

STOCK-MARKET REACTIONS TO MERGERS OF NON-FINANCIAL  
TURKISH FIRMS

A Master's Thesis

by  
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September 2010



STOCK-MARKET REACTIONS TO MERGERS OF NON-FINANCIAL  
TURKISH FIRMS

The Institute of Economics and Social Sciences  
of  
Bilkent University

by

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In Partial Fulfilment of the Requirements for the Degree of  
MASTER OF SCIENCE

in

THE DEPARTMENT OF  
MANAGEMENT  
BİLKENT UNIVERSITY  
ANKARA

September 2010

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Science in Management.

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## ABSTRACT

### STOCK-MARKET REACTIONS TO MERGERS OF NON-FINANCIAL TURKISH FIRMS

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This study investigates stock-market reactions to mergers of non-financial Turkish firms. I conduct an event study to detect abnormal stock returns of Turkish target firms around merger announcements. In an efficient market, movements in stock prices (returns) reflect investors' assessments of new information about the firm and its operating environs. Assuming market efficiency, event studies model "normal" returns. Abnormal returns are the difference between realized returns and normal returns. The sample consists of 125 mergers from July 1991 to July 2009. This study reveals that Turkish targets earn on average a cumulative abnormal return of 8.56% in the three-day window around merger announcements when control rights in target firms change hands. This study contributes to the merger literature by providing evidence that markets react positively to merger announcements of Turkish target firms. However, reaction of Turkish markets generates smaller returns than the reaction of US and European markets. Stock market's reaction to merger announcements may differ from country to country as well as announcement date specification is problematic for Turkish firms which may be the reason for smaller returns in Turkish markets.

Keywords: Turkey, Mergers, Acquisitions, Event Study

## ÖZET

### FİNANSAL OLMAYAN TÜRK ŞİRKETLERİN BİRLEŞMELERİNE HİSSE SENEDİ PİYASASININ TEPKİLERİ

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Bu tezde finansal olmayan Türk şirketlerin birleşme duyurularına hisse senedi piyasasının gösterdiği tepkiler incelenmiştir. Birleşme duyurusu etrafında hedef şirketin anormal hisse senedi getirilerini ölçmek için olay çalışması yöntemi kullanılmıştır. Etkin bir piyasada, hisse fiyatındaki değişimler yatırımcıların şirket hakkındaki yeni haberleri değerlendirmesini yansıtır. Olay çalışmaları, piyasa etkinliği varsayımı altında, normal hisse senedi getirilerini modeller. Anormal getiriler, gerçekleşen getiriler ile normal getirilerin farkı olarak tanımlanmıştır. Bu çalışmanın örnek grubu Temmuz 1991 ile Temmuz 2009 arasında duyurulan 125 birleşmeden oluşmaktadır. Yönetim haklarının el değiştirdiği birleşmelerde Türk hedef şirketlerinin birleşme duyurusunun etrafındaki üç günlük olay penceresinde ortalama olarak %8.56 kümülatif anormal getiri elde ettiği bulunmuştur. Bu tez, Türk hedef şirketlerinin birleşme duyurularına piyasaların olumlu tepki verdiğini gösteren kanıtlar sunarak birleşme literatürüne katkıda bulunmuştur. Bununla birlikte, Türk piyasalarının tepkisi, ABD ve Avrupa piyasalarının tepkilerinde kıyasla daha düşük getiriler yaratmıştır. Hisse senedi piyasalarının tepkisi ülkeden ülkeye değişebileceği gibi Türk şirketlerin duyuru yaptığı tarihlerin belirlenmesindeki problemler Türk piyasasındaki düşük getirilerin bir nedeni olabilir.

Anahtar Kelimeler: Türkiye, Birleşmeler, Devralmalar, Olay Çalışması

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# CHAPTER I

## INTRODUCTION

This study investigates the stock-market reactions to mergers & acquisitions (M&As) of non-financial Turkish target firms between 1986 and 2009. Mergers cause extensive reallocation of resources in the economy and are one of the most important investment decisions that a firm can make. The aggregated deal value of mergers in US between 1980 and 2005 is about \$921 billion (in 2005 \$) (Bargeron et al., 2008). The aggregated deal value of this study's sample deals is 62 billion Turkish Liras (in 2009 TL) between 1991 and 2009. This study reveals that Turkish merger targets (targets are the firms being purchased) earn on average a risk-adjusted return of 8.56% in the three-day event window around merger announcements when control rights in target firms change hands.

This study employs event study method to measure the effect of mergers on target shareholder value. In an efficient market, movements in stock prices (returns) reflect investors' assessments of new information about the firm and its operating environs (Fama, 1991). Assuming market efficiency, event studies model "normal" returns. Abnormal returns (AR) are the difference between realized returns and normal (expected) returns. Cumulative abnormal return (CAR) is the summation of ARs over

the three-day event window around merger announcements. To investigate whether and if mergers affect target shareholder value, I test significance ARs and CARs in the days surrounding merger announcements.

Previous event studies examining stock-market reactions in US and European markets provide evidence that mergers create value for target firm shareholders. US and European target firms earn average CARs of 16% (Andrade et al., 2001) and 12.47% (Martynova and Renneboog, 2009), respectively, in the three-day event window around merger announcements. This study contributes to the literature by providing empirical evidence from Turkish mergers. Turkish targets earn an average CAR of 8.56% in the three-day event window.

The sample consists of 125 mergers from July 1991 to July 2009. Acquirer firms purchase target firms' control rights in 52 mergers. I refer to these mergers as control-changing mergers. 83 out of 125 mergers are completed. A completed merger is a merger in which the counterparties sign the merger contract and successfully conclude merger negotiations. Otherwise, the merger is incomplete<sup>1</sup>. All target firms are Turkish, publicly traded, and non-financial firms. I collect data on mergers using Securities Data Company (SDC), Factiva, MarketLine, and *IMKB Birleşme, Devralma, Bölünme Duyuruları* (henceforth Istanbul Stock Exchange M&A Announcements). I use Datastream to collect data on stock and market returns.

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<sup>1</sup> Securities Data Company (SDC) denotes the final status of mergers as effective, withdrawn, pending, or unknown. I classify a merger as completed if its final status in SDC is effective. Otherwise, I classify the merger as incomplete.

This study reveals that Turkish target firms earn significantly positive premiums in the three-day event window around merger announcements. For the entire sample, I examine significantly positive ARs on the days before and after announcement (day -1 and day 1, respectively) in addition to the announcement day (day 0). Average CAR in the three-day event window is 4.88% which is significant at 1%.

For Turkish targets, control-changing mergers lead to higher premiums than non-control-changing mergers. In a control-changing merger, acquirer firm purchases not only target firm shares but also its control rights. ARs for control-changing mergers are significant and positive on days -1, 0, and 1. However, for non-control-changing mergers, The only significant AR is on day 0. Average CAR in the three-day event window is 8.56% for control-changing mergers and 2.25% for non-control-changing mergers. Both CARs are significant at 1%.

I show that completed mergers result in higher premiums than incomplete mergers for Turkish targets. Average CAR in the three-day event window for completed mergers is 6.08% which is significant at 1%. The corresponding CAR for incomplete mergers is 2.5% but insignificant. Results indicate that stock markets anticipate which deals will be successful. The anticipation of success is reflected in the higher returns enjoyed by target shareholders. Value of target rights is embedded in the higher returns of completed mergers.

This study shows that cross-border mergers do not affect target three-day CARs. Prior literature finds mixed results relating to cross-border mergers. Bruner (2004) examines 17 studies comparing CARs to US targets in cross-border mergers to domestic mergers. These studies report either higher premium in cross-border mergers or no difference. In contrast to Bruner (2004), Martynova and Renneboog (2009) find that cross-border European mergers result in lower CAR.

Intra-industry mergers do not have a significant impact on target three-day CARs. Analyzing merger characteristics such as intra-industry mergers over a small sample is problematic. However, the insignificant result in this study can be explained by the small sample size. For example, using 760 deals, Martynova and Renneboog (2009) provide evidence that average CAR increases if the acquirer firm belongs to a different industry which is an inter-industry merger.

This study also finds out that transaction value of deals does not affect the three-day CARs in Turkish mergers. However, missing data restricts analyzing the impact of transaction value. For example, Martynova and Renneboog (2009) emphasize that mergers with large transaction values tend to lower CAR. In this study, transaction values of mergers are only available in 85 deals.



## **CHAPTER II**

### **LITERATURE REVIEW**

Previous studies focus on the motivation behind mergers (Gort, 1969; Mitchell and Mulherin, 1996; Andrade and Stafford, 2004), and how mergers affect shareholder value (Andrade et al., 2001; Martynova and Renneboog, 2006; Martynova and Renneboog, 2009).

#### **2.1 What Motivates Merger Activity?**

Mergers are tools for firms to restructure themselves against industry shocks (Gort, 1969; Jarrell et al., 1988; Mitchell and Mulherin, 1996). These studies show that merger activity is concentrated on industries that are exposed to shocks. Firms with better performance aim to acquire firms suffering from shocks in such industries (Andrade and Stafford, 2004).

Merger occurs due to the discrepancies between the acquirer firm's and target firm's valuations of the same asset under economic shocks (Gort, 1969). Merger becomes possible when non-owners of a firm place a higher value on the assets of that firm than its owners. Economic disturbances make past data less useful for determining a

firm's asset value. Thus, investors' valuations vary. This variance leads to merger events.

## **2.2 How Merger Activity Affects Shareholders?**

Previous studies focus on the value that mergers generate (destroy) for different groups of shareholders such as targets and acquirers. Stock prices reflect new information immediately according to the market efficiency (Fama, 1991). When merger announcement information becomes publicly available, investors assess this new information. Change in stock prices around the announcement date can be regarded as merger effect. Hence, it is a useful way for evaluating the impact of mergers (Bruner, 2004).

Stock-market reactions are analyzed in either short-term or long-term (Jensen and Ruback, 1983; Bruner, 2004). The three-day period around the merger announcement is an example of event window used in a short-term analysis. The period starting from the announcement day to 365 days after the announcement is an example of event window used in a long-term analysis.

Stock market has to be efficient in order to make inferences from stock price movements around merger announcement. Balaban and Kunter (1997) test the efficiency of Turkish stock market between January 1989 and July 1995. Their results show that Turkish stock market is not efficient. Ozdemir (2008) tests the efficiency of

Turkish stock market in the period January 1990 to June 2005. His study reveals that Turkish stock market is a weak form efficient market. Weak form efficiency implies that all past prices are reflected in today's price. Ozdemir (2008) examines a more recent sample compared to Balaban and Kunter (1997). The difference between the findings of these two studies may imply that Turkish stock market becomes more efficient through time.

Studies given in Table 1 summarize the stock-market reactions of target firms. All these studies use an event study as it is used in this study. These studies define abnormal return as the difference between realized return and expected return, and examine cumulative abnormal returns over a short-term event window.

Target CARs differ from market to market. Studies covering US market (Dodd, 1980; Asquith, 1983; Mulherin and Boone, 2000; Andrade et al., 2001; Bargeron et al., 2008; Kuipers et al., 2009) and European markets (Goergen and Renneboog, 2004; Campa and Hernando, 2004; Martynova and Renneboog, 2009) report significantly positive CARs to target firms. CAR to US targets ranges from 7.1% to 27.47%. However, European targets earn less CAR compared to US targets which is about 4.48% to 12.47%.

Target CARs also differ among European markets. UK targets earn more CAR than their Continental European counterparts, 17.64% and 10.19% respectively (see Martynova and Renneboog, 2009). Laws of UK establish better investor protection

**Table 1: Summary of previous studies**

This table summarizes findings of previous studies. CARs to target firms obtained in these studies are listed below.

	Cumulative Abnormal Returns	Event Window	Country Coverage	Sample Size	Sample Period
Dodd (1980)	12.44% *	[-1, +1]	US	71	1970-1977
Asquith (1983)	7.1% *	[-1, +1]	US	211	1962-1976
Mulherin and Boone (2000)	21.2% *	[-1, +1]	US	376	1990-1999
Andrade et al. (2001)	16% *	[-1, +1]	US	3,688	1973-1998
Bargeron et al. (2008)	27.47% *	[-1, +1]	US	1,667	1980-2005
Kuipers et al. (2009)	23.07% *	[-1, 0]	US	181	1982-1991
Goergen and Renneboog (2004)	9.01% *	[-1, 0]	Europe	136	1993-2000
Campa and Hernando (2004)	4.48% *	[-1, +1]	Europe	188	1998-2000
Martynova and Renneboog (2009)	12.47% *	[-1, +1]	Europe	760	1993-2001
Gopaldaswamy et al. (2008)	-0.29%	[-1, +1]	India	25	2000-2007
Wong and Cheung (2009)	-0.24%	[-1, 0]	Asia	203	2000-2007

\* denotes statistical significance at 1% level

than laws of countries in Continental Europe. The difference in CARs may arise from difference in legal systems (Goergen and Renneboog, 2004; Martynova and Renneboog, 2009).

Indian and Asian mergers neither generate nor destroy value to target firms. Gopaldaswamy et al. (2008) provide empirical evidence from India. They examine 25 mergers in the period between 2000 and 2007. CAR in the three-day event window is not statistically different than zero. Wong and Cheung (2009) investigate stock-market reaction to mergers of Asian firms. Their sample consists of mergers from Japan, China, Hong Kong, Taiwan, Singapore, and South Korea between 2000 and 2007. They report that CAR in the two-day event window  $[-1, 0]$  is not statistically different than zero.

Differences in target CARs among different markets are discussed up to here. Impact of merger characteristics on target CARs is also examined in the literature. Martynova and Renneboog (2009) find that partial majority acquisitions (less than 100% of equity) generate lower target CARs than mergers or 100% acquisitions. Targets earn 15.61% CAR in mergers or 100% acquisitions. However, average CAR is 3.46% for partial majority acquisitions. After mergers or 100% acquisitions, acquirer firm becomes the single controller of the target firm. In partial majority acquisitions, a minority stake remains at the target shareholders. Minority shareholders are worried about losing their remaining shares. Hence, value created by the merger decreases (Martynova and Renneboog, 2009).

Completed mergers generate higher CAR than incomplete mergers (Goergen and Renneboog, 2004). Completed mergers generate 10.3% CAR while incomplete ones generate 5.51% CAR in two-day event window [-1, 0]. Goergen and Renneboog (2004) prove that investors anticipate which deals will be successful. Hence, they put a higher valuation on successful deals.

Both cross-border mergers and domestic mergers generate shareholder value. Martynova and Renneboog (2009) provide that average CAR is 12.55% in domestic mergers and 11.52% in cross-border mergers. They imply that difficulties in integration between cross-border firms cause this small but significant difference. Bruner (2004) examines 17 studies comparing cross-border mergers to domestic mergers in US. These studies report either higher CARs in cross-border mergers or no difference in contrast to Martynova and Renneboog (2009). Goergen and Renneboog (2004) also compare domestic mergers to cross-border mergers in Europe. They do not find a significant difference in CARs.

Industry relatedness of target and acquirer firms is another characteristic that affects CARs to targets. Martynova and Renneboog (2009) provide evidence that CARs increase if the acquirer firm belongs to a different industry than the target firm. Acquirers make bids in a more aggressive manner to diversify their business to different industries (Martynova and Renneboog, 2009).

Payment method has a significant impact on CARs to targets. Stock-financed mergers create lower CAR than cash-financed mergers (Andrade et al., 2001). In the three-day event window, they report 13% average CAR in stock-financed mergers and 20.1% in cash-financed mergers. Andrade et al. (2001) cover US mergers. Goergen and Renneboog (2004) provide evidence from European mergers that support Andrade et al. (2001). Cash-financed mergers create 3.24% more target CARs than stock-financed mergers (Goergen and Renneboog, 2004).

Acquirer firm's status affects CARs to target firms. Target firms earn higher CARs when the acquirer firm is public (Bargeron et al., 2008). They examine 1,667 mergers in US. Acquirers are public in 1,214 deals and private in 453 deals. Targets earn 27.47% average CAR in the three-day event window for all acquirers. However, average CAR becomes 29.48% for public acquirers and 22.06% for the private ones. They explain this difference by managerial ownership. Managerial ownership in a private firm is stronger than the ownership in a public firm. An acquirer firm with lower managerial ownership tends to pay higher for a target firm. Thus, targets earn more from public acquirers (Bargeron et al., 2008).

Government control and strict regulations in an industry lower CARs to target firms (Campa and Hernando, 2004). Heavily government control in regulated industries reduces the completion possibility of a merger. Hence, investors put a lower valuation on the merger which reduces the CAR to the target firms.

## **CHAPTER III**

### **METHODOLOGY**

This study investigates whether mergers create or destroy value to target shareholders by conducting an event study. In an efficient market, all public information is reflected in the stock price. Hence, assuming no information leakages, stock market reacts to a new event at its public announcement. Movements in stock prices reflect investors' assessment of new information. Assuming market efficiency, event studies model expected returns. As in Brown and Warner (1985) and MacKinlay (1997), I use abnormal stock return to measure the impact of mergers on target shareholders. Abnormal return is the difference between realized return and expected return of a stock on a given day. Realized return is the observed stock return.

#### **3.1 Modeling Expected Returns**

Expected return is modeled using OLS market as it is done by Brown and Warner (1985). OLS market model relates the return of a stock to the return of a market index in a linear combination (MacKinlay, 1997). This statistical model computes the expected return of a stock according to its sensitivity to the market return. OLS



market model illustrates the linear relation between stock return and market return as in Equation 1.

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (1)$$

$$E(\varepsilon_{i,t}) = 0 \quad \text{Var}(\varepsilon_{i,t}) = \sigma_{\varepsilon_i}^2$$

where  $R_{i,t}$  is the return of stock  $i$  at time  $t$ ,  $R_{m,t}$  is the market return at time  $t$ . Abnormal return of stock  $i$  at time  $t$  is  $\varepsilon_{i,t}$  which is the residual term. Abnormal return,  $\varepsilon_{i,t}$ , has a zero mean and a constant variance, and is assumed to be normally distributed. Abnormal returns of an individual stock are not normally distributed (Brown and Warner, 1985). However, cross-sectional average of abnormal returns shows normal distribution properties as sample size increases according to the Central Limit Theorem (Brown and Warner, 1985).

### 3.2 Calculating Abnormal Returns and Cumulative Abnormal Returns

I difference realized (observed) returns from my estimates of expected returns to arrive at abnormal returns. Equation 2 calculates daily abnormal returns.

$$A_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{m,t}) \quad (2)$$

where  $R_{i,t}$  is the realized return of stock  $i$  at time  $t$ , and  $(\hat{\alpha}_i + \hat{\beta}_i R_{m,t})$  is the expected return of stock  $i$  at time  $t$ . Then, I compute cross-sectional average of daily abnormal returns as shown in Equation 3 for all targets in the sample.

$$\bar{A}_t = \frac{1}{N_t} \sum_{i=1}^{N_t} A_{i,t} \quad (3)$$

where  $\bar{A}_t$  is the average daily abnormal return at time  $t$ , and  $N_t$  is the number of mergers in the sample.

Cumulative abnormal return over a multi-day interval is a commonly used gauge for measuring stock-market reactions to mergers. I calculate the three-day cumulative abnormal return (from the day before the announcement to the day after the announcement) using Equation 4.

$$CAR_{[-1,+1]} = \sum_{t=-1}^{+1} \bar{A}_t \quad (4)$$

Besides the three-day event window, I also investigate seven-day and 11-day event windows for checking robustness. I compute average cumulative abnormal returns for these event windows using the same procedure.

### 3.3 Computing Test Statistics

To investigate the effects of mergers on target shareholder value, I test for the significance of abnormal returns around announcements. If mergers generate value for target shareholders, abnormal returns are significantly greater than zero. If, on the other hand, mergers destroy value, abnormal returns are significantly less than zero. If mergers neither generate nor destroy value, abnormal returns are not significantly different than zero.

I test the null hypothesis that there is no abnormal return on day  $t$ . The test statistic is the ratio of average abnormal return on that day to its estimated standard deviation. This test statistic is distributed Student- $t$ ; however, it shows unit normal distribution properties since the degree of freedom is greater than 200 (Brown and Warner, 1985).

$$\bar{A}_t / \hat{S}(\bar{A}_t) \sim N(0,1) \quad (5)$$

where

$$\hat{S}(\bar{A}_t) = \sqrt{\left( \sum_{t=T_0}^{T_1-1} (\bar{A}_t - \bar{\bar{A}})^2 \right) / (T_1 - T_0 - 1)} \quad (6)$$

$$\bar{\bar{A}} = \frac{1}{T_1 - T_0} \sum_{t=T_0}^{T_1-1} \bar{A}_t \quad (7)$$

where  $T_0$  is the starting day of estimation window, and  $T_1$  is the starting day of event window<sup>2</sup>.

I apply the same procedure to multi-day intervals for testing the significance of average cumulative abnormal returns with modifications. Since I test the significance of returns over a multi-day period, the new null hypothesis becomes there is no cumulative abnormal return in the specified multi-day interval. Also, the test statistic takes the form below for three-day event window around the merger announcement. I assume that this test statistic is unit normal.

$$CAR_{[-1,+1]} / \left( \sum_{t=-1}^{+1} \hat{S}^2(\bar{A}_t) \right)^{\frac{1}{2}} \sim N(0,1) \quad (8)$$

The numerator becomes the average cumulative abnormal return in the three-day event window. I modify the denominator to account for the standard deviation of a three-day interval instead of a single day.

### 3.4 Estimating $\alpha$ and $\beta$ Coefficients

I estimate  $\hat{\alpha}_i$  and  $\hat{\beta}_i$  coefficients for each stock  $i$  using OLS regression. I define two time windows before running OLS regressions to compute  $\hat{\alpha}_i$  and  $\hat{\beta}_i$  coefficients.

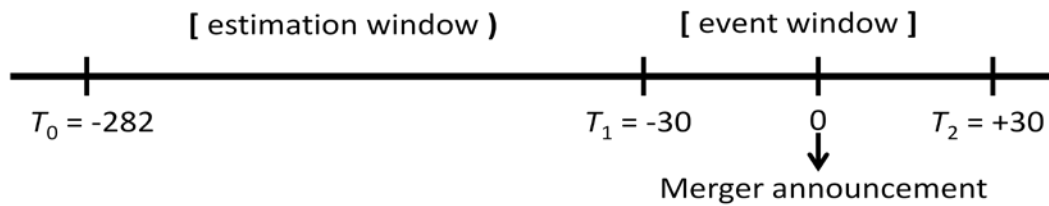
These windows are estimation window and event window. Former is the window for

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<sup>2</sup> I define estimation window and event window in Section 3.4.

estimation of expected returns ( $\hat{\alpha}_i$  and  $\hat{\beta}_i$  estimates), and the latter is the window for calculating abnormal returns.

I define the event window as starting 30 days prior to the merger announcement and ending 30 days after the announcement. The estimation window covers the 252-day days before the event window. Figure 1 illustrates the merger timeline.



**Figure 1: Merger timeline**

The estimation and event windows do not overlap, so as to eliminate the effect of mergers from the estimation of the expected returns. Assuming an efficient market, returns in the short event-window around the merger announcement should reflect the investors' assessment of the effect of merger on shareholder value. The estimation window is 252 days which is similar to what Brown and Warner (1985) and MacKinlay (1997) use.

After defining the estimation window, next step is computing  $\hat{\alpha}_i$  and  $\hat{\beta}_i$  coefficients. I run OLS regression using Equation 1 in the estimation window ( $t = T_0, \dots, T_1 - 1$ ) for each stock. A firm can make several merger announcements in different times. Market beta of that firm may change through time. So, if a firm makes more than one

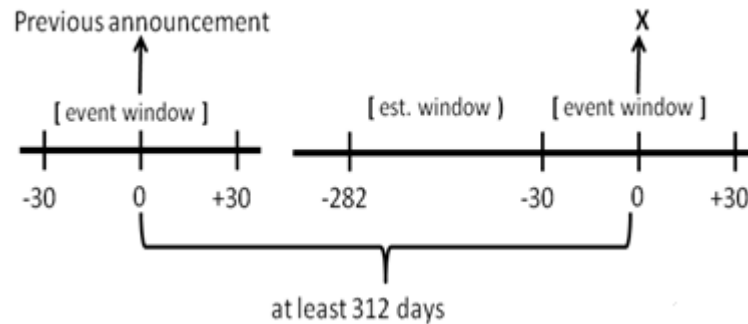
merger announcement, I will estimate OLS coefficients of that firm's stock for each merger.

$T_0 = -282$ ,  $T_1 = -30$ , and  $T_2 = +30$  as illustrated in Figure 1. Given these time indices, Equation 1 estimates  $\hat{\alpha}_i$  and  $\hat{\beta}_i$  coefficients for each merger. Equation 2 computes daily abnormal returns from day -282 to day +30 for each merger. Equation 3 calculates the average abnormal returns from day -282 to day +30. Equation 4 computes the average three-day cumulative abnormal return. Finally, Equation 5 and Equation 8 construct the test statistics for average ARs and average three-day CAR, respectively.

### **3.5 Definition of Confounding Mergers and Elimination Procedure**

If a target firm makes a previous merger announcement in 312 days before the current announcement, I call current merger confounding. I remove confounding mergers, because confounding mergers would distort abnormal returns. My study relies on the assumption that stock market reacts to event announcements in the short window surrounding the announcements. Hence, estimation window and event window of a merger should not overlap other merger announcements. Otherwise, another merger announcement, that takes place in estimation window, would distort OLS coefficients and this would distort ARs and CARs.

Figure 2 describes the timeline for filtering out confounding events. Any merger announcement that follows a merger announcement of the same firm by less than 312 days drops out of the sample.



**Figure 2: Non-confounding merger timeline**

In Figure 2, X represents the announcement of interest. Post-event window of the previous announcement and estimation window of X should not overlap. To satisfy this, at least 312 days should pass between the current announcement and the previous announcement. Restrictions on the difference between the current announcement and the next announcement exist. For example, a target firm may make multiple merger announcements in short time period with the same acquirer. In such a case, the stock market reaction is assumed to be concentrate around the first announcement, because investors assess the initial announcement more unexpected than the subsequent announcements (Jensen and Ruback, 1983). Therefore, I hold the initial announcement in the sample and remove all subsequent announcements. I refer to this type of mergers as multiple stage mergers.

## **CHAPTER IV**

### **DATA**

I need to collect the sample of mergers, the merger announcement dates, daily returns of target shares and daily returns of a market index in order to apply the method outlined in the previous chapter.

First, I compile the sample of mergers. I collect merger using Securities Data Company (SDC) International M&A Database. I refer to Factiva, MarketLine, and Istanbul Stock Exchange (ISE) M&A Announcements for increasing sample size. Second, I cross-check the announcement dates using ISE Company News. Third, I collect merger terms using SDC. I use the earlier date if a conflict occurs among the sources. Fourth, I obtain daily stock returns and daily market returns (ISE-100 returns in this study) from Datastream.

#### **4.1 Merger Sample**

The sample of merger deals come from SDC International M&A Database. All targets are Turkish, publicly traded and non-financial firms. Istanbul Stock Exchange (ISE) was established in 1986; so, I start searching for deals from 1986. Last access



to SDC International M&A Database was in April 2006. Table 2 shows the results of the filters. Applying the procedure for eliminating confounding mergers reduces the sample from 142 to 95 deals.

**Table 2: Filters applied to SDC International M&A Database**

This table shows the filters I apply to SDC International M&A Database. I find 142 mergers after filtering out the database.

<i>Target Firm</i>	
Turkish	1,544 hits
Publicly Traded	285 hits
Non-Financial	198 hits
<i>Announcement Date</i>	
01/01/1986 - 30/04/2006	142 hits

I augment the merger sample by perusing merger announcements in newspapers using Factiva. I search for Turkish mergers from 1986 to 2009. The search criteria are in Appendix A. I include mergers in which target firms are Turkish, publicly traded, and non-financial. The Factiva deals for the period 1986-2006 overlap with SDC International M&A Database. I append 17 non-confounding mergers to the sample using Factiva deals after 2006.

The MarketLine Database is another source to augment the merger sample. MarketLine Database keeps track of mergers. I examine both completed and incomplete mergers announced. I add 10 non-confounding mergers using MarketLine.

ISE M&A Announcements is the final data source for enlarging the sample. ISE discloses information about mergers in which at least one party is publicly traded in ISE. I add three mergers from these disclosures since ISE announcements started in 2007.

#### **4.2 Checking the Validity of Announcement Dates**

I check the validity of announcement dates using ISE Company News for each firm listed in the sample. I examine news starting from two years before the announcement date. If I find an earlier announcement using ISE Company News than the announcement given by the other sources, I use earlier date as the announcement date. In addition to updating the announcement dates, I use ISE Company News to fill any missing merger terms that may exist in the merger data from SDC.

#### **4.3 Collecting Daily Returns**

This study analyzes the daily abnormal returns and cumulative abnormal returns in the three-day event window. I obtain daily adjusted stock prices ( $P_{i,t}$ ) and ISE-100 index from Datastream. Datastream defines adjusted price as the official closing price which is adjusted for capital actions. Daily stock return is the daily percentage change in adjusted stock price. I compute daily stock returns ( $R_{i,t}$ ) as in Equation 9.

$$R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} \quad (9)$$

ISE-100 index is the market benchmark. Daily percentage change in ISE-100 index is the daily market return. I collect stock and market returns from 01/06/1990 to 10/09/2009 on a daily basis.

#### **4.4 Descriptive Statistics on the Sample and Merger Characteristics**

The final sample consists of 125 merger announcements between July 1991 and July 2009. Five of them are multiple stage mergers. All target firms are publicly traded, non-financial, and Turkish. 83 merger announcements are completed. Control rights of target firm change hands in 52 mergers. Table 3 presents descriptive statistics about the merger characteristics.

The difference between average and median transaction values is due to the presence of large mergers. There are 13 mergers with transaction values greater than 1 billion TL. I classify firms according to Two-Digit SIC Codes. If Two-Digit SIC Code of target and acquirer is the same, I refer to this merger as intra-industry merger. 39% of the deals are intra-industry mergers. 44.8% of mergers are domestic while 41.6% of mergers are cross-border. Acquirer's nationality is unknown for the remaining 13.6%.

**Table 3: Descriptive statistics about the merger characteristics**

Panels A and B shows the number of: (i) completed and incomplete mergers; (ii) control-changing and non-control-changing mergers. Panel C provides average, median and total transaction values in nominal and real terms. Panels D to G partitions the sample by: (i) intra-industry mergers; (ii) acquirer nation; (iii) attitude of acquirer; (iv) status of acquirer. Panel H shows average and median of shares acquired.

<b>PANEL A – Merger Status</b>		
Completed		83
Incomplete		42
<b>PANEL B – Control Change</b>		
Control-Changing		52
Non-Control Changing		73
<b>PANEL C – Transaction Value</b>		<i>n = 85 (where applicable)</i>
	<b>Nominal (Million TL)</b>	<b>Real (2009 Million TL)</b>
Average	353	729
Median	51	150
Total	30,020	61,955
<b>PANEL D – Intra-Industry</b>		39%
<b>PANEL E – Acquirer Nation</b>		
Domestic		44.8%
Cross-Border		41.6%
Unknown		13.6%
<b>PANEL F – Attitude</b>		
Friendly		48.0%
Neutral		18.4%
Not Applicable		33.6%
<b>PANEL G – Acquirer Status</b>		
Private		39.2%
Public		24.8%
Subsidiary		11.2%
Joint Venture		2.4%
Investor		0.8%
Unknown		21.6%
<b>PANEL H – Share Distribution</b>		<i>n = 111 (where applicable)</i>
Average % of shares acquired		40%
Median % of shares acquired		40%

Table 4 shows the yearly distribution of mergers. Even though the sample starts from 1986, I observe the first merger in 1991. 1995 and 1998 are years with large number of mergers. Merger activity peaked in 2001 and 2007. However, this sample does not completely map the merger history of Turkey, since I only deal with mergers in which target firm is publicly traded and non-financial.

**Table 4: Sample composition by years**

This table gives the number of deals per year. Average and total transaction values per year are provided for mergers in which transaction values are available. All transaction values are given in December 2009 TL.

	<b># of Mergers</b>	<b>Avg. Transaction Value</b>	<b>Total Transaction Value</b>
<b>1991</b>	1	0	0
<b>1992</b>	0	0	0
<b>1993</b>	7	1,205,623,118	3,616,869,353
<b>1994</b>	2	69,214,009	69,214,009
<b>1995</b>	12	249,722,926	1,748,060,479
<b>1996</b>	5	239,840,695	239,840,695
<b>1997</b>	4	1,744,725,399	5,234,176,196
<b>1998</b>	12	222,705,368	2,449,759,047
<b>1999</b>	2	212,570,564	212,570,564
<b>2000</b>	10	1,213,113,188	8,491,792,318
<b>2001</b>	15	97,535,566	877,820,095
<b>2002</b>	8	316,417,432	949,252,297
<b>2003</b>	8	914,092,738	4,570,463,689
<b>2004</b>	0	0	0
<b>2005</b>	10	2,205,821,147	22,058,211,475
<b>2006</b>	4	275,632,662	1,102,530,647
<b>2007</b>	15	688,253,332	8,259,039,981
<b>2008</b>	8	292,446,775	2,047,127,424
<b>2009</b>	2	28,015,321	28,015,321

I also examine yearly distribution of merger activity in terms of transaction value whenever data is available. Transaction values are available for 85 of 125 mergers. I collect Consumer Price Index to adjust the nominal transaction values based on December 2009. Table 4 also provides real transaction values per year. Both total and average real transaction values make a peak in 2005 due to large mergers like Turkcell, TUPRAS, and Ereğli Demir Celik.

I classify mergers as domestic or cross-border. Table 5 tabulates acquirers according to the nation. Acquirers in 56 deals are Turkish firms. Germany and United Kingdom are the next two nations with highest number of deals. There are 17 mergers in which acquirer firm's nation is unknown. Unknown nations are related to seeking buyer announcements made by target firms. According to SDC, seeking buyer announcements are announcements in which target firm reveals plans to seek out a buyer for its assets.

Table 6 tabulates deals according to acquirer and target industries. Mergers cluster in two industries which are "Food and kindred products" and "Stone, clay, and glass products". These two industries may be exposed to deregulation or industry shocks. This observation fits in to the literature since the literature proves merger activity clusters in industries.

Appendix B lists target and acquirer names, control-change status, merger status, announcement date, and transaction value of all mergers in the sample.

**Table 5: Sample composition by countries of acquirer firms**

This table gives the number of deals by acquirer firm's country.

<b>Acquirer's Nation</b>	<b># of Mergers</b>
<i>Turkey</i>	<i>56</i>
Germany	10
United Kingdom	9
Belgium	4
Netherlands	4
United States	3
Italy	2
France	2
Austria	2
Denmark	2
Switzerland	2
Egypt	1
Greece	1
Brazil	1
Czech Republic	1
Finland	1
Israel	1
Kazakhstan	1
Luxembourg	1
Poland	1
Singapore	1
Spain	1
Sweden	1
<i>Cross-Border</i>	<i>52</i>
<i>Unknown</i>	<i>17</i>

**Table 6: Sample composition by industries of target and acquirer firms**

This table gives the number of deals by industries of target and acquirer firms. Classification is made by two-digit SIC codes.

<b>Two-Digit SIC Code and Name</b>		<b>Target</b>	<b>Acquirer</b>
13	Oil and Gas Extraction	2	2
14	Nonmetallic Minerals, except Fuels	2	1
20	Food and Kindred Products	16	14
22	Textile Mill Products	3	3
26	Paper and Allied Products	6	1
27	Printing and Publishing	7	2
28	Chemicals and Allied Products	9	5
29	Petroleum and Coal Products	13	1
30	Rubber and Misc. Plastics Products	2	3
32	Stone, Clay, and Glass Products	15	7
33	Primary Metal Industries	6	2
34	Fabricated Metal Products	2	1
35	Industrial Machinery and Equipment	4	1
36	Electronic & Other Electric Equipment	5	4
37	Transportation Equipment	5	8
45	Transportation by Air	5	1
48	Communications	4	1
49	Electric, Gas, and Sanitary Services	3	2
50	Wholesale Trade - Durable Goods	1	-
51	Wholesale Trade - Nondurable Goods	3	5
53	General Merchandise Stores	2	-
54	Food Stores	5	3
58	Eating and Drinking Places	1	-
59	Miscellaneous Retail	1	-
60	Depository Institutions	-	4
61	Nondepository Institutions	-	1
62	Security and Commodity Brokers	-	5
63	Insurance Carriers	-	2
67	Holding & Other Investment Offices	-	43
70	Hotels and Other Lodging Places	1	-
73	Business Services	-	1
75	Auto Repair, Services, and Parking	-	1
78	Motion Pictures	1	-
87	Engineering & Management Services	1	-
-	Unknown	-	1



## **CHAPTER V**

### **EMPIRICAL RESULTS**

This chapter discusses the empirical results on whether mergers generate or destroy value to Turkish target shareholders. First, I analyze daily abnormal returns. Cumulative abnormal return analysis follows daily abnormal returns. I conduct the analysis in the full sample and in subsamples according to control-change status and final status of deals. Finally, I analyze impact of merger characteristics, such as cross-border merger, intra-industry merger, and transaction value, on CAR in the three-day event window.

#### **5.1 Average Daily Abnormal Returns**

Equation 3 computes average daily abnormal returns. I test their statistical significance using Equation 5. I examine average ARs in the event window which is the 61-day window around merger announcement.

##### **5.1.1 Average ARs in Full Sample**

I notice significant average ARs on the day before announcement, the announcement day, and the day after announcement. In line with the finding of significant ARs in

the three-day window, the ARs are 1.22%, 2.04%, and 1.62% with t-statistics of 3.33, 5.55, and 4.40, respectively. Target firms earn significant and positive AR. No significant AR is detected in the rest of the event window. Average adjusted  $R^2$  for all the 125 OLS regressions that estimate  $\hat{\alpha}_i$  and  $\hat{\beta}_i$  is 31%. Table 7 provides average ARs and the related t-statistics.

**Table 7: Average ARs in all mergers**

This table shows average ARs to target firms in the 61-day event window. Abnormal returns are the difference between realized returns and expected returns. I use OLS market model to compute expected returns. The test statistic is the ratio of average abnormal return on a day to its estimated standard deviation.

Full Sample 125 Mergers						
Day	AR (%)	t-stat		Day	AR (%)	t-stat
-30	0.70	1.91		1	1.62	4.40 *
-29	-0.18	-0.49		2	0.81	2.22
-28	0.31	0.85		3	-0.43	-1.18
-27	-0.10	-0.28		4	-0.87	-2.37
-26	-0.28	-0.77		5	-0.41	-1.11
-25	-0.74	-2.01		6	-0.29	-0.78
-24	-0.21	-0.56		7	-0.01	-0.03
-23	0.11	0.29		8	-0.04	-0.12
-22	0.23	0.62		9	-0.23	-0.63
-21	0.20	0.54		10	0.55	1.50
-20	-0.44	-1.19		11	-0.15	-0.41
-19	-0.50	-1.37		12	-0.45	-1.23
-18	0.39	1.05		13	-0.55	-1.49
-17	0.20	0.55		14	-0.27	-0.73
-16	0.09	0.25		15	0.65	1.77
-15	0.31	0.84		16	-0.13	-0.35
-14	0.09	0.24		17	0.43	1.17
-13	0.30	0.81		18	-0.70	-1.90
-12	0.13	0.34		19	-0.20	-0.56
-11	0.36	0.99		20	-0.44	-1.20
-10	-0.35	-0.96		21	-0.29	-0.78
-9	0.01	0.01		22	0.01	0.04
-8	-0.69	-1.87		23	-0.23	-0.64
-7	-0.25	-0.67		24	-0.33	-0.90
-6	0.21	0.57		25	0.06	0.17
-5	0.67	1.81		26	0.02	0.05
-4	0.30	0.82		27	-0.63	-1.72
-3	0.27	0.72		28	-0.70	-1.91
-2	0.42	1.15		29	0.61	1.65
-1	1.22	3.33 *		30	-0.08	-0.22
0	2.04	5.55 *				

\* denotes statistical significance at 1% level

### **5.1.2 Average ARs in Control-Changing versus Non-Control-Changing Mergers**

I compare ARs in control-changing mergers to ARs in non-control-changing mergers. There are 52 control-changing mergers. Average ARs to target firms are significant and positive on days -1, 0, and 1 for control-changing mergers. Average ARs are 2.87%, 2.87%, and 2.82%, respectively. Table 8 provides average ARs in the 61-day event window in control-changing mergers. I also examine significant ARs on days 4 and 29. Negative AR on day 4 may indicate a reaction to the run-up in stock prices around the announcement date. Positive AR on day 29 loses its significance when I crop 0.5% of the daily returns in the lower and upper tails. There are 73 non-control-changing mergers in the sample. I notice significant AR only on the announcement day. Target firms realize a small but significant average AR of 1.44% on day 0. I do not find any significant AR on the remaining 60 days in event window. Table 9 shows ARs and the related t-statistics in non-control-changing mergers.

Significant ARs detected in the full sample arises from control-changing mergers. I find a stronger stock-market reaction in control-changing mergers than the reaction in non-control-changing mergers. This is an expected result in accordance with the literature. Minority share acquisitions do not create as strong an impact as majority share acquisitions (Martynova and Renneboog, 2009).

**Table 8: Average ARs in control-changing mergers**

This table shows average ARs to target firms in the 61-day event window. Abnormal returns are the difference between realized returns and expected returns. I use OLS market model to compute expected returns. The test statistic is the ratio of average abnormal return on a day to its estimated standard deviation.

Control-Changing 52 Mergers						
Day	AR (%)	<i>t-stat</i>		Day	AR (%)	<i>t-stat</i>
-30	0.23	0.46		1	2.82	5.56 *
-29	-0.39	-0.77		2	0.26	0.52
-28	0.93	1.82		3	-0.18	-0.36
-27	-0.40	-0.80		4	-1.46	-2.87 *
-26	0.24	0.47		5	0.33	0.64
-25	-0.79	-1.55		6	-0.37	-0.73
-24	0.54	1.06		7	0.04	0.09
-23	0.51	1.01		8	-0.33	-0.64
-22	0.36	0.71		9	-0.07	-0.14
-21	0.33	0.64		10	0.42	0.82
-20	-0.62	-1.21		11	0.34	0.67
-19	-1.05	-2.07		12	-0.32	-0.62
-18	0.61	1.20		13	-0.67	-1.31
-17	-0.57	-1.13		14	-0.47	-0.93
-16	-0.11	-0.22		15	0.17	0.34
-15	0.88	1.73		16	0.03	0.07
-14	0.50	0.99		17	0.21	0.41
-13	0.17	0.34		18	-0.42	-0.83
-12	0.40	0.80		19	-0.06	-0.12
-11	0.65	1.29		20	-0.40	-0.79
-10	-0.31	-0.61		21	-0.63	-1.24
-9	-0.32	-0.62		22	0.01	0.02
-8	-0.24	-0.47		23	0.21	0.41
-7	0.16	0.32		24	-0.03	-0.06
-6	0.73	1.44		25	0.01	0.02
-5	0.73	1.44		26	-0.35	-0.69
-4	0.05	0.10		27	-0.63	-1.23
-3	0.48	0.95		28	-0.48	-0.95
-2	1.04	2.05		29	1.36	2.67 *
-1	2.87	5.65 *		30	-0.31	-0.62
0	2.87	5.66 *				

\* denotes statistical significance at 1% level

**Table 9: Average ARs in non-control-changing mergers**

This table shows average ARs to target firms in the 61-day event window. Abnormal returns are the difference between realized returns and expected returns. I use OLS market model to compute expected returns. The test statistic is the ratio of average abnormal return on a day to its estimated standard deviation.

Non-Control-Changing 73 Mergers						
Day	AR (%)	<i>t-stat</i>		Day	AR (%)	<i>t-stat</i>
-30	1.03	2.16		1	0.76	1.58
-29	-0.03	-0.06		2	1.21	2.52
-28	-0.12	-0.26		3	-0.62	-1.29
-27	0.11	0.23		4	-0.45	-0.94
-26	-0.65	-1.36		5	-0.93	-1.94
-25	-0.70	-1.46		6	-0.23	-0.47
-24	-0.74	-1.54		7	-0.05	-0.10
-23	-0.18	-0.38		8	0.16	0.34
-22	0.13	0.27		9	-0.35	-0.73
-21	0.11	0.22		10	0.65	1.35
-20	-0.31	-0.64		11	-0.51	-1.06
-19	-0.11	-0.24		12	-0.55	-1.15
-18	0.23	0.47		13	-0.46	-0.97
-17	0.76	1.58		14	-0.12	-0.25
-16	0.24	0.50		15	1.00	2.08
-15	-0.09	-0.20		16	-0.25	-0.52
-14	-0.21	-0.44		17	0.59	1.23
-13	0.39	0.81		18	-0.90	-1.88
-12	-0.07	-0.15		19	-0.31	-0.64
-11	0.16	0.33		20	-0.47	-0.98
-10	-0.38	-0.80		21	-0.04	-0.08
-9	0.23	0.49		22	0.02	0.04
-8	-1.00	-2.09		23	-0.56	-1.16
-7	-0.54	-1.12		24	-0.55	-1.14
-6	-0.17	-0.35		25	0.10	0.20
-5	0.62	1.29		26	0.29	0.60
-4	0.48	1.00		27	-0.64	-1.33
-3	0.11	0.23		28	-0.86	-1.80
-2	-0.02	-0.04		29	0.07	0.14
-1	0.05	0.10		30	0.09	0.18
0	1.44	3.01 *				

\* denotes statistical significance at 1% level

### **5.1.3 Average ARs in Completed versus Incomplete Mergers**

Table 10 and Table 11 provide ARs in completed and incomplete mergers, respectively. There are significant ARs on days -1, 0, and 1 in completed mergers. Average ARs are 1.77%, 2.52%, and 1.79% with t-statistics of 4.10, 5.81, and 4.13. Target firms are the winners in completed mergers as they are so in control-changing mergers. There is not significant AR in incomplete mergers.

Investors do not know whether a merger will successfully complete or fail at the announcement date. However, the difference in market reactions to completed mergers and incomplete mergers show that investors may anticipate the successful conclusion of mergers. Therefore, investors put a higher valuation on mergers which will be completed.

### **5.1.4 Average ARs in Control-Changing and Completed Mergers**

Merger literature focuses on studies examining both control-changing and completed mergers. 42 of 125 mergers are both control-changing and completed in this study. I find significant ARs of 3.31%, 3.09%, and 2.53% on days -1, 0, and 1, respectively. These ARs are slightly greater than ARs in control-changing mergers, because there is no incomplete merger in this subsample. Table 12 presents the associated ARs and t-statistics<sup>3</sup>.

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<sup>3</sup> Appendix C provides the ARs and t-statistics in the remaining three subsamples.

**Table 10: Average ARs in completed mergers**

This table shows average ARs to target firms in the 61-day event window. Abnormal returns are the difference between realized returns and expected returns. I use OLS market model to compute expected returns. The test statistic is the ratio of average abnormal return on a day to its estimated standard deviation.

Completed 83 Mergers						
Day	AR (%)	<i>t-stat</i>		Day	AR (%)	<i>t-stat</i>
-30	0.35	0.80		1	1.79	4.13 *
-29	-0.01	-0.02		2	0.88	2.04
-28	0.11	0.25		3	-0.34	-0.79
-27	-0.02	-0.06		4	-0.99	-2.29
-26	-0.43	-1.00		5	-0.26	-0.61
-25	-0.86	-1.99		6	-0.87	-2.00
-24	0.00	0.00		7	-0.25	-0.58
-23	0.06	0.15		8	0.19	0.45
-22	0.15	0.34		9	-0.25	-0.58
-21	-0.11	-0.26		10	0.71	1.65
-20	-0.14	-0.31		11	-0.01	-0.03
-19	-0.56	-1.29		12	-0.58	-1.33
-18	0.51	1.17		13	-0.77	-1.79
-17	0.24	0.57		14	-0.27	-0.61
-16	0.64	1.47		15	0.53	1.23
-15	0.25	0.58		16	-0.19	-0.44
-14	0.33	0.76		17	0.57	1.33
-13	0.26	0.60		18	-0.66	-1.53
-12	0.64	1.49		19	-0.17	-0.39
-11	0.03	0.08		20	-0.62	-1.44
-10	-0.53	-1.22		21	-0.87	-2.02
-9	-0.06	-0.13		22	-0.06	-0.14
-8	-0.75	-1.74		23	-0.22	-0.50
-7	-0.07	-0.17		24	-0.56	-1.30
-6	0.52	1.21		25	0.03	0.07
-5	0.91	2.11		26	-0.16	-0.38
-4	0.68	1.57		27	-0.95	-2.19
-3	0.19	0.44		28	-0.39	-0.91
-2	0.84	1.94		29	1.08	2.50
-1	1.77	4.10 *		30	-0.12	-0.27
0	2.52	5.81 *				

\* denotes statistical significance at 1% level

**Table 11: Average ARs in incomplete mergers**

This table shows average ARs to target firms in the 61-day event window. Abnormal returns are the difference between realized returns and expected returns. I use OLS market model to compute expected returns. The test statistic is the ratio of average abnormal return on a day to its estimated standard deviation.

<b>Incomplete 42 Mergers</b>						
<b>Day</b>	<b>AR (%)</b>	<b><i>t-stat</i></b>		<b>Day</b>	<b>AR (%)</b>	<b><i>t-stat</i></b>
-30	1.40	2.33		1	1.28	2.12
-29	-0.52	-0.86		2	0.68	1.13
-28	0.72	1.20		3	-0.62	-1.04
-27	-0.26	-0.44		4	-0.63	-1.05
-26	0.02	0.03		5	-0.69	-1.15
-25	-0.49	-0.82		6	0.86	1.43
-24	-0.61	-1.02		7	0.45	0.76
-23	0.19	0.32		8	-0.50	-0.84
-22	0.39	0.65		9	-0.20	-0.33
-21	0.81	1.35		10	0.23	0.39
-20	-1.03	-1.71		11	-0.42	-0.70
-19	-0.40	-0.67		12	-0.21	-0.35
-18	0.15	0.25		13	-0.11	-0.18
-17	0.12	0.20		14	-0.27	-0.45
-16	-0.98	-1.63		15	0.88	1.46
-15	0.43	0.71		16	-0.01	-0.02
-14	-0.40	-0.66		17	0.14	0.24
-13	0.38	0.63		18	-0.77	-1.28
-12	-0.90	-1.50		19	-0.27	-0.46
-11	1.02	1.69		20	-0.08	-0.14
-10	0.00	0.00		21	0.86	1.44
-9	0.13	0.21		22	0.16	0.27
-8	-0.55	-0.91		23	-0.27	-0.45
-7	-0.59	-0.98		24	0.12	0.19
-6	-0.42	-0.69		25	0.12	0.20
-5	0.17	0.29		26	0.37	0.62
-4	-0.45	-0.74		27	-0.02	-0.04
-3	0.41	0.68		28	-1.31	-2.17
-2	-0.40	-0.67		29	-0.32	-0.53
-1	0.13	0.22		30	-0.01	-0.02
0	1.09	1.82				

\* denotes statistical significance at 1% level



**Table 12: Average ARs in control-changing and completed mergers**

This table shows average ARs to target firms in the 61-day event window. Abnormal returns are the difference between realized returns and expected returns. I use OLS market model to compute expected returns. The test statistic is the ratio of average abnormal return on a day to its estimated standard deviation.

Control-Changing and Completed 42 Mergers						
Day	AR (%)	<i>t-stat</i>		Day	AR (%)	<i>t-stat</i>
-30	0.02	0.04		1	2.53	4.45 *
-29	-0.59	-1.03		2	0.23	0.41
-28	0.90	1.58		3	0.06	0.10
-27	-0.38	-0.66		4	-1.18	-2.08
-26	0.35	0.61		5	0.15	0.26
-25	-0.70	-1.23		6	-0.88	-1.55
-24	0.41	0.72		7	-0.67	-1.18
-23	0.36	0.64		8	-0.04	-0.08
-22	0.15	0.26		9	0.10	0.17
-21	0.31	0.54		10	0.14	0.25
-20	-0.31	-0.54		11	0.15	0.27
-19	-1.16	-2.04		12	-0.33	-0.58
-18	0.80	1.40		13	-0.94	-1.66
-17	-0.36	-0.63		14	-1.09	-1.92
-16	0.43	0.76		15	0.19	0.33
-15	0.46	0.81		16	-0.03	-0.06
-14	0.62	1.08		17	0.33	0.58
-13	0.30	0.53		18	-0.70	-1.22
-12	0.53	0.93		19	-0.21	-0.37
-11	0.62	1.09		20	-0.37	-0.65
-10	-0.41	-0.72		21	-1.07	-1.88
-9	-0.37	-0.66		22	-0.36	-0.63
-8	-0.41	-0.72		23	-0.15	-0.26
-7	0.11	0.19		24	0.12	0.20
-6	0.83	1.45		25	0.02	0.03
-5	0.58	1.01		26	-0.47	-0.83
-4	0.36	0.64		27	-0.74	-1.29
-3	0.33	0.59		28	-0.45	-0.80
-2	1.41	2.49		29	1.57	2.76 *
-1	3.31	5.82 *		30	-0.53	-0.93
0	3.09	5.43 *				

\* denotes statistical significance at 1% level

## 5.2 Average Cumulative Abnormal Returns

Daily ARs are useful to gain insight on stock-market reactions to mergers. CAR in a multi-day event window may prove useful for analyzing the aggregate impact of mergers. I analyze CARs in the three-day, seven-day, and 11-day event windows. Three-day event window is the most commonly used window in the literature (Andrade et al., 2001). I examine seven-day and 11-day windows for robustness. Equation 4 computes CARs. Equation 8 constructs the test statistics.

### 5.2.1 Average CARs in Full Sample

Average CARs to target firms is 4.88% in the three-day event window. In the seven-day event window, CAR rises to 5.94% and to 5.63% in the 11-day window. Average CARs are significant at 1% level in all event windows. Table 13 presents the results in the full sample.

**Table 13: Average CARs in all mergers**

This table shows average CARs to target firms in three different event windows. Cumulative abnormal returns are the summation of ARs over multi-day event windows. The test statistic is the ratio of average CAR in the multi-day period to its estimated standard deviation.

<b>Full Sample 125 Mergers</b>		
<b>Period</b>	<b>CAR (%)</b>	<b><i>t-stat</i></b>
[-1, +1]	4.88	7.67 *
[-3, +3]	5.94	6.12 *
[-5, +5]	5.63	4.63 *

\* denotes statistical significance at 1% level

### 5.2.2 Average CARs in Control-Changing versus Non-Control-Changing Mergers

The empirical analysis compares CARs in control-changing mergers to CARs in non-control-changing mergers. Control-changing mergers may result in higher stock-market reaction than non-control-changing ones due to the value of control rights.

Turkish target firms earn a significant 8.56% average CAR in the three-day event window. Furthermore, average CAR increases to 10.17% in the seven-day event window and 9.82% in the 11-day event window. These CARs are also significant at 1%. Table 14 summarizes the results for control-changing mergers.

Stock market puts a lower value on non-control-changing mergers. Average target CAR is 2.25% in the three-day event window and significant at 1% level. In the seven-day and 11-day event windows, CAR loses its significance. Table 15 presents average CARs and t-statistics for non-control-changing mergers.

**Table 14: Average CARs in control-changing mergers**

This table shows average CARs to target firms in three different event windows. Cumulative abnormal returns are the summation of ARs over multi-day event windows. The test statistic is the ratio of average CAR in the multi-day period to its estimated standard deviation.

<b>Control-Changing 52 Mergers</b>		
<b>Period</b>	<b>CAR (%)</b>	<b><i>t-stat</i></b>
[-1, +1]	8.56	9.74 *
[-3, +3]	10.17	7.57 *
[-5, +5]	9.82	5.83 *

\* denotes statistical significance at 1% level

**Table 15: Average CARs in non-control-changing mergers**

This table shows average CARs to target firms in three different event windows. Cumulative abnormal returns are the summation of ARs over multi-day event windows. The test statistic is the ratio of average CAR in the multi-day period to its estimated standard deviation.

<b>Non-Control-Changing 73 Mergers</b>		
<b>Period</b>	<b>CAR (%)</b>	<b><i>t-stat</i></b>
[-1, +1]	2.25	2.71 *
[-3, +3]	2.93	2.31
[-5, +5]	2.65	1.67

\* denotes statistical significance at 1% level

### **5.2.3 Average CARs in Completed versus Incomplete Mergers**

In comparison of CARs in completed mergers to CARs in incomplete mergers, I find that completed mergers create a positive stock-market reaction on target shares while incomplete mergers have no significant effect.

In the three-day event window, average CAR is 6.08%. This return is significant at the 1% level. On the other hand, I record an insignificant 2.5% average CAR in incomplete mergers subsample. Average CAR increases to 7.65% and 8% in the seven-day and 11-day event windows, respectively, in the completed mergers subsample. In contrast, I find no significant CARs in incomplete mergers subsample in the seven-day and 11-day event windows. Tables 16 and 17 provide the results for completed mergers and incomplete mergers, respectively.

**Table 16: Average CARs in completed mergers**

This table shows average CARs to target firms in three different event windows. Cumulative abnormal returns are the summation of ARs over multi-day event windows. The test statistic is the ratio of average CAR in the multi-day period to its estimated standard deviation.

<b>Completed 83 Mergers</b>		
<b>Period</b>	<b>CAR (%)</b>	<b><i>t-stat</i></b>
[-1, +1]	6.08	8.11 *
[-3, +3]	7.65	6.68 *
[-5, +5]	8.00	5.57 *

\* denotes statistical significance at 1% level

**Table 17: Average CARs in incomplete mergers**

This table shows average CARs to target firms in three different event windows. Cumulative abnormal returns are the summation of ARs over multi-day event windows. The test statistic is the ratio of average CAR in the multi-day period to its estimated standard deviation.

<b>Incomplete 42 Mergers</b>		
<b>Period</b>	<b>CAR (%)</b>	<b><i>t-stat</i></b>
[-1, +1]	2.50	2.40
[-3, +3]	2.56	1.61
[-5, +5]	0.97	0.49

\* denotes statistical significance at 1% level

### 5.2.4 Average CARs in Control-Changing and Completed Mergers

Highest average CARs are detected in the control-changing and completed mergers subsample. Targets on average realize CARs of 8.93% in the three-day event window. CARs increase to 10.96% in the seven-day event window and stays at 10.87% in the 11-day window. CARs are significant at 1% in all event windows. Table 18 shows the results<sup>4</sup>.

**Table 18: Average CARs in control-changing and completed mergers**

This table shows average CARs to target firms in three different event windows. Cumulative abnormal returns are the summation of ARs over multi-day event windows. The test statistic is the ratio of average CAR in the multi-day period to its estimated standard deviation.

<b>Control-Changing and Completed 42 Mergers</b>		
<b>Period</b>	<b>CAR (%)</b>	<b><i>t-stat</i></b>
[-1, +1]	8.93	9.07 *
[-3, +3]	10.96	7.29 *
[-5, +5]	10.87	5.77 *

\* denotes statistical significance at 1% level

### 5.3 Merger Characteristics That Affect Cumulative Abnormal Returns

This study examines the impact of terms, such as cross-border mergers, intra-industry mergers and transaction values, on three-day CAR. To investigate the effect of merger terms on three-day CAR, I conduct a regression analysis. I use CARs in the three-day event window as the dependent variable. Independent variables are the

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<sup>4</sup> Appendix D presents the CARs and t-statistics in the remaining three subsamples.

merger characteristics. These characteristics are cross-border merger, intra-industry merger and transaction value. I show in the previous sections that control-change and merger status affect CAR. Hence, I include these variables as independent variables. I represent these characteristics using three dummy variables except for the transaction value. The first dummy variable takes a value of one if the merger is control-changing. The second and third dummies take one if the merger is completed and intra-industry, respectively. Logarithms of adjusted transaction values are taken for the last independent variable. I apply this regression analysis to a dataset in which all of the characteristics are applicable which results in a sample of 85 deals. Table 19 provides the results of the regression.

**Table 19: Regression results of merger characteristics**

This table reports regression results of merger characteristics such as: (i) control-changing mergers; (ii) completed mergers; (iii) cross-border merges; (iv) intra-industry mergers; (v) transaction values. The dependent variable is CAR in three-day event window. All characteristics except for transaction values, which are independent variables, are represented by dummy variables. Logarithms of transaction values are used as independent variable.

<b>Dependent Variable</b> [-1, +1] CAR	<b>Specifications</b>					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>Control-Changing Merger</b>	7.56 (3.96) *					8.94 (4.30) *
<b>Completed Merger</b>		1.76 (0.63)				-0.61 (-0.22)
<b>Cross-Border Merger</b>			-0.78 (-0.38)			-1.28 (-0.64)
<b>Intra-Industry Merger</b>				-0.34 (-0.16)		-0.75 (-0.38)
<b>LOG (Real Transaction Val.)</b>					-0.16 (-0.36)	-0.71 (-1.64)
<b>Adjusted R<sup>2</sup></b>	15%	-1%	-1%	-1%	-1%	15%
<b>N</b>	85	85	85	85	85	85

\* denotes statistical significance at 1% level

Control-change is a significant characteristic affecting that CAR (Specification 1). A merger causes 7.56% more average CAR in the three-day event window if target-control changes hand. The remaining characteristics prove insignificant. Control-change characteristic preserves its significance and the others remain as insignificant in the multiple regression (see Specification 6).

Final status of mergers proves an insignificant characteristic according to the regression results. However, in completed mergers, target shareholders realize higher CAR than in incomplete mergers as seen in Tables 16 and 17. There is a contradiction between these two deductions. Thus, I run another regression. I use all of 125 deals instead of 85 deals since I already know the final status of each deal. As a result, completed mergers result in 3.58% more CAR than incomplete mergers. The result is significant at 10% level (see Table 20).

**Table 20: Regression results of completed mergers**

This table reports regression results of completed merger variable over the entire sample.

<b>Dependent Variable</b>	<b>Specification</b>
<b>[-1, +1] CAR</b>	
<b>Completed Merger</b>	3.58 <i>(1.84)</i>
<b>Adjusted R<sup>2</sup></b>	2%
<b>N</b>	125

\* denotes statistical significance at 1% level



Finally, I investigate the impact of large merger deals. Instead of taking logarithm of transaction values, I use a dummy variable to classify large mergers. I use three threshold values which are 100 million TL, 500 million TL, and 1 billion TL. According to regressions for each threshold, results are insignificant without any explanatory power again (Table 21). Therefore, large mergers have no impact on CARs during the sample period.

**Table 21: Regression results of large deals**

All independent variables are dummies. Dummy variable takes a value of one if the transaction value is greater than the threshold value.

Dependent Variable [-1, +1] CAR	Specifications		
	1	2	3
> 1 billion TL	0.13 (0.04)		
> 500 million TL		-0.32 (-0.13)	
> 100 million TL			0.01 (0.01)
Adjusted R <sup>2</sup>	-1%	-1%	-1%
N	85	85	85

\* denotes statistical significance at 1% level

#### 5.4 Summary of Empirical Results

I find that Turkish targets earn 4.88% average CAR in the three-day event window. This average CAR increases to 8.56% in control-changing mergers and decreases to 2.25% in non-control-changing mergers. This significant difference indicates that

acquirers pay more for acquiring the control rights in targets. Completed mergers also dominate incomplete mergers in terms of CARs in the three-day event window. Targets earn 6.08% in completed mergers. However, average CAR in incomplete mergers is 2.5% which is not significant at 1%. Investors do not know whether a merger will be completed or not at the announcement date. However, the difference in stronger market reactions to completed mergers and incomplete mergers show that investors may anticipate the final status of mergers. Table 22 summarizes my findings on cumulative abnormal returns in the three-day event window.

**Table 22: Summary of CARs in the period [-1, +1]**

This table shows average CARs in the three-day event window for the entire sample and its subsamples. Number of deals in the entire sample and its subsample are denoted in parentheses.

Full Sample (125)			
4.88% *			
Control-Changing (52)		Non-Control-Changing (73)	
8.56% *		2.25% *	
Completed (42)	Incomplete (10)	Completed (41)	Incomplete (32)
8.93% *	7.05% *	3.16% *	1.08%
Completed (83)	6.08% *		
Incomplete (42)	2.50%		

\* denotes statistical significance at 1% level

## **CHAPTER VI**

### **CONCLUSION**

I investigate the stock-market reactions to mergers of non-financial Turkish target firms. I conduct an event study to measure the short-run impacts of merger announcements. The sample consists of 125 mergers between January 1986 and December 2009. 52 of 125 mergers are control-changing. 83 of 125 mergers are completed.

I find that Turkish targets earn positive CAR in the three-day event window. More precisely, Turkish targets earn 8.56% average CAR in the three-day event window around mergers in which acquirer firms purchase control rights of target firms. This premium is smaller than US and European targets' premiums. US and European target firms earn average premium of 16% (Andrade et al., 2001) and 12.47% (Martynova and Renneboog, 2009), respectively, in the three-day event window around the announcement.

There may be several reasons for this difference. Stock market's reaction to merger announcements may differ from country to country. US targets gain more than European targets. In Europe, UK targets earn more than Continental European

targets. Another possible reason is that announcement date specification is problematic for Turkish firms. Therefore, the possibility of taking wrong announcement dates into account may lower CAR.

I also examine whether completed mergers, cross-border mergers, intra-industry mergers, and transaction value affect CAR in the three-day event window. Completed mergers cause 3.58% more premium than incomplete mergers at a 10% significance level. The remaining characteristics provide insignificant results.

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## **APPENDICES**



## APPENDIX A

### Factiva Search Criteria

I search mergers in Factiva using the form below. I append 17 non-confounding mergers to the sample using Factiva deals after 2006.

<b>Search Form</b>	
<b>At least one of these words</b>	merger acquisition target bidder acquirer takeover
<b>This exact phrase</b>	Istanbul Stock Exchange
<b>Date</b>	from 01/01/1986 to 31/12/2009
<b>Subject</b>	Acquisitions/Mergers/Takeovers

## APPENDIX B

### Merger Sample

#### B.1 Control-Changing Mergers

Target Name	Acquirer Name	Date Announced	Merger Status	Nominal Transaction Val (TL)	Real Transaction Val (2009 TL)
AFM Uluslararası Film	A1 Group Ltd	20.06.2007	Completed	33,698,400	39,197,693
Afyon Cimento	Seeking Buyer	13.03.2000	S Buyer		
Akcimento Ticaret AS	Cimenteries CBR	04.04.1996	Completed		
Anadolu Cam Sanayii AS	Türkiye Sise Cam Fabrikalari	20.08.2003	Completed	65,786,516	114,576,527
Bolu Cimento Sanayii AS	Seeking Buyer	13.03.2000	S Buyer		
Bossa Ticaret ve Sanayi	Akkardan Sanayi ve Ticaret AS	31.07.2008	Completed	88,134,892	96,732,556
Bugun Yayincilik AS	Sabah Yayincilik AS	07.07.1998	Completed	588,662	7,692,317
Canakkale Cimento Sanayii AS	Mortelmaatschappij Eindhoven	17.11.1995	Completed	14,660,000	968,818,511
Celik Halat Ve Tel Sanayi ve	Dogan Sirketler Grubu Hldg AS	08.08.1997	Completed	3,508,000	82,002,464
Cimentas Izmir Cimento	Cementir SpACementir SpA	11.06.2001	Completed	154,000,000	509,376,833
Dogusan Boru Sanayii ve	Seeking Buyer	16.07.2007	S Buyer		
Doktas Docum Sanayi ve Ticaret	Componenta Oyj	18.10.2006	Completed	163,969,200	208,857,781
Eczacıbaşı İlaç	Zentiva N.V.	05.03.2007	Completed	878,922,000	1,101,189,929
EFES Sinaı Yatırım Holdings AS	Coca Cola Icecek Uretim AS	21.10.2005	Completed	196,045,010	283,202,188
Ege Profil	Deceuninck NV	10.04.2001	Completed	5,220,000	20,015,535
Eregli Demir Celik Fabrikalari	Seeking Buyer	12.08.1993	S Buyer		
Gima	Carrefour SA	03.05.2005	Completed	165,000,000	243,914,030
Hektas Ticaret AS	Tam Sigorta AS	14.10.1993	Completed		
Izmir Demir Celik Sanayi AS	Sahin-Koc Celik Sanayi	23.09.2005	Completed	106,374,000	155,232,863
Izocam Ticaret ve Sanayi AS	JV-Isover,Alghanim	06.09.2006	Completed	250,004,869	330,864,979
Kav Danismanlik Pazarlama ve	Koc Holding AS	10.04.2008	Completed	5,060,775	5,756,418
Kent Gıda	Cadbury Schweppes PLC	17.01.2002	Completed	131,417,000	314,837,085

Kipa Kitle Pazarlama Tic	Tesco PLC	27.02.2003	Completed	185,998,000	352,298,400
Klimasan Klima Sanayi ve	Metalfrio Solutions SA	03.10.2007	Completed	55,711,428	61,273,891
Konya Cimento Sanayii AS	Vicat SA	02.07.1991	Completed		
Lafarge Aslan Cimento	OYAK	26.12.2008	Completed	271,818,540	286,494,321
Marshall Boya Ve Vernik	Akzo Nobel NV	19.03.1998	Completed	17,000,000	257,105,512
Meges Boya Sanayi Ve Ticaret	SKW Bauchemie Holding GmbH	17.06.1998	Completed	1,413,000	18,907,464
Migros Turk Ticaret AS	Migros Turk Ticaret AS SPV	21.05.2007	Completed	1,977,365,405	2,300,054,643
Milliyet Gazetecilik	Korkmaz Yigit	07.10.1998	Completed	51,400,000	585,377,454
Netas Telekomunikasyon	Rhea Girişim Sermayesi	30.07.2009	Pending		
Petkim Petrokimya Holding AS	Investor Group	08.02.2007	Completed	2,652,085,000	3,337,050,642
Petrol Ofisi AS	Investor Group	08.12.1997	Withdrawn	290,000,000	5,152,015,690
Petrol Ofisi AS	Investor Group	28.01.2000	Completed	630,000,000	3,720,262,025
Tansas Izmir Buyuksehir	Dogus Grubu Binalari	07.01.1999	Completed	21,333,000	212,570,564
Tansas Izmir Buyuksehir	Migros Turk Ticaret AS	15.08.2005	Completed	579,012,000	852,141,357
Tire Kutsan Oluklu Mukavva	Bomsas Mukavva	01.04.2002	Completed		
Tire Kutsan Oluklu Mukavva	Mondi Packaging Paper Swiece	20.04.2007	Completed	142,154,501	175,163,845
Tofas Oto Ticaret	Tofas Turk Otomobil Fabrikasi	14.06.2000	Completed	45,450,000	229,335,200
Transturk Fren Donanim	AlliedSignal Intl Finance	19.09.1995	Completed	804,762	61,918,216
Turcas Petrolculuk	Turkpetrol International Inc	16.02.1996	Completed	4,295,600	239,840,695
Turk Demir Dokum	Vaillant Saunier Duval Iberica	12.06.2006	Completed	376,450,295	461,762,724
Turk Hava Yollari AO	Seeking Buyer	01.08.1996	S Buyer W		
Turk Hava Yollari AO	Seeking Buyer	13.12.2000	S Buyer		
Turk Siemens	Pirelli & Co SpA	03.08.1998	Completed	5,661,000	71,542,446
Turk Tuborg Bira Ve Malt	Carlsberg Breweries A/S	31.05.2001	Completed	65,000,000	225,961,548
Turk Tuborg Bira Ve Malt	Central Bottling Co Ltd	27.03.2008	Completed	95,704,000	105,869,994
Turkcell Iletisim Hizmetleri	TeliaSonera AB	25.03.2005	Completed	4,210,000,000	6,283,986,305
Turkiye Petrol Rafinerileri AS	Investors	12.08.1993	Intended		
Turkiye Petrol Rafinerileri AS	Investor Group	03.04.2003	Withdrawn	2,180,544,600	3,915,207,942
Turkiye Petrol Rafinerileri AS	Investor Group	13.09.2005	Completed	5,556,000,000	8,107,937,898
Viking Kagit ve Seluloz AS	Investor Group	28.07.2000	Completed	14,750,000	73,909,350

## B.2 Non-Control-Changing Mergers

Target Name	Acquirer Name	Date Announced	Merger Status	Nominal Transaction Val (TL)	Real Transaction Val (2009 TL)
Abana Elektromekanik Sanayii	Ar Holdings AS	23.02.1995	Completed	12,393	1,256,335
Ak-AI Tekstil	Aksu Iplik	19.03.2007	Completed		
Akenerji Elektrik Uretim	CEZ	01.11.2007	Completed	427,694,840	469,416,983
Alcatel Teletas Telekomunikasy	Investors	07.06.1995	Status Unknown		
Alcatel Teletas Telekomunikasy	Seeking Buyer	21.08.2001	S Buyer		
Anadolu Biracilik ve Malt	Efes Pilsen Group	11.05.1998	Completed	12,100,000	62,398,349
Bagfas	Recep Gencer	26.02.2003	Completed	2,775,600	5,257,258
Baticim Anadola Cimento	Orascom Constr Ind SAE	26.01.2006	Completed	72,500,000	101,045,164
Bayrakli Boya ve Vernik	Yasar Holding AS	12.07.2001	Completed	5,571,263	17,873,659
Bolu Cimento Sanayii AS	Dogus SA(Dogus Holding AS)	02.08.1995	Status Unknown	236,980	18,940,872
Bolu Cimento Sanayii AS	Dogus Grubu Binalari	29.06.2001	Completed	7,485,662	24,759,888
Boyner Buyuk Magazacilik AS	CVCI	13.02.2007	Pending	67,478,000	84,905,839
BSH Profilo SA	BSH Bosch und Siemens	26.09.1995	Completed	4,600,000	353,923,016
BSH Profilo SA	BSH Bosch und Siemens	14.07.2003	Completed	105,566,500	183,123,563
Carsi Buyuk Magazacilik	Altinyildiz Holdings AS	08.01.2002	Pending	20,623,880	51,961,042
CBS Printas Oto Boya ve	Michael Huber Munchen GmbH	30.07.1998	Withdrawn	450,000	5,879,298
Ceytas Madencilik Tekstil	Investor	04.06.2001	Completed	23,035	76,192
Ceytas Madencilik Tekstil	Park Elektrik Madencilik	26.12.2008	Completed		
Cukurova Elektrik TAS	Rumeli Elektrik Yatirim AS	11.02.1993	Completed	2,796,000	1,109,177,979
Deva Holding AS	Nutricia International BV	09.05.1995	Status Unknown		
Dogan Gazetecilik AS	Deutsche Bank AG	28.03.2007	Completed	113,300,000	132,840,758
Dogan Yayin Holding	Axel Springer AG	27.11.2008	Status Unknown	198,000,000	211,808,126
Ege Biracilik ve Malt Sanayii	Efes Pilsen Group	11.05.1998	Completed	146,700,000	756,515,517
Ege Profil	Deceuninck NV	12.01.2000	Completed	5,282,000	31,191,149
Egeplast	Ege Yildiz Plastik Pazarlama	07.01.2002	Completed		
Erciyas Biracilik ve Malt	Efes Pilsen Group	11.05.1998	Completed	103,700,000	534,769,319
Eregli Demir Celik Fabrikalari	Ataer Holding AS	04.10.2005	Completed	4,000,000,000	5,778,309,550
Eregli Demir Celik Fabrikalari	Arcelor Mittal NV	13.06.2008	Completed	1,091,000,000	1,202,544,814
Escort Computer Elektronik	Seeking Buyer	28.06.2001	S Buyer		
Grundig Elektronik AS	Arcelik AS	05.12.2008	Completed	130,000,000	137,921,195
Guney Biracilik ve Malt	Efes Pilsen Group	11.05.1998	Completed	29,000,000	149,549,761

Hurriyet Gazetecilik ve	Iktisat Bank	21.06.1993	Completed	112,320	37,415,011
Hurriyet Gazetecilik ve	Investor Group	02.01.1998	Completed		
Ihlas Ev	Seeking Buyer	26.07.2002	S Buyer		
Isiklar Ambalaj	Commercial Bank of Greece SA	28.03.2000	Completed	5,852,976	31,772,799
Kartonsan Karton Sanayi Ve	Park Holding	06.07.2001	Pending	132,845	426,114
Kent Gıda	Cadbury Schweppes PLC	13.12.2005	Completed	127,354,320	175,315,671
Kent Gıda	Cadbury Schweppes PLC	15.05.2009	Completed	26,580,226	28,015,321
Kerevitas Gıda Sanayi ve	Schoeller Holding GmbH & CO KG	08.12.1997	Pending	8,896	158,043
Kerevitas Gıda Sanayi ve	Nestle SA	22.10.2001	Completed		
Konya Cimento Sanayii AS	Seeking Buyer	01.11.1996	S Buyer		
Marmaris Altinyunus	Koc Holding AS	19.10.2001	Pending		
Metas	Rumeli Celik Sanayi AS	06.02.1995	Status Unknown	2,410,000	244,268,753
Otosan Otomobil Sanayii AS	Ford Motor Co	01.11.1996	Pending		
Oysa Cimento Sanayii AS	Haci Omer Sabanci Holding AS	22.03.2007	Pending		
Penguen Gıda Sanayi AS	DEG	16.08.2001	Completed	13,347,530	41,817,759
Petkim Petrokimya Holding AS	Investors	12.08.1993	Status Unknown		
Petrol Ofisi AS	Investors	09.03.1995	Status Unknown		
Petrol Ofisi AS	Undisclosed Acquiror	18.03.2002	Completed	247,500,000	582,454,170
Petrol Ofisi AS	Dogan Sirketler Grubu Hldg AS	12.09.2005	Completed	87,940,138	128,332,105
Petrol Ofisi AS	OMV AG	17.10.2007	Completed	71,195,967	86,833,818
Pinar Entegre ET VE Yem	Investors	24.04.1995	Status Unknown		
Sabah Yayıncılık AS	Investor Group	20.10.2000	Completed	20,377,500	94,819,532
Simko Ticaret ve Sanayi(Sieme)	Siemens AG	14.04.1995	Status Unknown	1,074,048	98,934,775
Tansas Izmir Buyuksehir	Dogus Otomotiv AS	29.06.2001	Completed	11,341,182	37,512,567
Tat Konserve Sanayii A.S.	Templeton Asset Management	17.05.2007	Status Unknown	23,580,000	28,923,779
TAV Havalimanlari Holding AS	Meinl Airports International Limited	12.11.2007	Status Unknown	369,117,000	442,188,162
Tire Kutsan Oluklu Mukaavva	Investor Group	01.12.1997	Completed		
Tofas Turk Otomobil Fabrikasi	Investors	18.08.1993	Completed	7,920,000	2,470,276,363
Tofas Turk Otomobil Fabrikasi	Koc Holding AS	20.01.1995	Completed		
Trakya Cam Sanayii AS	Turkiye Is Bankasi AS	18.12.1998	Pending	2,100	21,608
Turcas Petrolculuk	Burmah Castrol PLC	30.11.1994	Completed	556,300	69,214,009
Turcas Petrolculuk	Tabas Petrolculuk AS	10.06.1999	Pending		
Turcas Petrolculuk	Aksoy Petrol Dagitim	10.06.2005	Completed	34,025,000	49,839,506
Turk Hava Yollari AO	Investors	09.05.1994	Status Unknown		
Turk Hava Yollari AO	Seeking Buyer	11.08.2003	S Buyer		
Turk Tuborg Bira Ve Malt	Carlsberg A/S	06.02.2003	Completed		

Turkcell Iletisim Hizmetleri	Seeking Buyer	12.12.2002	S Buyer		
Turkiye Petrol Rafinerileri AS	Investors	21.01.2000	Completed	729,953,000	4,310,502,264
Turkiye Petrol Rafinerileri AS	Investors	05.10.2001	Pending		
USAS	Seeking Buyer	06.10.2003	S Buyer		
Van Et Ticari Yatirimlar Gida	Seeking Buyer	23.01.2002	S Buyer		
Zorlu Enerji Elektrik Uretimi	Merrill Lynch & Co Inc	22.01.2001	Pending		

## APPENDIX C

### Average Abnormal Returns

#### C.1 ARs in Control-Changing and Incomplete Mergers

This table shows average ARs to target firms in the 61-day event window. Abnormal returns are the difference between realized returns and expected returns. I use OLS market model to compute expected returns. The test statistic is the ratio of average abnormal return on a day to its estimated standard deviation.

Control-Changing and Incomplete 10 Mergers						
Day	AR (%)	<i>t-stat</i>		Day	AR (%)	<i>t-stat</i>
-30	1.12	<i>0.97</i>		1	4.06	<i>3.51 *</i>
-29	0.43	<i>0.37</i>		2	0.38	<i>0.33</i>
-28	1.04	<i>0.90</i>		3	-1.18	<i>-1.02</i>
-27	-0.52	<i>-0.45</i>		4	-2.62	<i>-2.27</i>
-26	-0.21	<i>-0.18</i>		5	1.07	<i>0.93</i>
-25	-1.16	<i>-1.01</i>		6	1.78	<i>1.54</i>
-24	1.07	<i>0.93</i>		7	3.03	<i>2.63 *</i>
-23	1.15	<i>0.99</i>		8	-1.52	<i>-1.32</i>
-22	1.27	<i>1.10</i>		9	-0.78	<i>-0.68</i>
-21	0.41	<i>0.36</i>		10	1.58	<i>1.37</i>
-20	-1.92	<i>-1.66</i>		11	1.13	<i>0.98</i>
-19	-0.60	<i>-0.52</i>		12	-0.26	<i>-0.23</i>
-18	-0.18	<i>-0.15</i>		13	0.50	<i>0.43</i>
-17	-1.48	<i>-1.28</i>		14	2.13	<i>1.84</i>
-16	-2.41	<i>-2.09</i>		15	0.12	<i>0.10</i>
-15	2.64	<i>2.28</i>		16	0.31	<i>0.27</i>
-14	0.02	<i>0.02</i>		17	-0.31	<i>-0.27</i>
-13	-0.37	<i>-0.32</i>		18	0.73	<i>0.63</i>
-12	-0.13	<i>-0.11</i>		19	0.55	<i>0.47</i>
-11	0.80	<i>0.70</i>		20	-0.53	<i>-0.46</i>
-10	0.11	<i>0.10</i>		21	1.24	<i>1.07</i>
-9	-0.07	<i>-0.06</i>		22	1.55	<i>1.34</i>
-8	0.48	<i>0.42</i>		23	1.71	<i>1.48</i>
-7	0.40	<i>0.34</i>		24	-0.65	<i>-0.57</i>
-6	0.35	<i>0.30</i>		25	-0.03	<i>-0.02</i>
-5	1.38	<i>1.20</i>		26	0.15	<i>0.13</i>
-4	-1.24	<i>-1.08</i>		27	-0.16	<i>-0.14</i>
-3	1.12	<i>0.97</i>		28	-0.59	<i>-0.51</i>
-2	-0.52	<i>-0.45</i>		29	0.48	<i>0.41</i>
-1	1.02	<i>0.89</i>		30	0.60	<i>0.52</i>
0	1.97	<i>1.71</i>				

\* denotes statistical significance at 1% level

## C.2 ARs in Non-Control-Changing and Completed Mergers

This table shows average ARs to target firms in the 61-day event window. Abnormal returns are the difference between realized returns and expected returns. I use OLS market model to compute expected returns. The test statistic is the ratio of average abnormal return on a day to its estimated standard deviation.

Non-Control-Changing and Completed 41 Mergers						
Day	AR (%)	<i>t-stat</i>		Day	AR (%)	<i>t-stat</i>
-30	0.68	1.09		1	1.03	1.65
-29	0.58	0.94		2	1.55	2.48
-28	-0.70	-1.13		3	-0.75	-1.20
-27	0.34	0.54		4	-0.80	-1.28
-26	-1.23	-1.97		5	-0.68	-1.09
-25	-1.03	-1.64		6	-0.85	-1.36
-24	-0.42	-0.68		7	0.19	0.31
-23	-0.24	-0.39		8	0.44	0.71
-22	0.15	0.23		9	-0.61	-0.98
-21	-0.54	-0.87		10	1.31	2.11
-20	0.04	0.06		11	-0.19	-0.31
-19	0.06	0.10		12	-0.83	-1.34
-18	0.21	0.34		13	-0.59	-0.95
-17	0.86	1.38		14	0.60	0.97
-16	0.85	1.36		15	0.90	1.44
-15	0.04	0.06		16	-0.36	-0.58
-14	0.04	0.06		17	0.83	1.33
-13	0.21	0.34		18	-0.63	-1.01
-12	0.76	1.22		19	-0.13	-0.21
-11	-0.56	-0.91		20	-0.89	-1.43
-10	-0.65	-1.05		21	-0.67	-1.07
-9	0.27	0.43		22	0.25	0.40
-8	-1.11	-1.77		23	-0.29	-0.46
-7	-0.26	-0.42		24	-1.27	-2.04
-6	0.21	0.34		25	0.04	0.06
-5	1.26	2.02		26	0.16	0.26
-4	1.01	1.62		27	-1.17	-1.87
-3	0.05	0.07		28	-0.33	-0.53
-2	0.25	0.40		29	0.57	0.92
-1	0.20	0.32		30	0.32	0.51
0	1.93	3.10 *				

\* denotes statistical significance at 1% level



### C.3 ARs in Non-Control-Changing and Incomplete Mergers

This table shows average ARs to target firms in the 61-day event window. Abnormal returns are the difference between realized returns and expected returns. I use OLS market model to compute expected returns. The test statistic is the ratio of average abnormal return on a day to its estimated standard deviation.

Non-Control-Changing and Incomplete 32 Mergers						
Day	AR (%)	<i>t-stat</i>		Day	AR (%)	<i>t-stat</i>
-30	1.49	2.09		1	0.41	0.57
-29	-0.81	-1.15		2	0.77	1.08
-28	0.62	0.87		3	-0.45	-0.63
-27	-0.18	-0.25		4	-0.01	-0.01
-26	0.09	0.12		5	-1.24	-1.75
-25	-0.28	-0.40		6	0.57	0.80
-24	-1.14	-1.60		7	-0.35	-0.49
-23	-0.11	-0.15		8	-0.18	-0.26
-22	0.11	0.16		9	-0.02	-0.02
-21	0.94	1.32		10	-0.19	-0.26
-20	-0.75	-1.05		11	-0.90	-1.27
-19	-0.34	-0.47		12	-0.20	-0.28
-18	0.25	0.35		13	-0.30	-0.42
-17	0.62	0.87		14	-1.02	-1.44
-16	-0.54	-0.75		15	1.12	1.57
-15	-0.26	-0.37		16	-0.11	-0.15
-14	-0.53	-0.74		17	0.28	0.40
-13	0.61	0.86		18	-1.24	-1.74
-12	-1.14	-1.60		19	-0.53	-0.75
-11	1.08	1.52		20	0.06	0.08
-10	-0.04	-0.05		21	0.75	1.05
-9	0.19	0.27		22	-0.27	-0.38
-8	-0.87	-1.22		23	-0.89	-1.25
-7	-0.89	-1.26		24	0.35	0.50
-6	-0.65	-0.92		25	0.17	0.24
-5	-0.20	-0.28		26	0.44	0.63
-4	-0.20	-0.28		27	0.02	0.03
-3	0.19	0.27		28	-1.53	-2.15
-2	-0.36	-0.51		29	-0.57	-0.80
-1	-0.15	-0.20		30	-0.21	-0.29
0	0.82	1.15				

\* denotes statistical significance at 1% level

## APPENDIX D

### Average Cumulative Abnormal Returns

#### D.1 CARs in Control-Changing and Incomplete Mergers

This table shows average CARs to target firms in three different event windows. Cumulative abnormal returns are the summation of ARs over multi-day event windows. The test statistic is the ratio of average CAR in the multi-day period to its estimated standard deviation.

<b>Control-Changing and Incomplete 10 Mergers</b>		
<b>Period</b>	<b>CAR (%)</b>	<b><i>t-stat</i></b>
[-1, +1]	7.05	3.53 *
[-3, +3]	6.85	2.24
[-5, +5]	5.44	1.42

\* denotes statistical significance at 1% level

## D.2 CARs in Non-Control-Changing and Completed Mergers

This table shows average CARs to target firms in three different event windows. Cumulative abnormal returns are the summation of ARs over multi-day event windows. The test statistic is the ratio of average CAR in the multi-day period to its estimated standard deviation.

<b>Non-Control-Changing and Completed 41 Mergers</b>		
<b>Period</b>	<b>CAR (%)</b>	<b><i>t-stat</i></b>
[-1, +1]	3.16	2.93 *
[-3, +3]	4.26	2.58 *
[-5, +5]	5.05	2.44

\* denotes statistical significance at 1% level

## D.3 CARs in Non-Control-Changing and Incomplete Mergers

This table shows average CARs to target firms in three different event windows. Cumulative abnormal returns are the summation of ARs over multi-day event windows. The test statistic is the ratio of average CAR in the multi-day period to its estimated standard deviation.

<b>Non-Control-Changing and Incomplete 32 Mergers</b>		
<b>Period</b>	<b>CAR (%)</b>	<b><i>t-stat</i></b>
[-1, +1]	1.08	0.88
[-3, +3]	1.22	0.65
[-5, +5]	-0.43	-0.18

\* denotes statistical significance at 1% level