, we investigate whether total and net trade flow substantially differ across group affiliated and unaffiliated brokerage houses during the pre-announcement window:

$$TOTFLOW_{b,i,d} = \beta_0 PREANN_{i,d} + \beta_1 AFFILIATED_{b,i} + \beta_2 PREANN_{i,d} * AFFILAITED_{b,i} + \theta_s + \mu_b + \gamma_d + \varepsilon_{b,i,d}. \quad (4)$$

$$NETFLOW_{b,i,d} = \beta_0 PREANN_{i,d} + \beta_1 AFFILIATED_{b,i} + \beta_2 PREANN_{i,d} * AFFILAITED_{b,i} + \theta_s + \mu_b + \gamma_d + \varepsilon_{b,i,d}. \quad (5)$$

In equations (4) and (5), $TOTFLOW_{b,i,d}$ represents the logarithmic transformation of the total (buyer- plus seller-initiated) daily trade flow passing through broker b on a given trading day d around an earnings announcement event i whereas $NETFLOW_{b,i,d}$ is the logarithmic transformation of the net (buyer- minus seller-initiated) daily trade flow passing through broker b on a given trading day d around an earnings announcement event i. $PREANN_{i,d}$ is a dummy variable that takes one if day d is in the pre-announcement period for event i, and zero otherwise. $AFFILIATED_{b,i}$ is another dummy that takes the value one if the brokerage house b is in the same business group as the underlying bank in event i, and zero otherwise. Finally, $\theta_s, \mu_b, \gamma_d$ respectively represent bank-, broker- and date-fixed effects to capture unobserved heterogeneity across firms, brokerage houses, and time.

In both specifications, the coefficient of interest, β_2, provides the average changes in (total or

net) trade flow before the earnings announcements of publicly traded Turkish banks. That is, equations (4) and (5) enable us to examine whether (total or net) trade flow from business group-affiliated brokerage houses significantly changes during the pre-announcement period. Tables 3 and 4 present the results for equations (4) and (5), respectively. The relationship between a bank and a brokerage house is measured by whether the brokerage house is in the same business group as the bank. The results in Table 3 suggest that the total trade flow passing through affiliated brokerage houses, on average, decreases by 6% in the pre-announcement period of an earnings release; however, this decrease is *not* statistically significant after controlling for potential unobserved heterogeneity across brokers, banks, and time.

Insert Table 3 here

The results presented in Table 4, on the other hand, document a statistically significant increase in the net trade flow passing through affiliated brokerage houses in the pre-announcement window. In particular, the net trade flow passing through the affiliated brokerage houses in the pre-announcement window, on average, increases by 15%. To the extent that trade imbalances proxy for the arrival of traders with private information, the informed trading activity seems more evident in the earnings releases, which carry good news for the underlying bank stock. Specifically, for the events that bring positive EPS levels higher than the industry median, the net trade flow through affiliated brokers in the pre-announcement window increases by almost 40%. The increase is statistically significant at a 1% level. In line with our expectations, column (3) of Table 4 further shows that the net trade flow passing through affiliated brokerage houses, on average, decreases by 8% around earnings announcements that carry bad news. However, this decrease is *not* statistically significant after controlling for unobserved heterogeneity across brokers, banks, and time. The limited information leakage around the events with bad news may further help us explain our earlier results, indicating no price reaction for these events in the pre-announcement window.

Insert Table 4 here

Overall, our results suggest that: 1) The price reaction is asymmetric. Information about the banks' financials seems to be incorporated into the prices much earlier than the day of the earnings announcements, especially for releases that carry good news for the underlying bank. 2) The abnormal returns on announcement days are smaller in magnitude for Turkish banks compared to stocks traded in developed markets, indicating information leakages prior to announcements. 3) The persistence of post-announcement drift is more evident for events that carry bad news. 4) For earnings releases that carry good news, the increase in the net-buy (informed) trades is significantly more evident for the affiliated brokerage houses, even after controlling for unobserved heterogeneity across brokers, banks, and time. Even though the net-buy trades, on average, decrease around announcements with bad news, this decrease is not statistically significant. 5) The trading behavior of the customers of brokerage houses that are in the same business group with the underlying bank before the official earnings releases aligns with the overall market response.

In sum, these findings provide evidence for the informational edge of brokerage houses that are in the same business groups with underlying banks over unaffiliated brokerage houses when trading the underlying bank stocks, especially around earnings releases that carry positive news. These findings may also help us understand why information leakage in BIST is more evident for events that bring good news, as presented by Simsir and Simsek (2022). The asymmetry in the informational content of affiliated brokerage houses is reminiscent of the results presented by Tiniç et al. (2022), which document a significant additional price impact associated with proprietary buy trades of brokers in BIST but not proprietary sell trades. Prior literature also demonstrates asymmetric price impacts of institutional investors, and studies argue such asymmetric price effects may arise because stock sale decisions are primarily motivated by liquidity-related reasons rather than information-based decisions (Chan and Lakonishok, 1993; Keim and Madhavan, 1995; Griffiths et al., 2000; Saar, 2001).

3.3 Additional channels of information dissemination

In this section, we explore two additional types of brokers that can disseminate private information around the earnings announcements of publicly traded Turkish banks.

First, we explore whether foreign brokerage houses have an informational edge over domestic brokers in trading the underlying bank stock around earnings releases. During our sample period, foreign investors dominate the Turkish stock market, holding almost 65% of the publicly traded shares in BIST. In this period, foreign holdings are mostly concentrated in the financial sector, therefore, this ratio is even higher for publicly traded banks. On the one hand, customers of foreign brokerage houses that operate in BIST may be large foreign institutional investors with significant investment expertise and experience in international equity markets, which may give an informational advantage over customers of domestic investors (Froot and Ramadorai, 2008), independent of the business group affiliations. On the other hand, foreign investors face linguistic and cultural barriers and, therefore, may be disadvantaged compared to customers of local brokerage houses due to differences in accounting standards and country-specific legal environment (Choe et al., 2001).

We set $FOREIGN_{b,i}$ as a dummy variable that takes one if broker b is not domiciled in Turkey (Tiniç and Savaser, 2020). 11% of the observations in our sample are attributable to foreign brokerage houses that do not have retail banking operations in Turkey. We then replace $AFFILIATED$ with $FOREIGN$ in equations (4) and (5) and obtain the estimates for the coefficient of interest, β_2. The results are presented in Table 5. Specifically, the results presented in Table 5 - Panel A demonstrate the coefficient estimates obtained from the updated version of equation (4), whereas Table 5 - Panel B documents the results for the updated version of equation (5).

Insert Table 5 here

In Table 5 - Panel A, we observe that total trade flow passing through foreign brokerage houses, on average, decreases by 5% around the pre-announcement period of the earnings releases

of publicly traded Turkish banks. The subsample analyses reveal that the average decrease in total flow in the full sample is due to earnings announcements that carry bad news. Our results further suggest that total flow passing through the foreign brokerage houses increases around earnings releases with positive information about the underlying bank.

The results presented in Table 5 - Panel B, on the other hand, show that net flow submitted through foreign brokerage houses, on average, decreases (increases) before good (bad) earnings releases, albeit the changes are not statistically significant. In sum, our results suggest that foreign brokerage houses do not actively contribute to the information leakage problem in BIST. These results indicate that foreign investors in BIST are primarily liquidity traders around earnings announcements of publicly traded banks, which would further support the theoretical expectations of Choe et al. (2001).

Next, we explore whether brokerage houses that are affiliated with state banks have an information advantage over the others in trading stocks of Turkish banks around earnings releases. Three of the banks in our sample are state banks owned by the Turkish government. In our analyses, we set each state bank to be affiliated with brokerage houses of three major government banks (T. Halk Bankasi A.S., Turkiye Vakiflar Bankasi A.S., and Turkiye Ziraat Bankasi A.S.). For example, Turkiye Vakiflar Bankasi A.S. (VKBNK) has Vakif Yatirim Menkul Degerler A.S. (VKY), which operates as its brokerage subsidiary in BIST. However, we set VKBNK to be affiliated with VKY, along with Halk Yatirim Menkul Degerler A.S. (HLY) and Ziraat Yatirim Menkul Degerler A.S. (ZRY).

State-affiliated brokerage houses may have an informational edge over others due to their superior access to private information through political and institutional connections (Fisman, 2001; Acemoglu et al., 2016), independent of the business group narrative. We examine this by creating a dummy variable, $STATE_{b,i}$ that takes value one if broker b is in $\{VKY, ZRY, HLY\}$ and zero otherwise. The sample average for $STATE$ is around 4%. Similarly, we update our daily panel regression models presented in equations (4) and (5) by replacing $AFFILIATED$ with $STATE$ and obtain estimates for our coefficient of interest, β_2. The results are presented in Table

6. Specifically, the results presented in Table 6 - Panel A demonstrate the coefficient estimates obtained from the updated version of equation (4), whereas Table 6 - Panel B documents the results for the updated version of equation (5).

Insert Table 6 here

The results presented in Table 6 indicate no significant changes in both the total and the net trade flow submitted through the state-affiliated brokers. This would imply that state-affiliated brokers *do not* actively disseminate private information about the earnings releases of Turkish banks ahead of official announcements.

Overall, our findings suggest that the private information about earnings announcements is (at least in part) disseminated by the business group affiliated brokerage houses, particularly when the earnings release carries positive news about the underlying bank. To the best of our knowledge, this paper is first to propose business group affiliation as an information dissemination mechanism in secondary markets. Consequently, we argue that business group affiliations may lead to the disclosure of private information by group-affiliated brokerage houses before corporate events, even in order-driven markets where brokers are assumed to be passive agents, simply transmitting clients' orders to the exchange.

4 Conclusion

In this paper, our objective is to explore a potential economic mechanism through which information leaks around corporate events, particularly focusing on earnings announcements. More specifically, we suggest that business group affiliations can serve as a mechanism for the revelation of private information before quarterly earnings releases. Our findings highlight a substantial increase in net buy positions held by customers of brokerage houses operating under the same business group as the underlying bank, particularly before announcements with favorable earnings prospects. We emphasize the active involvement of business group-affiliated brokers in influencing

the dissemination of information, challenging the traditional view of brokers merely transmitting orders in order-driven markets.

Our results contribute to the understanding of how information flows in financial markets. We illustrate that business group affiliations have significant implications for the process of disseminating private information and underscore the important role of broker affiliations even in order-driven markets.

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Table 1: **Banks and business group affiliated brokers** - Our sample consists of all commercial and investment banks publicly traded in Borsa Istanbul (BIST) between January 2009 and November 2015. This table presents the publicly traded banks in our sample and their brokerage house subsidiaries operating in BIST. The first two columns respectively present the bank name and the corresponding ticker. The last two columns represent the name and the ticker of the group-affiliated brokerage house.

Bank Name	**Bank Ticker**	**Broker Name**	**Broker Ticker**
AKBANK A.Ş.	AKBNK	AK YATIRIM MENKUL DEĞERLER A.Ş., CITI MENKUL DEĞERLER A.Ş.	AKM,CIM
ALBARAKA TÜRK KATILIM BANKASI A.Ş.	ALBRK	OYAK YATIRIM MENKUL DEĞERLER A.Ş.	OYA
ALTERNATİFBANK A.Ş.	ALNTF	ALTERNATİF YATIRIM MENKUL DEĞERLER A.Ş.	AMK
ASYA KATILIM BANKASI A.Ş.	ASYAB	ASYA YATIRIM MENKUL DEĞERLER A.Ş.	AMD
DENİZBANK A.Ş.	DENIZ	DENİZ YATIRIM MENKUL KIYMETLER A.Ş.	DZY
FİNANSBANK A.Ş.	FINBN	FİNANS YATIRIM MENKUL DEĞERLER A.Ş.	FNY
FORTIS BANK A.Ş.	FORTS	FORTİS YATIRIM MENKUL DEĞERLER A.Ş.	FRS
GARANTİ BANKASI A.Ş.	GARAN	GARANTİ YATIRIM MENKUL KIYMETLER A.Ş.	GRM

Bank Name	Bank Ticker	Broker Name	Broker Ticker
T. HALK BANKASI A.Ş.	HALKB	HALK YATIRIM MENKUL DEĞERLER A.Ş., VAKIF YATIRIM MENKUL DEĞERLER A.Ş., ZİRAAT YATIRIM MENKUL DEĞERLER A.Ş.	HLY,VKY,ZRY
TÜRKİYE İŞ BANKASI A.Ş.	ISCTR	İŞ YATIRIM MENKUL DEĞERLER A.Ş.	IYM
TÜRKİYE KALKINMA VE YATIRIM BANKASI A.Ş.	KLNMA	KALKINMA YATIRIM MENKUL DEĞERLER A.Ş., HALK YATIRIM MENKUL DEĞERLER A.Ş., VAKIF YATIRIM MENKUL DEĞERLER A.Ş., ZİRAAT YATIRIM MENKUL DEĞERLER A.Ş	KMD, HLY,VKY,ZRY
ŞEKERBANK T.A.Ş.	SKBNK	ŞEKER YATIRIM MENKUL DEĞERLER A.Ş.	SKY
TÜRK EKONOMİ BANKASI A.Ş.	TEBNK	TEB YATIRIM MENKUL DEĞERLER A.Ş.	TBY

Bank Name	Bank Ticker	Broker Name	Broker Ticker
TEKSTİL BANKASI A.Ş	TEKST	TEKSTİL MENKUL DEĞERLER A.Ş.	TLM
TÜRKİYE KALKINMA VE YATIRIM BANKASI A.Ş.	TKBNK	KALKINMA YATIRIM MENKUL DEĞERLER A.Ş., HALK YATIRIM MENKUL DEĞERLER A.Ş., VAKIF YATIRIM MENKUL DEĞERLER A.Ş., ZİRAAT YATIRIM MENKUL DEĞERLER A.Ş	KMD, HLY,VKY,ZRY
TÜRKİYE SINAİ KALKINMA BANKASI A.Ş.	TSKB	TSKB MENKUL DEĞERLER A.Ş.	TSM,IYM
TÜRKİYE VAKIFLAR BANKASI T.A.O.	VAKBN	VAKIF YATIRIM MENKUL DEĞERLER A.Ş. HALK YATIRIM MENKUL DEĞERLER A.Ş., ZİRAAT YATIRIM MENKUL DEĞERLER A.Ş	VKY, HLY,ZRY
YAPI VE KREDİ BANKASI A.Ş.	YKBNK	YAPI KREDİ YATIRIM MENKUL DEĞERLER A.Ş., UNI-CREDIT MENKUL DEĞERLER A.Ş., KOÇ YATIRIM MENKUL DEĞERLER A.Ş.	YKR,UCI,KCM

Table 2: **Descriptive statistics and pairwise correlations -** This table provides descriptive statistics and pairwise correlations of each variable used in our analyses. $TOTFLOW$ is the logarithmic transformation of the sum of buyer- and seller-initiated trade flows at the broker-date level. $NETFLOW$ is the logarithmic transformation of the absolute difference in buy and sell flows at the broker-date level. $PREANN$ is a dummy variable that takes one for the period covering 20 days before an earnings announcement event [-20,0] and zero otherwise. $AFFILIATED$ is a dummy variable that takes one if a broker is in the same business group as the bank. $NTYPE$ is a dummy that takes one if the earnings announcement is labeled as "Good news" and zero if the announcement is labeled as "Bad news" for the underlying bank. An earnings announcement event is labeled as "bad news" if the EPS for a given bank in a given quarter is negative. If EPS is positive, an announcement is labeled as "Good news" ("Bad news") if the EPS for a given bank in a given quarter is greater (less) than the industry median. *** denotes statistical significance at a 1% level.

Panel A: Descriptive Statistics

Variable	$TOTFLOW$	$NETFLOW$	$PREANN$	$AFFILIATED$	$NTYPE$
Observations	2,269,811	2,269,811	2,269,811	2,269,811	2,176,186
Mean	6.37	-0.084	0.344	0.017	0.424
Std. dev.	6.464	7.697	0.475	0.13	0.494
Min	-0.968	-19.628	0	0	0
Max	19.87	18.936	1	1	1

Panel B: Pairwise Correlations

$TOTFLOW$	1				
$NETFLOW$	-0.00902***	1			
$PREANN$	0.00864***	0.00379***	1		
$AFFILIATED$	0.106***	0.00241***	0.000519	1	
$NTYPE$	0.0160***	-0.00318***	0.00000565	0.00378***	1

Table 3: **Broker-level regressions for total trade flow** - This table provides the results for the following model: $TOTFLOW_{b,i,d} = \beta_0 PREANN_{i,d} + \beta_1 AFFILIATED_{b,i} + \beta_2 PREANN_{i,d} * AFFILIATED_{b,i} + \theta_s + \mu_b + \gamma_d + \varepsilon_{b,i,d}$ where $TOTFLOW_{b,i,d}$ represents the total (buyer- plus seller-initiated) daily trade flow passing through broker b on a given trading day d around an earnings announcement event i. $PREANN_{i,d}$ is a dummy variable that takes one if day d is in the pre-announcement period for event i, and zero otherwise. $AFFILIATED_{b,i}$ is another dummy that takes the value one if the brokerage house b is in the same business group with the underlying bank in event i, and zero otherwise. Finally, $\theta_s, \mu_b, \gamma_d$ respectively represents bank-, broker- and date-fixed effects to capture unobserved heterogeneity across firms, brokerage houses, and time. The values in parenthesis are t-statistics of the corresponding coefficients. $NTYPE$ is a dummy that takes one if the earnings announcement is labeled as "Good news" and zero if the announcement is labeled as "Bad news" for the underlying bank. An earnings announcement event is labeled as "Bad news" if the EPS for a given bank in a given quarter is negative. If EPS is positive, an announcement is labeled as "Good news" ("Bad news") if the EPS for a given bank in a given quarter is greater (less) than the industry median. *** and ** respectively denote statistical significance at 1% , and 5% levels.

	(1)	(2)	(3)
VARIABLES	$TOTFLOW$	$TOTFLOW$	$TOTFLOW$
$PREANN$	-0.00721	-0.0197	-0.00238
	(-0.713)	(-1.194)	(-0.167)
$AFFILIATED$	0.547***	0.478***	0.613***
	(19.97)	(11.23)	(16.66)
$PREANN * AFFILIATED$	-0.0592	-0.101	-0.0216
	(-1.319)	(-1.454)	(-0.357)
Constant	6.364***	6.500***	6.282***
	(1,426)	(906.1)	(1,021)
News Type	Full Sample	$NTYPE = 1$	$NTYPE = 0$
Observations	2,269,811	923,390	1,252,796
Adjusted R-squared	58.20%	58.90%	58.80%
Broker Stock and Date FE	YES	YES	YES

Table 4: **Broker-level regressions for informed trade flow -** This table provides the results for the following model: $NETFLOW_{b,i,d} = \beta_0 PREANN_{i,d} + \beta_1 AFFILIATED_{b,i} + \beta_2 PREANN_{i,d} * AFFILIATED_{b,i} + \theta_s + \mu_b + \gamma_d + \varepsilon_{b,i,d}$ where $NETFLOW_{b,i,d}$ is the net (buyer- minus seller-initiated) daily trade flow passing through broker b on a given trading day d around an earnings announcement event i. $PREANN_{i,d}$ is a dummy variable that takes one if day d is in the pre-announcement period for event i, and zero otherwise. $AFFILIATED_{b,i}$ is another dummy that takes the value one if the brokerage house b is in the same business group with the underlying bank in event i, and zero otherwise. Finally, $\theta_s, \mu_b, \gamma_d$ respectively represents bank-, broker- and date-fixed effects to capture unobserved heterogeneity across firms, brokerage houses, and time. The values in parenthesis are t-statistics of the corresponding coefficients. $NTYPE$ is a dummy that takes one if the earnings announcement is labeled as "Good news" and zero if the announcement is labeled as "Bad news" for the underlying bank. An earnings announcement event is labeled as "Bad news" if the EPS for a given bank in a given quarter is negative. If EPS is positive, an announcement is labeled as "Good news" ("Bad news") if the EPS for a given bank in a given quarter is greater (less) than the industry median. *** and ** respectively denote statistical significance at 1% and 5% levels.

	(1)	(2)	(3)
VARIABLES	$NETFLOW$	$NETFLOW$	$NETFLOW$
$PREANN$	-0.0158	-0.0251	-0.00969
	(-0.851)	(-0.820)	(-0.370)
$AFFILIATED$	-0.0133	-0.156**	0.139**
	(-0.264)	(-1.967)	-2.055
$PREANN * AFFILIATED$	0.149	0.388***	-0.0818
	-1.804	-3.009	(-0.735)
Constant	-0.0788***	-0.109***	-0.0672***
	(-9.621)	(-8.197)	(-5.929)
News Type	Full Sample	$NTYPE = 1$	$NTYPE = 0$
Observations	2,269,811	923,390	1,252,796
Adjusted R-squared	0.70%	0.90%	0.80%
Broker Stock and Date FE	YES	YES	YES

Table 5: **Broker-level regressions for foreign brokerage houses -** This table provides the results for the following models: $TOTFLOW_{b,i,d} = \beta_0 PREANN_{i,d} + \beta_1 FOREIGN_{b,i} + \beta_2 PREANN_{i,d} * FOREIGN_{b,i} + \theta_s + \mu_b + \gamma_d + \varepsilon_{b,i,d}$ and $NETFLOW_{b,i,d} = \beta_0 PREANN_{i,d} + \beta_1 FOREIGN_{b,i} + \beta_2 PREANN_{i,d} * FOREIGN_{b,i} + \theta_s + \mu_b + \gamma_d + \varepsilon_{b,i,d}$ where $TOTFLOW_{b,i,d}$ represents the total (buyer- plus seller-initiated) daily trade flow passing through broker b on a given trading day d around an earnings announcement event i. $NETFLOW_{b,i,d}$ is the net (buyer- minus seller-initiated) daily trade flow passing through broker b on a given trading day d around an earnings announcement event i. $PREANN_{i,d}$ is a dummy variable that takes one if day d is in the pre-announcement period for event i, and zero otherwise. $FOREIGN_{b,i}$ is another dummy that takes the value one if the brokerage house b is not domiciled in Turkey around event i, and zero otherwise. Finally, $\theta_s, \mu_b, \gamma_d$ respectively represents bank-, broker- and date-fixed effects to capture unobserved heterogeneity across firms, brokerage houses, and time. The values in parenthesis are t-statistics of the corresponding coefficients. $NTYPE$ is a dummy that takes one if the earnings announcement is labeled as "Good news" and zero if the announcement is labeled as "Bad news" for the underlying bank. An earnings announcement event is labeled as "Bad news" if the EPS for a given bank in a given quarter is negative. If EPS is positive, an announcement is labeled as "Good news" ("Bad news") if the EPS for a given bank in a given quarter is greater (less) than the industry median. *** and ** respectively denote statistical significance at 1% and 5% levels.

	(1)	(2)	(3)	(1)	(2)	(3)
VARIABLES	Panel A: $TOTFLOW$			$PanelB: NETFLOW$		
$PREANN$	-0.00247	-0.0287	0.0113	-0.0100	-0.0130	-0.0113
	(-0.240)	(-1.708)	(0.778)	(-0.530)	(-0.418)	(-0.424)
$PREANN * FOREIGN$	-0.0482***	0.0593**	-0.115***	-0.0270	-0.0419	0.00237
	(-2.668)	(2.092)	(-4.797)	(-0.812)	(-0.795)	(0.0538)
Constant	6.373***	6.509***	6.292***	-0.0790***	-0.112***	-0.0648***
	(1,436)	(912.3)	(1,027)	(-9.703)	(-8.454)	(-5.752)
News Type	Full Sample	NTYPE = 1	NTYPE = 0	Full Sample	NTYPE = 1	NTYPE = 0
Observations	2,269,811	923,390	1,252,796	2,269,811	923,390	1,252,796
Adjusted R-squared	58.2%	58.8%	58.8%	0.7%	0.9%	0.8%
Broker Stock and Date FE	YES	YES	YES	YES	YES	YES

Table 6: **Broker-level regressions for state brokerage houses -** This table provides the results for the following models: $TOTFLOW_{b,i,d} = \beta_0 PREANN_{i,d} + \beta_1 STATE_{b,i} + \beta_2 PREANN_{i,d} * STATE_{b,i} + \theta_s + \mu_b + \gamma_d + \varepsilon_{b,i,d}$ and $NETFLOW_{b,i,d} = \beta_0 PREANN_{i,d} + \beta_1 STATE_{b,i} + \beta_2 PREANN_{i,d} * STATE_{b,i} + \theta_s + \mu_b + \gamma_d + \varepsilon_{b,i,d}$ where $TOTFLOW_{b,i,d}$ represents the total (buyer- plus seller-initiated) daily trade flow passing through broker b on a given trading day d around an earnings announcement event i. $NETFLOW_{b,i,d}$ is the net (buyer- minus seller-initiated) daily trade flow passing through broker b on a given trading day d around an earnings announcement event i. $PREANN_{i,d}$ is a dummy variable that takes one if day d is in the pre-announcement period for event i, and zero otherwise. $STATE_{b,i}$ is another dummy that takes the value one if the brokerage house b is in $\{ZRY, VKY, HLY\}$. Finally, $\theta_s, \mu_b, \gamma_d$ respectively represents bank-, broker- and date-fixed effects to capture unobserved heterogeneity across firms, brokerage houses, and time. The values in parenthesis are t-statistics of the corresponding coefficients. $NTYPE$ is a dummy that takes one if the earnings announcement is labeled as "Good news" and zero if the announcement is labeled as "Bad news" for the underlying bank. An earnings announcement event is labeled as "Bad news" if the EPS for a given bank in a given quarter is negative. If EPS is positive, an announcement is labeled as "Good news" ("Bad news") if the EPS for a given bank in a given quarter is greater (less) than the industry median. *** and ** respectively denote statistical significance at 1% and 5% levels.

	(1)	(2)	(3)	(1)	(2)	(3)
VARIABLES	Panel A: $TOTFLOW$			Panel B: $NETFLOW$		
$PREANN$	-0.00930	-0.0199	-0.00540	-0.0139	-0.0243	-0.00637
	(-0.917)	(-1.207)	(-0.378)	(-0.745)	(-0.793)	(-0.242)
$PREANN * STATE$	0.0300	-0.0425	0.0738	0.0177	0.173	-0.129
	(0.956)	(-0.859)	(1.772)	(0.308)	(1.890)	(-1.686)
Constant	6.373***	6.508***	6.292***	-0.0790***	-0.112***	-0.0648***
	(1,436)	(912.3)	(1,027)	(-9.703)	(-8.453)	(-5.752)
News Type	Full Sample	$NTYPE = 1$	$NTYPE = 0$	Full Sample	$NTYPE = 1$	$NTYPE = 0$
Observations	2,269,811	923,390	1,252,796	2,269,811	923,390	1,252,796
Adjusted R-squared	58.2%	58.8%	58.8%	0.7%	0.9%	0.8%
Broker Stock and Date FE	YES	YES	YES	YES	YES	YES

Figure 1: **Events Descriptive** - This figure presents the number of earnings announcement events in our sample period across each year. The earnings announcement dates and earnings per share (EPS) levels are obtained from the Public Disclosure Platform and Borsa Istanbul website. An announcement is labeled "Bad news" if the EPS level is negative. If the EPS level is positive, we label an announcement as "Good news" ("Bad news") if the EPS of a given bank in a given quarter is greater (less) than the median. Green (Red) bars represent the number of good (bad) events in our sample. Blue bars represent the total number of events for a given year. The difference between total - bad -good news captures the number of missing/unavailable EPS data.

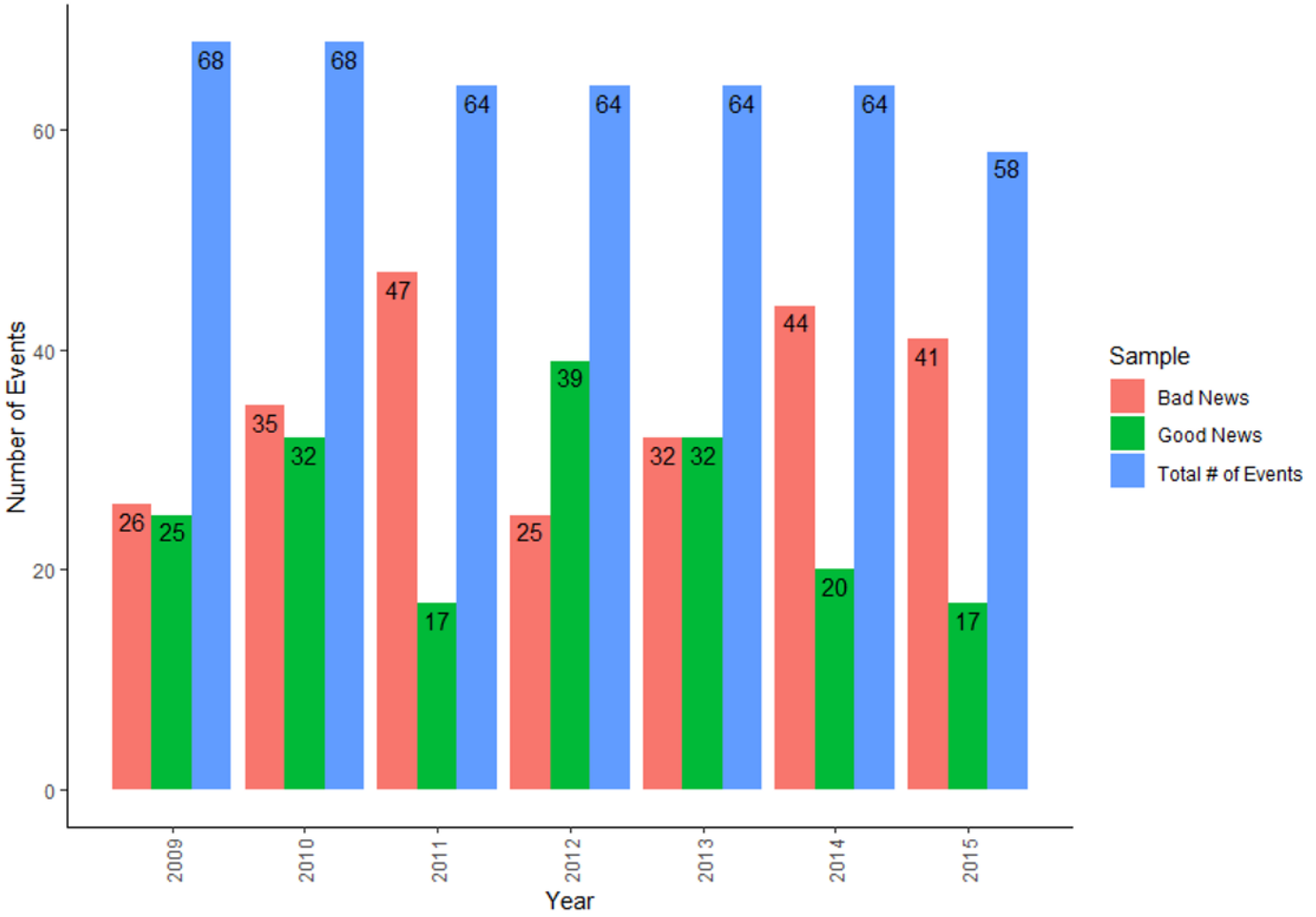

Figure 2: **Daily cumulative net trade volume around earnings announcements** - This figure provides the accumulated net flows transmitted to Borsa Istanbul for AKBNK stock by its affiliated brokerage houses (AKM, CIM) around earnings announcements across the period [-20,20]. We first sum the net flow of affiliated and unaffiliated brokers across each earnings announcement event. We then cumulative these sums across each trading day in [-20,20]. Net flows are the difference between buyer-initiated trade volume and seller-initiated trade volume. All values are denominated in the Turkish Lira (TL)

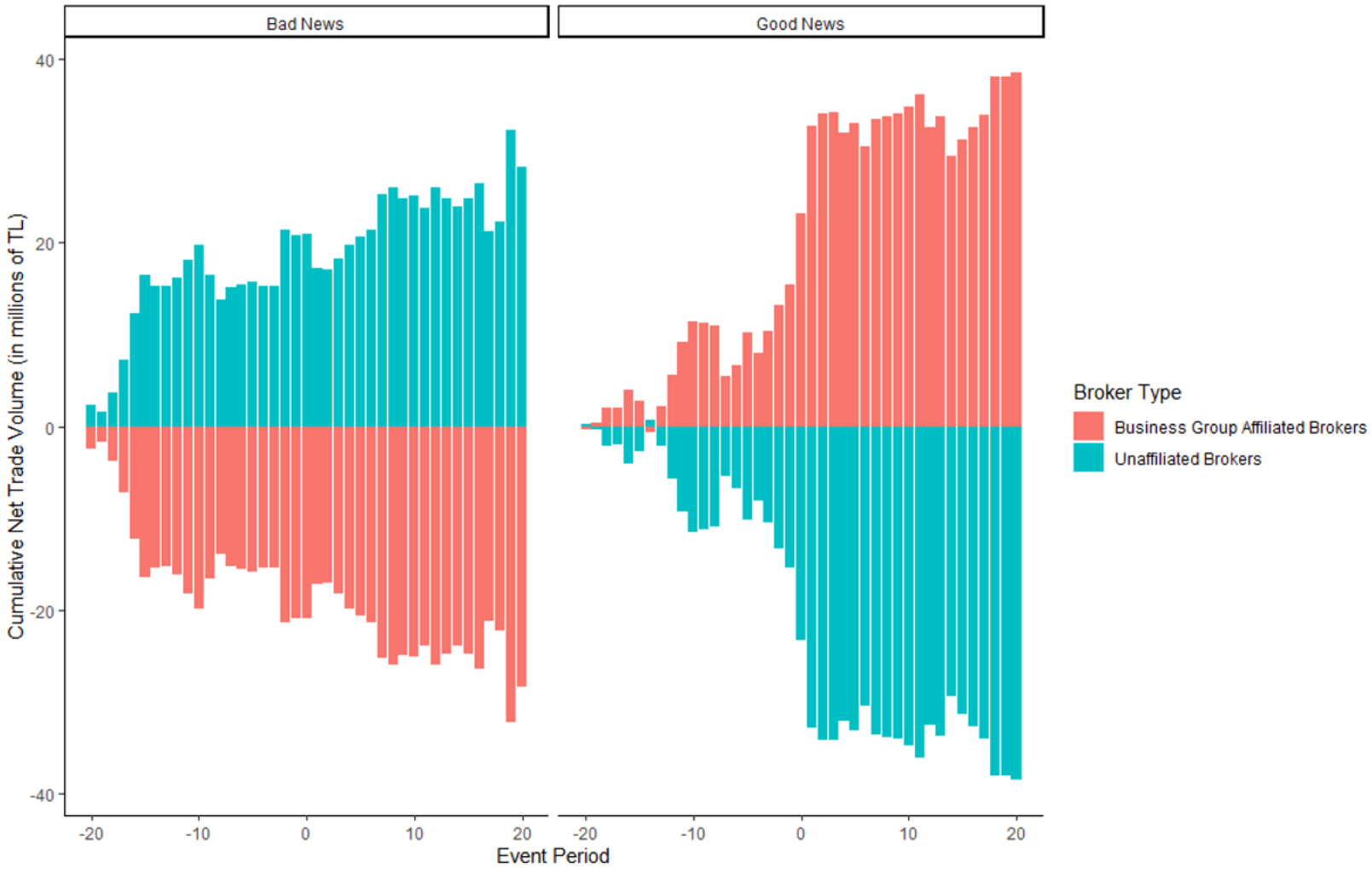

Figure 3: **Cumulative Average Abnormal Returns -** This figure provides the daily cumulative average abnormal returns (CARs) and associated standard errors during the window [-20,20]. We employ Brown and Warner (1985) event-study methodology to obtain CARs and corresponding standard errors. Abnormal returns are calculated using the market-adjusted model, where for a given trading day, an abnormal return on a given bank is the difference between the realized return on that bank's stock and the return of the market index (BIST100). An earnings announcement event is labeled as "Bad news" if the EPS for a given bank in a given quarter is negative. If EPS is positive, an announcement is labeled as "Good news" ("Bad news") if the EPS for a given bank in a given quarter is greater (less) than the industry median.