

DETERMINANTS AND CHARACTERISTICS OF MERGER AND ACQUISITIONS,
AND TARGET FIRM PERFORMANCE: EVIDENCE FROM TURKEY

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AND TARGET FIRM PERFORMANCE: EVIDENCE FROM TURKEY

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Performance: Evidence from Turkey

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Abstract

Mehmet Selim Uçer, “Determinants and Characteristics of Merger and Acquisitions, and Target Firm Performance: Evidence from Turkey”

Mergers and acquisitions (M&A) come in waves, both economy and industry-wide. During these waves, billions worth of assets change hands. Accordingly, a vast empirical literature has sought to uncover the forces leading to mergers. Different research has contributed to literature about drivers of merger waves, but their conclusion can vary according to the time period and countries under study. In Turkey, however such a study explaining the determinants and characteristics of merger waves has been missing despite the fact that there has been 544 M&A activity since 1998. Hence, the objective of this research is to identify the determinants and characteristics of M&A's in Turkey. We found that, Turkish M&A activity is mainly driven by foreign firms' interest to purchase domestic assets. In terms of domestic acquirers, with the ease of positive macroeconomic outlook and increased liquidity, domestic acquirers with high current assets purchased relatively small but high performing, having high return on assets firms in Turkey. On the target firm side, they sold their highly priced shares to foreign and domestic bidders. In line with overvaluation hypothesis and other behavioral theories, stock market index is the main determinant of M&A activity in Turkey. However, presence of liquidity is also important to propagate a wave. It is also found that the Turkish market reacts only to bid price, no other variable related to deal characteristics, and/or firm characteristics, contrary to other country findings in the literature. In addition, stock market reaction to acquisition is weak, even negative following the month of acquisition, which may be a sign for insider trading. Lastly, we prove that target firms can be predicted with high accuracy using firm specific accounting data.

Tez Özeti

Mehmet Selim Uçer, “Determinants and Characteristics Of Merger and Acquisitions, and Target Firm Performance: Evidence from Turkey”

Birleşme ve satın alma dalgaları içinde, milyarlarca varlıklar el değiştirmekte ve buna paralel olarak, satınalmalarının nedenleri ve sonuçlarını ortaya çıkarmaya yönelik geniş bir deneysel literatür bulunmaktadır. Farklı araştırmalar literatüre birleşmelerin sürücüleri hakkında katkıda bulunmakta, ancak bulgular incelenen ülke ve zamana göre değişebilmektedir. Türkiye’de ise 1998 yılından beri 544 birleşme ve satınalma olmasına rağmen, bunların ortaya çıkış sebepleri ve özelliklerini açıklayan bir araştırma bulunmamaktadır. Dolayısıyla, bu araştırma amacı Türkiye’deki birleşme ve satınalmaların ortaya çıkış sebepleri ve özelliklerini belirlemektir. Türk birleşme ve satınalma faaliyetleri çoğunlukla yabancı firmaların yurtiçi varlıkları satın alma ilgilerinden ortaya çıkmaktadır. Yerli satınalanlar açısından olumlu makroekonomik görünüm ve artan likidite, Türkiye’deki daha küçük yüksek performanslı satın alınmasına imkan vermiştir. Hedef firmalarda ise yerli ve yabancı alıcılara değerleri artmış hisselerini satma eğilimi egemen olmuştur. Aşırı değerlendirme hipotezi ve diğer davranışsal birleşme ve satınalma kuramlarına paralel olarak borsa endeksindeki artış Türkiye’deki birleşme ve satınalma aktivitesinin temel belirleyicisi konumundadır. Ancak ekonomide likiditenin mevcudiyeti birleşme ve satınalmaların ortaya çıkması için gereklidir. Bir başka önemli bulgu ise, Türkiye pazarının diğer ülke bulgularının aksine sadece fiyat teklifine tepki verdiği, anlaşma özelliklerinin, satınalma sonucu oluşan borsa fiyatına etkisinin olmamasıdır. Ayrıca satın almalara borsanın verdiği tepki limitli kalmakta, hatta bir ay sonra eksiye dönmektedir. Son olarak, firma özel muhasebe verileri kullanılarak hedef firmaların yüksek hassasiyetle tahmin etmenin mümkün olduğu kanıtlanmıştır.

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CHAPTER 1: INTRODUCTION

Corporations realize M&A's as external growth strategies for various reasons such as synergy, attempts to create market power, taxation, diversification, improved management, growth, portfolio investment, survival, etc. While there are company specific motives for undertaking these external growth strategies, there are also massive economic factors which have caused such a high level of M&A activity. Moreover, M&A transactions have been intensified as the response of globalization, liberalization, increase in competition, regional economic integrations creation, etc. Economic reforms, including privatization of state enterprises undertaken by many countries, have emphasized competition and free markets giving a positive attitude to acquisitions as types of foreign direct investments. All those factors result in an increasing number of potential target firms in the global economy and especially in the undeveloped capital markets.

In 2008 alone, the value of M&A equaled 15% of United Kingdom GDP¹. This percentage was 6% for Turkey. Thus, merger and acquisitions have huge economic importance. Accordingly, a vast empirical literature has sought to uncover the forces leading to mergers. The evidence in finance literature suggests that macroeconomic variables and stock market activity play an important role in determining the timing of mergers (Clarke and Ioannidis, 1996; Gugler, Mueller and Yurtoglu 2004; Alan, 1993). Specifically, merger activity is found to be highly procyclical, slightly leading the business cycle. Other research has documented a relation between merger activity and factors such as economy-wide dispersion in

¹ World Economic Forum, Financial Development Report, 2008

Tobin's q (Jovanovic and Rousseau, 2002) and industrial production (Gort, 1969 and Mitchell and Mulherin, 1996). On the other hand, agency theories basically state that managers take other managers' actions into account when deciding on if and when to merge or acquire.

Different research has contributed to literature about drivers of merger, but their conclusion can vary according to the time period and countries under study. In Turkey, however such a study explaining the determinants and characteristics of merger activities is missing despite the fact that there has been 544 M&A activity since 1998². In such an environment, identification of determinants of an M&A events such as what type of economic and financial circumstances trigger M&A events, or the potential target firm identification becomes the area of great research interest, both to business and academia.

The objective of this research is to identify the determinants and characteristics of merger and acquisition activities in Turkey during period (1998-2008). Six main issues are investigated: 1) Macroeconomic determinants of M&A activity, 2) the characteristics of M&A's in Turkey 3) the factors that discriminate between acquirer and target firms, 4) the differences between target and non-target firms, 5) the determinants of abnormal returns to target firm shareholders 6) prediction of target firms and the M&A events.

The findings of merger characteristics test reveal that Turkey experienced a merger wave in the last four years mainly driven by foreign firms' interest to purchase domestic assets. Foreign acquirers purchased relatively larger in size firms mainly from the same industry. Foreign acquirers also purchased relatively less

² Source Mergermarket

shares than domestic acquirers because of local partner need. In line with the increased private equity or investment type of acquisitions after 2005, the diversified acquisitions and minority shareholding acquisitions increased after 2005.

In terms of domestic acquisitions, with the ease of positive macroeconomic outlook and increased capital market liquidity, domestic acquirers with high current assets purchased relatively smaller in size, high performing and promising Turkish firms with a financing need. On the target firm side, they sold their highly priced shares to foreign and domestic bidders.

The findings of regression analysis of macroeconomic variables on number of M&As further reveal that in line with overvaluation hypothesis and other behavioral theories, stock market index is the main determinant of M&A activity in Turkey. However presence of capital market liquidity is also important to propagate a wave.

Abnormal return regressions showed that the Turkish market only reacts to bid price, and nothing else related to deal characteristics, such as origin of acquirer, purchasing of majority right, medium of payment, whether the deal is diversifying or related acquisition. This is contrary to previous literature that claims all cash bids, related acquisitions, cross-border acquisitions; acquisitions where majority shares are exchanged generate higher abnormal returns. In addition, stock market reaction to an acquisition is weak, even negative following one month of acquisition, which may be a sign for insider trading. Moreover, standard deviations in abnormal returns are very high. This finding is again positive evidence against behavioral theories explaining M&A activity, which claim high pre M&A return for targets, high dispersion in returns and low post-return for target shareholders.

Lastly, we prove that with firm specific accounting data, target firms can be predicted with high accuracy by the use of predictive models such as logistic regression, decision tree and neural networks.

All of the findings throughout the study support the behavioral theories explaining M&A activity: The overvaluation hypothesis, musical chair hypothesis and the managerial discretion hypothesis. The positive economic outlook, the stock-market increase and globalization during the period under study, enabled empire building managers to grow inorganically while target firms used the chance to cash their highly valued shares. The stock market on the other hand, did not react strongly to M&A events and neither to deal characteristics.

This paper is organized as follows. Part II reviews the literature on merger and acquisition determinants, impact on target firm performance and predicting the acquisition event. Part III describes the sample, which includes our data set, data sources and shows the descriptive statistics. Part IV includes our research design, hypotheses, types of analyses, methodologies, variables used in the analyses. Part V discusses the results of the study. Finally, part VI concludes the research.

CHAPTER 2: THEORETICAL BACKGROUND

Mainly five hypotheses have been put forward to explain merger and acquisitions: The first of these is known as the neoclassical industry shocks hypothesis (Mitchell and Mulherin, 1996; Harford, 2004): Some event - economic, regulatory or technological - occurs, like the invention of a new production process or a new regulation that greatly increases the size necessary to obtain minimum average costs in an industry, and this event precipitates a merger wave within the industry. This hypothesis is widely criticized since it fails to explain high correlation between stock market performance and M&A activity in many countries.

Although the industry shock hypothesis lacks in explaining high correlation between stock market increases and increase in number of mergers; Harford (2004), finds an interpretation that incorporates both neoclassical hypothesis and the relationship with stock market activity, namely the overvaluation hypotheses. He claims that the increase in capital liquidity and reduction in financing constraints that is correlated with high asset values must be present for the shock to propagate a wave. He proposes that variables separately measuring capital liquidity and market valuations should be considered and suggests that the observed relation between high stock market valuations and merger activity has been misattributed to behavioral misvaluation factors. The relation is actually driven by the higher capital liquidity that accompanies an economic expansion. Thus, his explanation for increase in mergers is, that they require both an economic motivation for transactions and relatively low transaction costs to generate a large volume of transactions. The influence of the macro-level liquidity factor causes industry mergers to cluster in time even if industry shocks do not. Shleifer and Vishny (1992) make a similar

argument in a study of asset liquidity, where they show that in order for transactions to occur, buyers who intend to employ the asset in its first-best use must be relatively unconstrained. This allows prices offered to be close to fundamental values. They hypothesize that the reason mergers always occur in booms is because increases in cash flows simultaneously increase fundamental values and relax financial constraints, bringing prices closer to fundamental values. Harford (2004) also find evidence against the findings that managers in these industries are taking advantage of temporary mispricing of their industries, but claims, that the capital liquidity that a business expansion provides and an accompanying bull market, allows industry-level mergers to occur.

The second approach, the Q-theory of investment, indicates that a firm's investment rate should rise with its Q (the rate of return on a firm's current capital stock over the firm's cost of capital). A merger involves one company's purchasing the plant and equipment of another company. Mergers are thus forms of investment, and can be explained like other purchases of plant and equipment using the q-theory of investment. Jovanovic and Rousseau (2002), provide evidence in M&A's in favor of q-theory of investment. However, the q-theory is limited in explaining diversified or conglomerate mergers.

Rousseau (2002) proposes that the rise in merger activity during a stock market rally is driven entirely by the general rise in all q's that occur. Moreover, under the q theory, the observed q's are assumed to be unbiased estimates of the firms' true market values. Thus, under the q-theory the mergers occurring during a merger wave should be wealth creating. In contrast, any mergers arising because some companies' shares are overvalued or manager's discretion, is not assumed to

create wealth. Besides under q-theory acquirer must have high income margins in years before a merger, which can be proved or disproved using market data.

The overvaluation hypothesis of mergers is another attempt to explain M&A activity: From time to time, the shares of some companies become overvalued by the stock market. Knowing that their shares are overvalued, the managers of these companies exchange them for real assets through mergers, thereby protecting their shareholders from the wealth loss that will accompany the market's eventual correction of its error in evaluation (Shleifer and Vishny, 2003; Rhodes -Kropf and Viswanathan, 2004; Rhodes-Kropf, Robinson and Viswanathan, 2004).

Shleifer and Vishny (2003) present a theoretical explanation of merger waves that rests on the assumption that share prices become overvalued during stock market booms. The managers of firms with overvalued shares know that they are overvalued and wish to protect their shareholders from the loss in wealth that will come when the market lowers its estimate of the firm's value to its warranted level. They accomplish this by exchanging their overvalued shares for the real assets of another company, which presumably are correctly priced in the market. The target's managers are assumed to have short time horizons, so they too gain by "cashing in" their stakes in their firms at favorable terms. In the Rhodes-Kropf and Viswanathan (2004) version of the overvaluation theory, the motivation of the acquiring firm's managers is the same, but the target's managers are assumed to accept the overvalued shares of bidders, because they overestimate the gains from the merger.

Rhodes-Kropf and Viswanathan (2004) develop a model of rational managerial behavior and uncertainty about sources of misvaluation that also would lead to a correlation between market performance and merger waves. In their model, rational targets, without perfect information, will accept more bids from overvalued

bidders during market valuation peaks because they overestimate synergies during these periods. Their model differs from Shleifer and Vishny's in that target managers rationally accept overvalued equity because of imperfect information about the degree of synergies rather than shorter time horizons.

The fourth approach is the managerial discretion hypothesis of mergers: Some managers are empire builders. Mergers are the fastest way for a firm to grow, and thus empire-building managers undertake mergers even when they may lower the wealth of their shareholders (Marris, 1964; Mueller, 1969).

The willingness of investors to accept new news as good news during a stock market boom changes the costs to managers from announcing unprofitable mergers. The announcement of such a merger under normal conditions would result in a sufficiently large fall in the acquiring firm's share price to prevent its managers from undertaking the merger. The announcement of the same merger during a stock market boom leads to only a modest fall in share price, or perhaps even a rise.

Another approach is musical chairs hypothesis: Toxvaerd, (2003) propose a model that a set of acquirers compete over time for scarce targets. At each point in time, an acquirer can either postpone a takeover attempt, or raid immediately. By postponing the takeover attempt, an acquirer may gain from more favorable future market conditions, but runs the risk of being preempted by rivals.

Gugler, Mueller and Yurtoglu (2004) test the first four of the above hypotheses and they find that the two hypotheses based on shareholder wealth maximization - i.e. the industry shocks hypothesis and the q-theory of mergers - cannot account for mergers' pattern. In contrast, the two hypotheses that do not assume that mergers create wealth, the overvalued shares and managerial discretion/growth maximization hypotheses, are consistent with this pattern. The

number of mergers falling into these two categories increases significantly during stock market booms, thus explaining why they are correlated with stock price movements. Support for these hypotheses is presented by estimating several models of the determinants of mergers. Additional evidence is presented by examining the means of payment and the returns to acquiring firms for up to three years after the acquisitions. Important differences between tender offers and “friendly mergers” are also identified, which add still more support for the two hypotheses.

Among these five hypotheses overvaluation hypothesis, mergers discretion hypothesis and musical chairs hypothesis can be grouped as behavioral hypotheses, because the merger wave is triggered by the common behavior of either managers or investors. On the other hand, industry shock hypothesis and q-theory are more neoclassical approaches since they expect a supply side economic event to trigger waves. The main economic difference is neoclassical merger waves create wealth in the economy whereas behavioral ones do not.

To distinguish between the neoclassical and behavioral explanations, post-merger operating performance can also be used rather than linking pre-merger variables with merger events. Some authors, such as Shleifer and Vishny (2003), claim that the neoclassical hypothesis is lacking because it predicts performance improvements following a merger and the extant evidence on this is mixed at best (see Agrawal and Jaffe, 2003). However, when the neoclassical hypothesis is applied to merger waves; it does not necessarily predict that raw performance will improve following mergers in a wave. Harford (2004) show that the neoclassical hypothesis predicts that performance of the combined firms will be better than it would have been without the merger. However he says that in many circumstances, prior performance is a reasonable proxy for performance without the merger.

Due to the changes the industry is undergoing and the endogeneity of choosing to merge, the contemporaneous performance of the industry also is a problematic proxy. All firms are likely restructuring in some way (either externally or internally) in response to the industry shock, and thus there is no reason to expect that the performance of the merging parties should outperform the benchmark. One could observe a performance decline following a merger, but relative to what would have happened in the absence of the merger, it may be an improvement. Thus, the neoclassical hypothesis predicts that performance will improve relative to the unobservable unmerged performance. Any empirical test of this hypothesis is implicitly testing the joint hypothesis that the empirical benchmark is a good proxy for the unobservable benchmark and that performance improves relative to this benchmark.

In sum, the literature behind behavioral theories expects that cause of merger event is an aggregate overvaluation. Accordingly, behavioral theories expect that pre-wave stock market returns and market to book ratios of target firms are high, dispersion in pre-merger returns are high, post-merger returns are low and post-merger operation performance is low.

On the other hand, neoclassical approach indicates that mergers occur because of macro level economic factors. Neoclassical approach further expects that pre-wave stock market returns and market to book ratios are normal, dispersion in pre-wave returns are normal, post-wave returns are normal, and post-merger operation performance is high or better than without merger.

So different theories have different explanations about the impact of economic factors, capital market liquidity, stock market factors, motives of firms, acquiring firm's characteristics and target firm characteristics on mergers and

acquisitions. Thus the investigation of drivers of M&A's and characteristics of M&A's can also provide evidence related to different theories about merger and acquisitions.

The Evidence on Characteristic and Determinants of M&A Activity

The characteristics and determinants of merger and acquisitions can also vary by country under study. For example, Luypaert and Huyghebaert (2006) empirically investigate the determinants of growth through mergers and acquisitions in a typical Continental European country, Belgium, and their conclusions are not parallel many other country findings. For this purpose, they collected data on 378 Belgian bidders that engaged in 816 M&A transactions during 1997–2005 and matched this sample with firms that did not pursue any external growth. Their conclusions were that they did not find any support for agency problems or hubris underlying M&A activity. Yet, the authors found that ownership concentration significantly negatively affects the external growth decision, consistent with the idea that large owners may care about preserving control and thus avoid issuing stock to pay for their M&A's. This inference is further supported by the high incidence of cash acquisitions in their sample and the lack of significance of stock market prices in explaining M&A decisions in the overall sample. Next, their results do not support the notion that realizing operating synergies by means of scale economies is a key determinant underlying external growth decisions, as the size of incumbent firms is significantly negatively related to the M&A decision. Lastly, they do not find any evidence supporting the financial synergy hypothesis.

Their results further point out that securing market power is a significant consideration in related acquisitions, as they find that such deals are more likely to

take place in highly concentrated industries. The authors also find that aggregate financial market conditions have no large impact on the M&A decision, which is not surprising in a sample where owners care about preserving control. They find some support for the idea that firms are more likely to expand externally when stock prices are down, reflecting that the takeover of an existing company may constitute a bargain. This finding especially contradicts to the observed correlation between stock market performance and number of M&A's. Hence country level studies can produce different results.

Merger characteristics can also affect value created by the merger. First, it has been put forward that the announcements of tender offers and of hostile acquisitions generate higher target returns than the announcement of friendly M&A's. In contrast, bidder returns on the announcement day are significantly lower in hostile bids than in friendly M&A's (Goergen and Renneboog, 2004; Gregory 1997; Franks and Mayer, 1996).

Second, when the bidding management owns large equity stakes, the share price reactions of bidding and target firms may be higher (Healy et al., 1997). This suggests that, when managers do not own equity, the fact that agency problems in the firm are higher is reflected in the discounted share prices. The bidder shareholders may therefore believe that managers with low share participation give priority to growth strategies (including value-destroying mergers), rather than focus on shareholder value maximization.

Third, there is some literature that all-cash bids generate higher target and bidder returns than all-equity acquisitions (Moeller et al 2004; Andrade et al., 2001). The announcement that equity bid is made may signal that the bidding managers believe that their firms' shares are overpriced so that investors adjust the bidders'

share prices downwards. This is in line with the fact that manager's attempt to time equity issues to coincide with surging stock markets or even at the peak of the stock market cycle.

Fourth, corporate diversification strategies can create or destroy value of the target and acquirer firm (Berger and Ofek, 1995). This confirms that companies should not attempt to do what investors can do better themselves, i.e. creating a diversified portfolio. Berger and Ofek (1995) prove that there is a discount in conglomerate prices compared with "pure plays" and the discount increases with diversification. Kruse, Park and Suzuki (2003) on the other hand, find that the long-term performance is significantly greater following diversifying mergers, and there is a remarkable degree of consistency between the pre-merger and post-merger performance. Agrawal, Jaffe, and Mandelker (1992) find that conglomerate (diversified) mergers outperform non-conglomerate (focused) mergers for long-run stock price performance.

Fifth, the acquisition of value-companies leads to higher bidder and target returns. Rau and Vermaelen (1998) show that the acquisition of firms with low market-to-book ratios generates high abnormal returns for the shareholders of the bidding firm whereas the takeover of firms with high market-to-book ratios yields substantial negative abnormal returns. Gordon (2005) finds that acquirer returns are negatively correlated with acquirer size as well as target's size.

Finally, target firms in cross-border acquisitions tend to pocket larger abnormal returns than their counterparts in domestic bids (Danbolt 2004). Thus the literature says that investigating merger characteristics and its relation to abnormal stock market return can also provide valuable insight to value creation in a country.

Overall, the empirical research shows that the shareholders of target firms accumulate significant positive returns in the period around the bid announcement (Martynova and Rennebook, 2006). Bhagat et al. (2005) show that these returns amount to 18-19% over the 1960s, increase to 32-35% over the 1980s, and further augment to 32-45% over the period 1990-2001. They propose that changes in insider trading and takeover regulation introduced in the US in the late 1960s and 1980s may partially account for these differences. These returns can be dissected into those realized prior to the bid announcement, the announcement returns, and those realized after the announcement. Whereas the announcement and post-announcement returns are similar across the acquisition waves, the pre-announcement returns are significantly different.

Target and Acquirer Firm Characteristics, Predicting Deals and the Target Firm

Ones we identify merger characteristics, and determinants of mergers, and the abnormal return determinants, the question is “can we predict a merger or can we predict the target firm?” Over the last decades, much research has concentrated on analyzing M&A activity examining a wide array of firm level factors that are believed to give rise to mergers. Previous studies have not produced a generally agreed list of factors leading to M&A. Simkowitz and Monroe (1971) suggest that target firms tend to be relatively small, have relatively lower P/E and dividend payout ratio and lower equity growth. They further observe that non-financial characteristics appeared to be important. Their multivariate discriminant analysis in-sample results correctly predict 83% of the targets and 72% of the non-targets, while the holdout results are slightly worse predicting 64% of the targets and 61% of the non-target. Stevens (1973) finds that target firms are more liquid and tend to have

lower financial leverage. Huges (1993) summarizes the results of several empirical researches on target firms' pre-merger characteristics. These results suggest that, whilst there are some important variations across time periods and a type of M&A, targets have worse short-term profitability growth records, are smaller, less dynamic and somewhat less highly valued than companies on average.

The paper by Palepu (1986) emphasizes that lower excess return, lower leverage, and smaller size are likely to increase a firm's probability to be acquired, while a liquidity variable, market-to-book ratio and price-earning ratio are statistically insignificant. The predictive ability of the model is tested on a holdout sample made of 30 takeover targets and 1087 non-targets. The magnitudes of the estimated acquisition probabilities are in general small (45%).

Chen, Weinberg, Randy, Yook (1999) apply a standard feedforward backpropagation neural network with a single hidden layer to identify potential takeover targets and the possibility to yield positive abnormal returns from investing in these targets stocks. The variables applied to the neural network models account for size, leverage, liquidity, growth rate, dividend payout, price-earning ratio, and return on equity, Tobin q ratio and industry. An important feature of this study is the adoption of a cost function to account for the different predictive accuracy of the two categories (acquired and unacquired). Overall the results are quite promising. The out-of-sample overall prediction rate is over 70% and the cumulative and daily average return of the portfolios identified by the neural network is significantly higher than the market average return. Harford (1999) finds that firms characterized by higher market-to-book ratio, and cash-rich firms are less likely to be targeted.

Many other studies with the objective of predict takeover targets have the objective of constructing models of takeover likelihood that provide the basis for an

investment or portfolio strategy (Belkaoui, 1978; Palepu, 1986; Barnes, 1999, 2000; Espahbodi and Espahbodi, 2003). Thereby the motivation is to identify targets, which will allow investors to earn abnormal stock market returns by investing in them. These studies normally use the hypothesis of the Market for Corporate Control (MCC) as a theoretical background. The MCC was originally advanced by Manne (1965), and assumes that the takeovers have a disciplinary character. In other words, the takeover mechanism exists to discipline and replace management teams who engage in inefficient behavior (Palepu, 1986; Barnes, 2000; Dickerson et al, 2002).

Methodologies to Predict Merger and Acquisitions

Regarding methodologies used to predict M&A's while several studies have used logit or probit regression analysis to examine the company features that likely make firms takeover targets (e.g., Palepu, 1986; Barnes, 1999; Powell, 2001). At the end of 1990s, certain methodologies such as the profit maximization criterion were suggested by Barnes (1998, 1999, and 2000) Nevertheless; Barnes (1999) concluded that the profit maximization criterion was unable to improve the predictive accuracy of his model. Espahbodi and Espahbodi (2003) compared the ability of four different classification procedures (logit, probit, discriminant and recursive positioning models) in predicting corporate takeovers. Also, this investigation supported Palepu's original pessimistic conclusion in relation to the forecasting power of takeover models.

A wide a variety of methodologies have been applied in an attempt to uncover characteristics common to merger targets, and to forecast merger targets, including univariate analysis (Rege, 1984), MDA (Barnes, 1998), probit / logit analysis (Meador, Church and Rayburn, 1996), and multi-layer perceptions (Neural

Networks) (Cheh, Weinberg and Yook, 1999). The developed classification models have exhibited varying degrees of success ranging from below 50% to around 70% out of sample of the best results were obtained by Powel (1995) who used binomial and multinomial models to predict merger targets. The resulting models produced a classification accuracy of 93%. Most studies seeking to predict likely merger or takeover targets have relied heavily on the use of company accounting data, supplemented by market data such as share price, as modeling inputs.

Most of the prior literature uses around twenty variables, which were identified for initial evaluation and prediction. These variables were from the following ratio categories.

- i. Liquidity
- ii. Financial Leverage
- iii. Profitability
- iv. Valuation
- v. Growth
- vi. Firm size
- vii. Stock Market Performance
- viii. Capital Size

Motives for Merger and Acquisitions

Another important question about merger waves is about the motivational characteristics of merger participants, whether mergers are generated by clustering of efficient asset reallocation or instead by distortional behavior, and ultimately whether mergers create value overall. An alternative explanation is that the merger activity is

driven by distortional behavior, including hubris, herding, or free-cash flow driven acquisitions.

Jensen (1986) and Roll provided (1986) an agency explanation for many mergers. In both cases, mergers destroy value, but under Roll's hubris hypothesis (1986), this is because overconfident managers pursue what they think is the best strategy, and fail, rather than knowingly sacrificing shareholder value for personal gain. Jensen (1986) does only in the sense that he argues that industry shocks that result in overcapacity can lead to value-destroying diversifying acquisitions by self-interested managers. This could create industry-specific merger waves of the kind documented in Mitchell and Mulherin (1996). Herding models in finance (Scharfstein and Stein, 1990; Jensen, 1986) asserts that merger waves can be explained by agency costs of free cash flow combined with a need for exit in an industry. He posits that managers of firms with substantial free cash flow but poor investment opportunities in their own industry will seek expansion and diversification through acquisitions.

Scharfstein and Stein (1990) develop a model of herding by managers making investment decisions. In their model, managers observe a signal about the investment's value. Informed managers observe an informative signal and uninformed managers observe noise. Managers are unsure of whether they are informed or uninformed. Informed managers are receiving correlated signals since they are all informative signals about the same investment. If managers are evaluated relative to their peers, a herding equilibrium obtains in which managers mimic the first mover. In fact, later movers will even ignore their own information in mimicking early movers. In a related model, Graham (1999) shows that while

managers with low ability will herd, managers with high reputation will also herd to protect that reputation.

Merger motives can be summarized into three main categories, as presented in a framework developed by Berkovitch and Narayanan (1993; 347). The authors suggest that there are three major motives for takeover/merger and acquisition activity – efficiency or synergy, agency and hubris. They advocate that these motives exist simultaneously as merger motives within a transaction. Based on empirical evidence, they found that synergy is a primary motive in Merger and Acquisition transactions, based on projected positive economic gains of merging organizations. A more detailed theoretical model of Merger and Acquisition motives is presented by Trautwein (1990). In the model, Trautwein (1990) reviews seven alternative explanations of merger motives- economic efficiency; monopoly theory, empire building; raider; process, and disturbance theory. Trautwein's model is built upon a range of empirical evidence that examines the strength and credibility of each motive.

Since the two of the key explanations are synergies and the correction of managerial failure, typically, takeovers (are expected to) create operating and financial synergies. Operating synergies arise through the realization of economies of scale and scope, the elimination of duplicate activities, diversified integration, the transfer of knowledge or skills by the bidder's management team, and a reduction in agency costs by bringing organization-specific assets under common ownership (Ravenscraft and Scherer, 1989).

The creation of operating synergies reduces production and/or distribution costs, yielding an incremental cash flow accruing to the firm's post-merger shareholders. Operating synergies tend to arise mainly when the merging firms are in

the same or related industries (Comment and Jarrell 1995). Further, operating synergies may include acquisition of technology or intangible assets, such as acquisition of knowledge of new markets in cross-border takeovers.

Diversifying takeovers are expected to benefit from financial synergies. Financial synergies may include improved cash flow stability, lower bankruptcy probability, cheaper access to capital, an internal capital market (Bhide, 1990), and the use of underutilized tax shields.

Domestically-oriented companies frequently resort to cross-border takeovers as a means to survive the tough international competition in global markets. Expansion abroad also enables companies to exploit differences in tax systems and to capture rents resulting from market inefficiencies such as national controls over labor markets (Servaes and Zenner, 1994). In addition, imperfect capital markets allow firms to exploit favorable exchange rate movements by moving operations to other countries or by acquiring foreign firms (Cebenoyan et al., 1992).

CHAPTER 3: DATA COLLECTION AND ANALYSIS

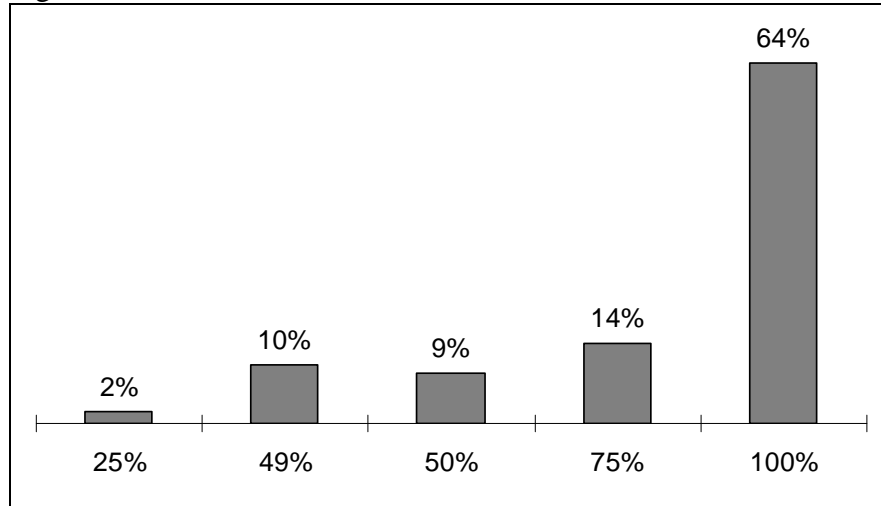
Sample

The main data sources for this study are the databases for Merger and Acquisitions. Empirical data covering the M&A cases in Turkey between 1998 and 2008 is obtained from MergerMarket and MergerStat databases. These two databases are the two primary sources for accurate deal information and widely used both by academicians and investment bankers. However, data for the Turkish M&A deals are very difficult to obtain even from these sources, since databases have incomplete data for Turkey. So, to be able to have a complete data source the two databases are merged and missing information is minimized. After that, interviews with some private equities, investment banks and also with some acquirer firms³ is done to fill some missing deal specific data. Types of data available through these databases include: Announced and completed dates of deals, target, seller, acquirer description their sectors and country of origins, deal values, deal multiples, deal statistics, bid price and bid premia for one day one month before and after, motive of acquirer firm, deal description and deal types (Cross-border / domestic, private/public, merger/acquisition).

Within the scope of this study, we define a merger and acquisition activity as a transaction where more than 10 percent of the target's equity is acquired and where deal value is bigger or equal to 5 million euros. A merger can resemble an acquisition, but mergers by definition result in a new company name and in new branding. There are only three mergers in our sample with respect to this definition.

Figure 1 illustrates the distribution shares transacted in M&A deals between the years under study. In 89% of M&A transactions the acquirer gets the majority share, and in 64% of deals, all shares are transacted in the deal.

Figure 1 Distribution of Percent Share Transacted



As can be seen in Figure 2 on page 24, there are 544 M&A events satisfying our definition of M&A events between 1998-2008 period. Most of the analyses including merger characteristics and macroeconomic determinants of mergers will be based on these 544 observations.

However, for the analyses that require firm specific income statement and balance sheet variables and stock market related analyses our data reduces to 69 for target companies and 61 acquirer companies. The analyses that will use this reduced set of data include investigation of abnormal return determinants; testing hypotheses regarding differences between target and non-target firms, testing hypotheses regarding differences target and acquirer firms and target and year of M&A event prediction tests. All accounting data and stock market price related data is obtained from Istanbul Stock Exchange data distribution service. For the macroeconomic

³ List of firms interviewed is provided in appendix.

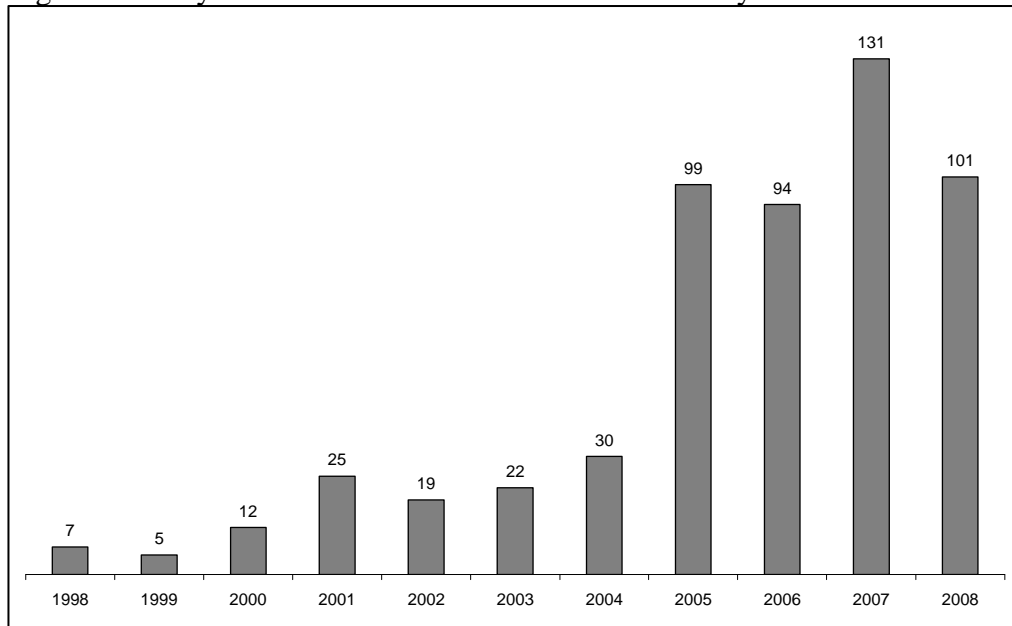
determinants of acquisitions analysis time series macroeconomic data is obtained from central bank of Turkey web site.

Firms engaging in more than one deal might cause dependence problem in firm specific analyses, and performance related analyses; therefore our sample for listed companies reduces to 58 target firms from 69 Targets publicly listed and 42 acquirer firms from 61 publicly listed. This sample size is satisfactory for the analysis purposes. As an example Healy, Palepu, and Ruback (1992) conducted the postmerger performance analysis with 50 cases, whereas this number was 38 in Clark, and Ofek (1994). On the other hand, most of the target prediction related analyses mentioned in the literature review used similar size of data. (Huges, 1993)

Descriptive Analysis of Data

Figure 2 gives the distribution of M&A incidents in Turkey. According to the figure, distribution the M&A activity in Turkey are concentrated between 2005 and 2009. (%79 of M&A's in last decade is completed in the last 4 years). Especially acquisition activity increases after 2004. So, these years can be called a merger wave, in line with theories about that mergers come in waves. For the investigation of differences between deal characteristics in different years end of 2004 will be used as a cut-off. This is because after 2004, a merger wave in Turkey has started and differences between wave years and non-wave years are investigated.

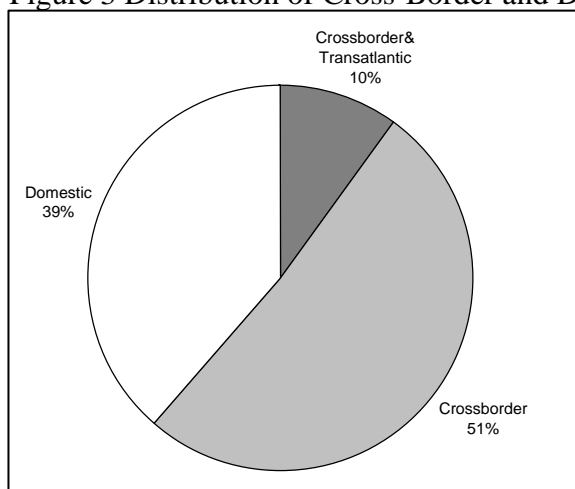
Figure 2 Yearly Breakdown of M&A Activities in Turkey



Cross-Border vs. Domestic Acquisitions and Countries of Origin

There are 336 cross-border (%62) acquisitions. In terms of total value, cross-border M&A's constitute 78% of total transactions. In 269 of cross-border M&A's the bidder company is foreign, on the other hand, there are only 46 cross-border M&A's where the bidder county is Turkey. The bidder is a joint consortium, in 21 of cross-border deals.

Figure 3 Distribution of Cross-Border and Domestic M&A's



Looking at the country of origin of acquirers in Table 1, the interest of foreign capital in acquiring Turkish firms is much more dominant than the interest of Turkish firms to invest abroad. In 46% of transactions foreign bidder acquired a Turkish asset, whereas this number is 5% for the Turkish bidders. Turkish companies mainly focus on acquisition of domestic firms.

As Table 1 presents, in 40% of M&A's, Turkish company bids another domestic company. However this 40% in the table also includes a Turkish firm owned by foreign partners acquiring another Turkish firm, which is 3% in the data. On the other hand, in 41% of M&A's a foreign company bids for a Turkish company. Turkey originated bidders acquisition of foreign firms constitute 5% of data. Another 5% of firms is exchanged between foreign sellers and bidders (in 4% of this the target firms is Turkish but seller is foreign).

Table 1 Distribution of Country of Seller, Bidder and Target Firm

		Bidder			
Seller	Target	Foreign	Turkey & Foreign	Turkey	Grand Total
Foreign	Foreign	0%	0%	0%	0%
	Turkey & Foreign	1%	0%	0%	2%
	Turkey	4%	0%	4%	8%
Foreign Total		5%	0%	5%	10%
Turkey & Foreign	Foreign	1%	0%	0%	1%
	Turkey & Foreign	0%	0%	0%	1%
	Turkey	1%	0%	1%	2%
Turkey & Foreign Total		2%	0%	1%	3%
Turkey	Foreign	1%	0%	1%	2%
	Turkey & Foreign	0%	0%	0%	0%
	Turkey	41%	3%	40%	85%
Turkey Total		42%	4%	40%	87%
Grand Total		50%	4%	46%	100%

Figure 4 Breakdown by Bidder Country

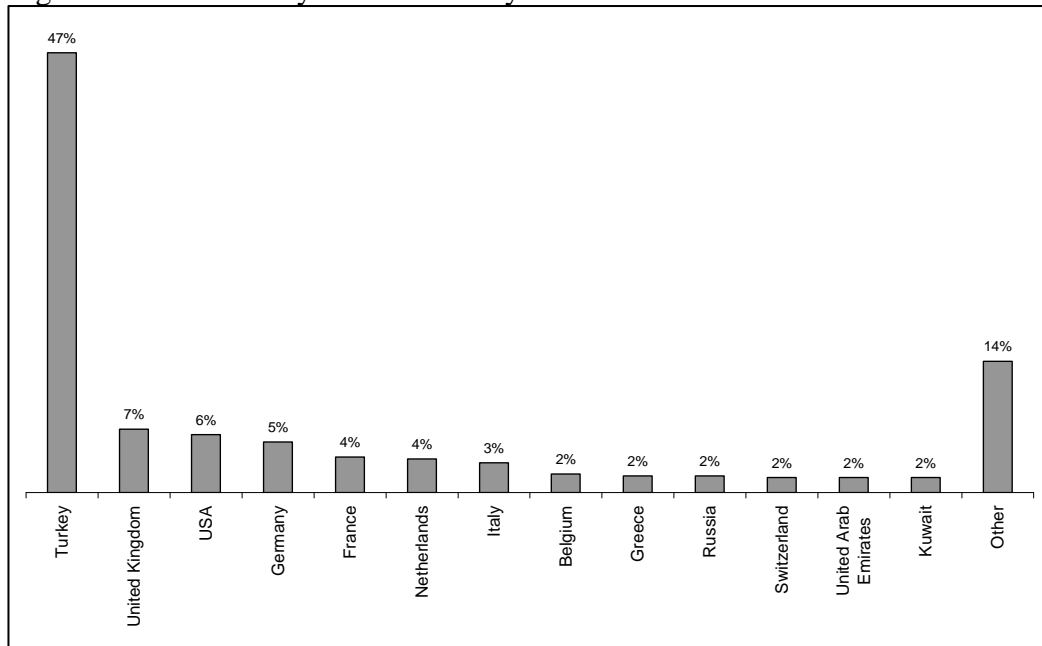


Figure 4 summarizes the distribution of bidder countries. According to the figure UK, USA, Germany and France are the main bidders other than domestic M&A's.

Related vs. Diversified Acquisitions

Sectors of target and acquirer firms are important as being related or diversified merger and acquisitions can create or destroy value according to different theories (Berger, Ofek 1995; Kruse Park Suzuli, 2003). Also investigation of sectors can generate important insight about motives. For example, if acquisitions cluster around highly concentrated industries, this can be a sign for the motive of acquiring firm, namely of securing market power.

Figure 5 presents the industry breakdown of target firms. Consumer goods and financial service firms are the main two target firm industries. These industries are the most concentrated industries together with telecom, therefore we think that securing market power is significant consideration in related acquisitions.

Figure 5 Industry Breakdown of Target Firms

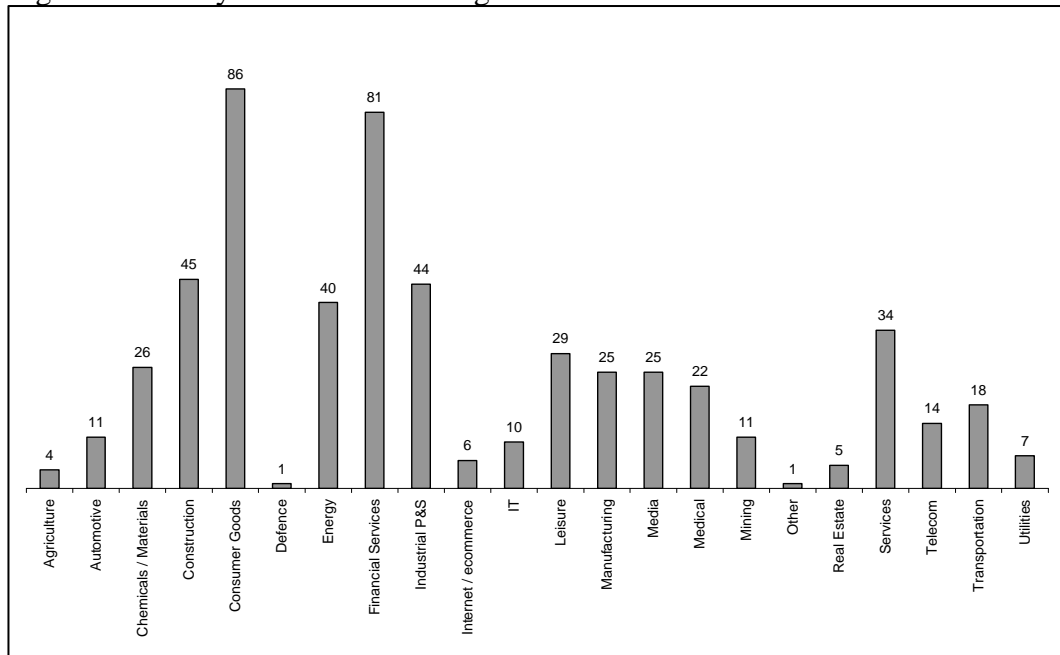
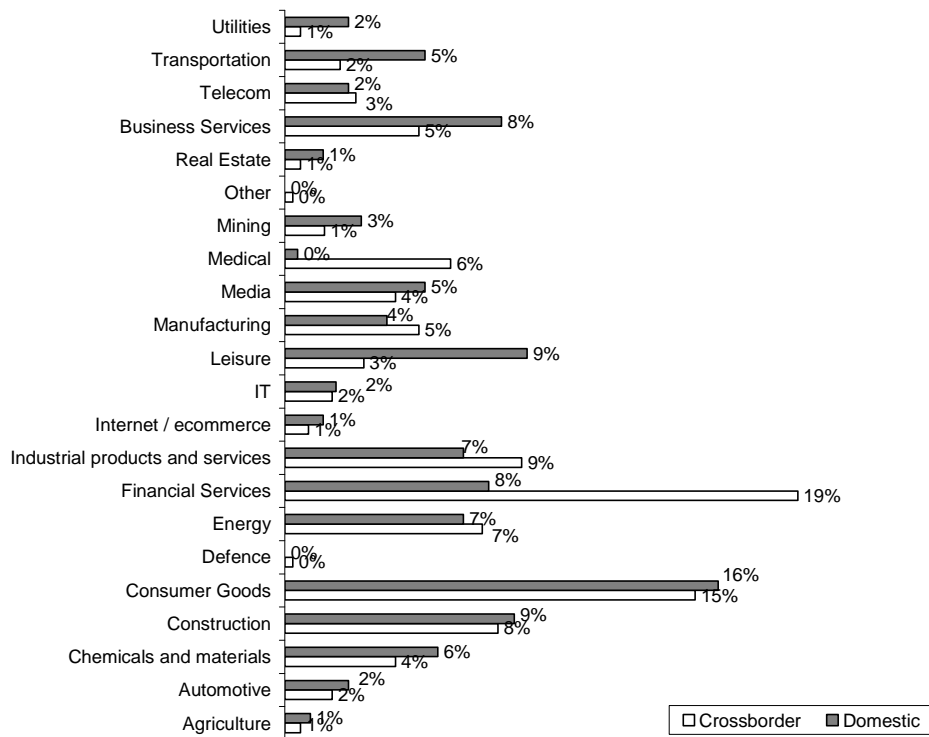


Figure 6 Industry Breakdown of Target Firms in Cross-border and Domestic Acquisitions



The distribution of target firm industry by cross-border and domestic acquisition type is illustrated in Figure 6. Accordingly, cross-border acquisitions are much more

dominant in financial services and medical; whereas domestic acquisitions more focused on leisure and business support services.

Figure 7 Industry Breakdown of Foreign and Turkish Bidders

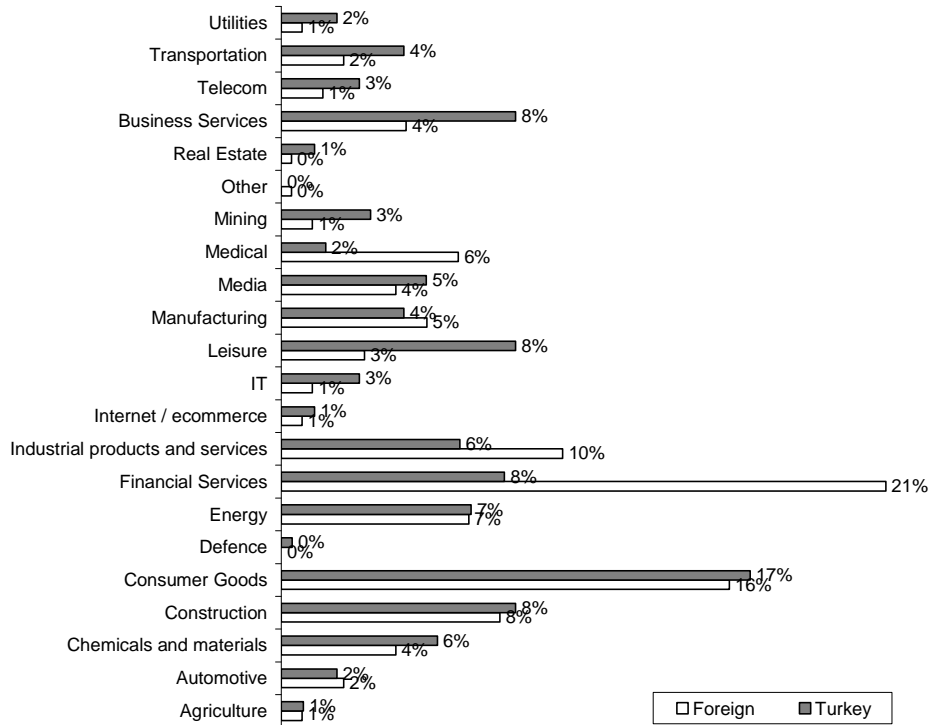


Figure 7 additionally, gives the distribution of target firm industry by foreign and Turkish bidders. According to this figure, foreign bidders are much more dominant in financial services, industrial products and services and medical; whereas domestic acquisitions more focused on leisure and business support services.

Figure 8 Cross Industrial Distribution

		Bidder Sector																				Grand Total			
		Agriculture	Automotive	Chemicals	Construction	Consumer G.	Defence	Energy	Financial	Government	Industrial P&S	Internet	IT	Leisure	Manufacturing	Media	Medical	Mining	Other	Real Estate	Services		Telecom	Transportation	Utilities
Target Sector	Agriculture	2				1		1																	4
	Automotive		8						2												1				11
	Chemicals and materials	1	3	15	1	5		1																	26
	Construction			1	34		1	3	1										3			1	1		45
	Consumer Goods	1		1	2	56		1	17	1	2								3			2			86
	Defence						1																		1
	Energy			4	2			27	2		1								3					1	40
	Financial Services		1		2	1			74										3						81
	Industrial P&S		3	1	1				4		32		2							1					44
	Internet / ecommerce								2			2							1			1			6
	IT				1								5										4		10
	Leisure	1			5				5	1			15						1				1		29
	Manufacturing		2	1	2			1						17					2						25
	Media					1			3	1		1				19									25
	Medical								4								17		1						22
	Mining				2	3								1	1		4								11
	Other														1										1
	Real Estate																			5					5
	Services		1	2	2	3		1	4		2	2			2				1		11		3		34
	Telecom								1			1							3			9			14
Transportation				4				4		1										3		6		18	
Utilities				1			3																3	7	
Grand Total	5	18	27	60	67	1	35	126	4	38	3	10	15	19	22	17	4	22	5	15	17	11	4	545	

Figure 8 presents the sectoral distribution of deals. The industry of target firm is compared to the industry of bidder firm. The numbers in the diagonal represent deals where both target and the bidder are from the same sector. According to the table more than 70% of M&A's are related. The high number of acquisition where the bidder is from financial services and the target another sector (e.g. 17 of targets are from consumer goods) is resulting from private equity and investment house acquisitions of promising firms from different industries.

Deal Specific Values

Table 2 on page 30 summarizes the deal specific variable statistics in the data set. Among 544 M&A observations in the data set we have deal value information for 381 of them. As our sample only consist of deals where deal value is bigger than 5

million €'s the minimum deal value in the data set is five million €'s. Average deal value in the sample is 238 € M, where average implied equity value is 573 € million⁴.

Table 2 Deal Statistics

	Mean	St. Dev.	Kurtosis	Skewness	Range	Min	Max.	Number of Obs.
Percent Share	0.80	0.26	-0.78	-0,84	95.	0.05	1	544
Implied Equity Value (m)	573	1,868	33	5	15,387	5	15,392	339
Enterprise Value (m)	584	1,886	32	5	15,387	5	15,392	339
Revenue	503	1,587	23	5	10,995	3	10,998	136
EBITDA (m)	200	324	5	2	1,376	-37	1,339	32
Earnings (m)	125	235	5	2	1,151	-86	1,066	52
Earnings Per Share	2.2	10.6	32.4	5.7	62.0	-0.7	61.3	33
Revenue Multiple	1.9	1.9	9.5	2.5	12.1	0.1	12.1	82
EBITDA Multiple	24.3	47.8	20.8	4.4	251.2	3.7	254.9	29
Price Equity Multiple	93.0	262.6	18.1	4.3	1,363.8	0.1	1,363.9	42
Bid Premia Share Pr. One Day Before	0.059	0.29	1.71	1.00	1.34	-0.44	0.90	52
Bid Premia Share Pr. One Month Before	0.080	0.28	1.15	0.90	1.30	-0.38	0.91	52
Bid Premia Share Pr. One Day After	0.034	0.26	2.25	1.21	1.17	-0.44	0.73	52
Bid Premia Share Pr. One Month After	0.073	0.27	2.64	0.80	1.33	-0.51	0.82	52
Deal Value USD(m)	284	734	27	5	6,545	5	6,550	381

* All accounting variables of target firms are based on December, 31 data of the year before the deal.

Revenue, EBITDA and Earnings information and their multiples are available for a smaller group of observations in the data, since this type of information is publicly available in limited number of observations. Average revenue is 503 € million,

⁴ Implied equity value equals enterprise value less net debt.

average EBITDA is 200 € million in the sample of 136 observations and their deal multiples⁵ are 24 and 1.9 respectively.

Bid premium⁶ data is available for 52 cases, where targets are publicly traded. Bid premia are positive and relatively high one month before and after (8%), it decreases to 6% one day before the announcement (most probably as a result of insider trading) and becomes 3% one day after the announcement. So stock market reacts positively to an offer price higher than traded share price, and closes the difference starting from one month before the announcement. However, if we look at the bid premium one month after, the bid premium is same as the one month before. So although on average offer prices are higher than traded prices, the stock market reaction to this is temporary with very low bid premium one month after⁷. On the other hand, standard deviations in these bid premia are very high if we compare standard deviations to mean values of bid premia.

Comparing offer price and the traded price before announcement, in 52% of the incidents between 1998-2008 period, the bid price is above the share price per share whereas in 48% of the cases it is lower. This fact is inconsistent with other market observations that in 65-80 % of cases bids price is higher than share price (Martynova and Rennebook, 2006). Excluding the recession or slow economic

⁵ EBITDA and Revenue multiples are calculated by dividing enterprise value derived from deal value by the EBITDA or revenue of the company.

⁶ The Bidder will normally, but not always, offer a higher price per share than the recently traded price, in order to persuade the shareholder to relinquish control. The Bid Premium is expressed as the percentage difference between the offer price and the share price - in other words it is an indication of how much more they are offering the shareholder over the current share price.

⁷ Tender offers for the remaining listed shares over the deal price per share may affect bid premium one month after. In cases where the acquirer gets an exemption from capital markets board not to make an offer, the share price can decrease significantly. The decrease in average share price one month after can be affected by these exemptions.

growth years, 1999-2001 period, does not change this picture. Again, only in 52% of the deals the offer price is higher than the traded price in period 2002-2008. On the other hand, offer price is higher than the stock price one month before in 61% of deals, which can be evidence about higher insider trading in Turkey.

Figure 9 Distribution of Deal Values of Acquisitions in the period 1998 - 2008

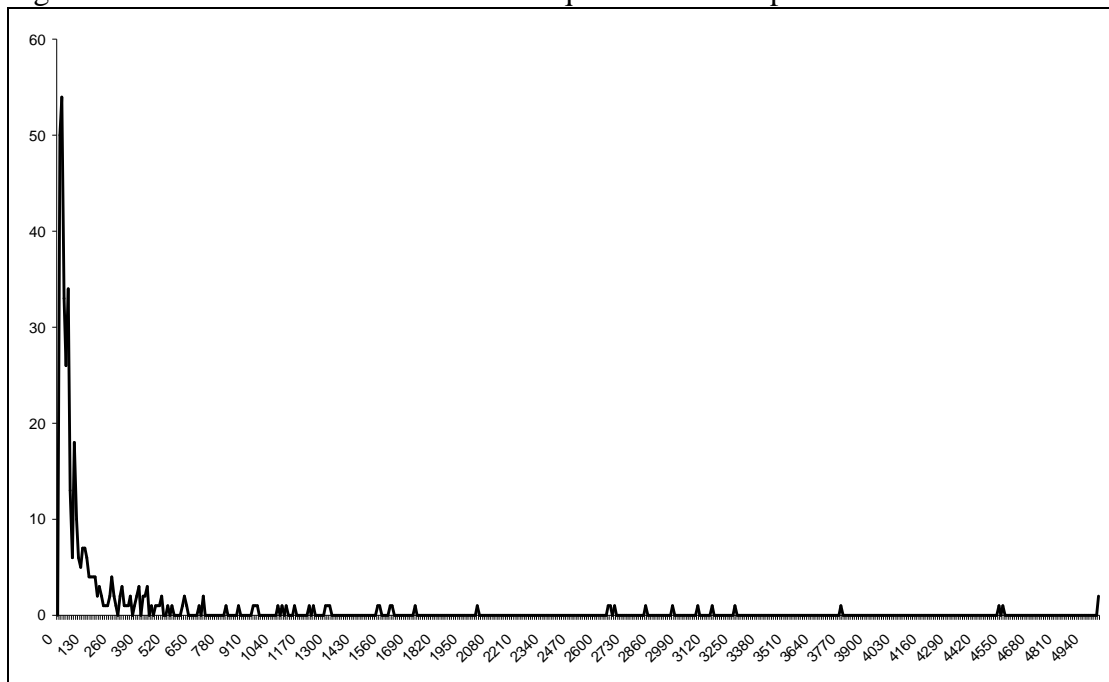


Figure 10 Distribution of Implied Values

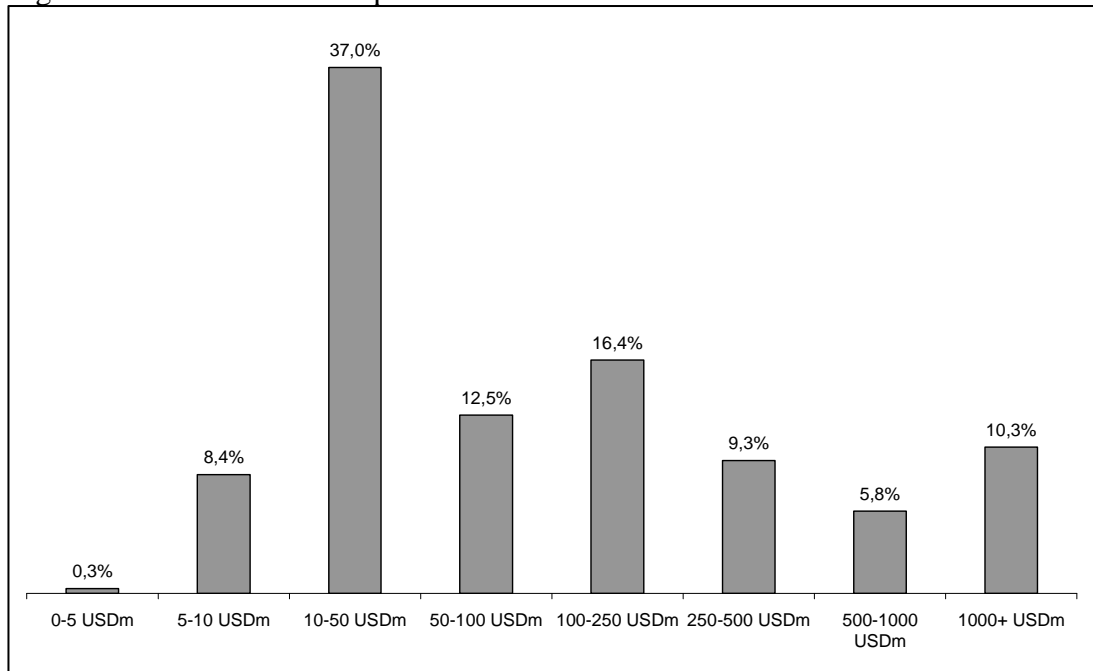


Figure 11 Revenue Multiples across Sectors

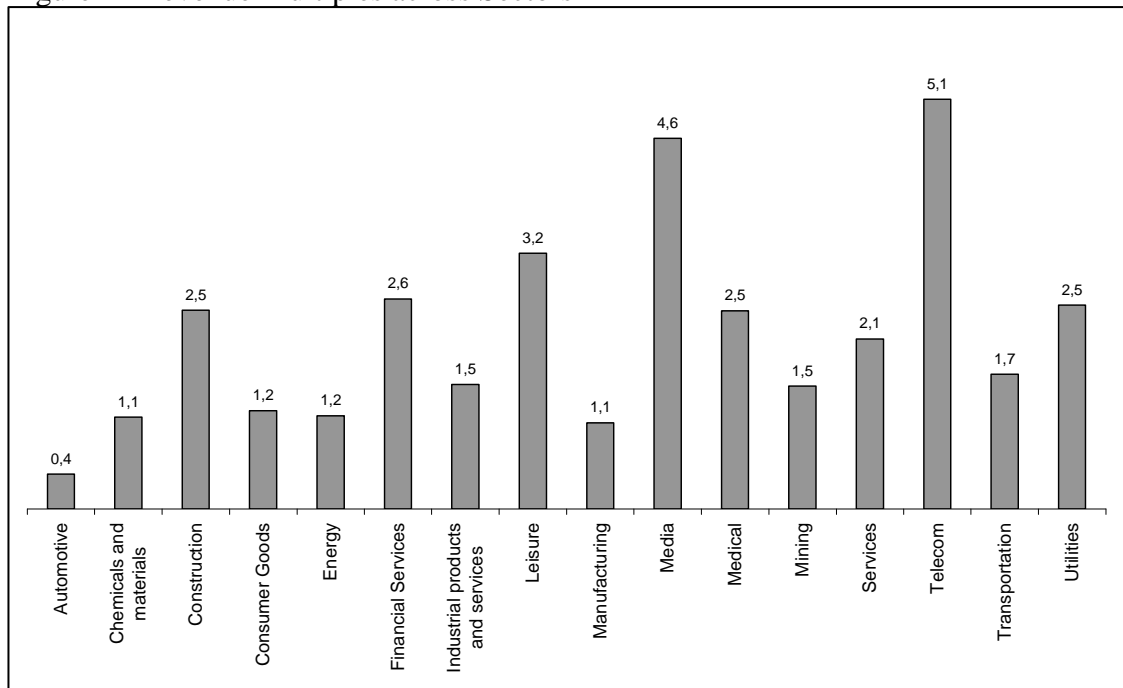
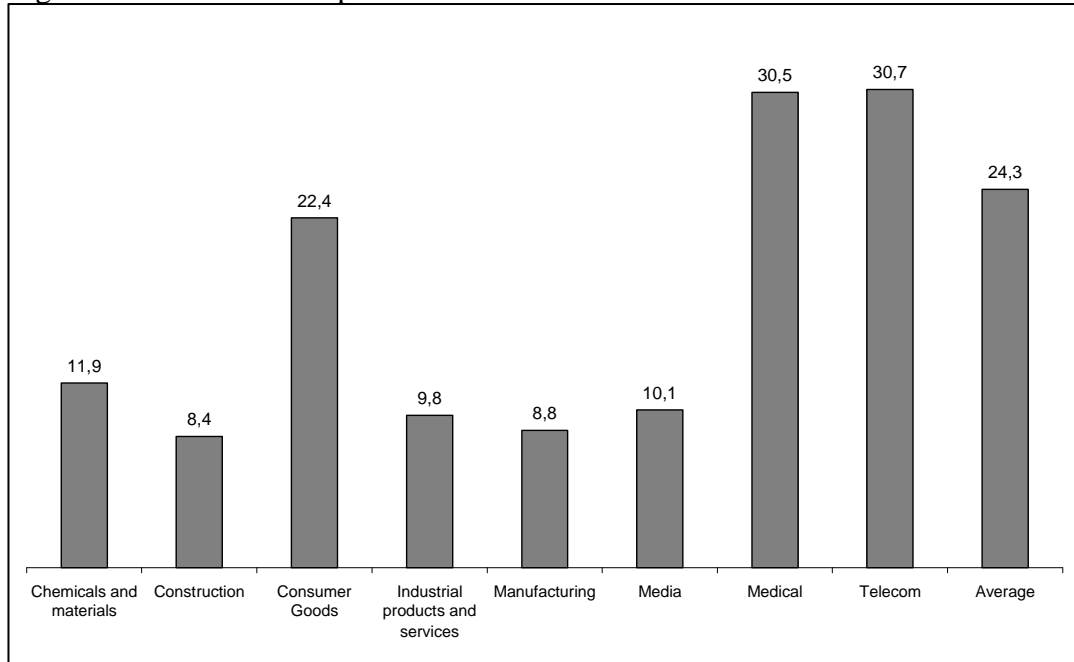


Figure 11 presents the revenue multiples across different industries. Telecom and media have the highest revenue multiples among other industries consistent with other country observations. Telecom and media also have the highest Ebitda multiples among other industries (See Figure 12).

Figure 12 EBITDA Multiples across Sectors



Deal Motives

Motives of merger and acquisitions are analyzed in this study in terms of acquirer firm perspective. Deal descriptions in the Mergerstat database give a complete source of information about the acquirer firm's main intention for acquisition. Based on these, deal descriptions deal motives can be grouped in 13 categories as can be seen in Figure 13 on page 36.

- Foreign New Market Entry: A foreign firm is either looking to enter Turkish or near regions' market or acquires an asset in Turkey to increase their production capacity.
- Horizontal Growth: Bidder firm is acquiring a firm in order to increase market share within the same sector.
- Private equity investment: Includes portfolio investment of foreign and Turkish private equities.

- **New Sector Investment:** Includes acquisitions, where the bidder wants to enter a completely new sector.
- **More Share Purchase:** A firm purchasing more shares in a subsidiary company from other shareholders.
- **Business Expansion:** Includes acquisitions, where the acquirer wants to expand their business by investing a sector that is related to their current sector, mostly complementing the product line.
- **Privatization New Investment:** Includes acquisitions where holdings or other firms want to exploit a privatization as a new investment opportunity. In this category all bidders are from different sectors than the privatized company.
- **Investment:** A firm buying a firm only for investment purposes.
- **Within conglomerate share change:** Swap of shares between to sister companies owned by the same parent company.
- **Strategic Partnership:** Includes acquisitions where two firms join forces to create synergy and pursue a new project or goal.
- **Joint venture:** Includes joint ventures.
- **Management Buy-Out:** Includes management buy-out cases.
- **SDIF:** Include cases where saving deposits insurance fund seize the firm.

Figure 13 presents the motives of bidder companies according to these 13 categories. Accordingly, main motives in Turkish M&A's are; foreign firm entering a new market or purchasing an asset in Turkish market; together with horizontal growth.

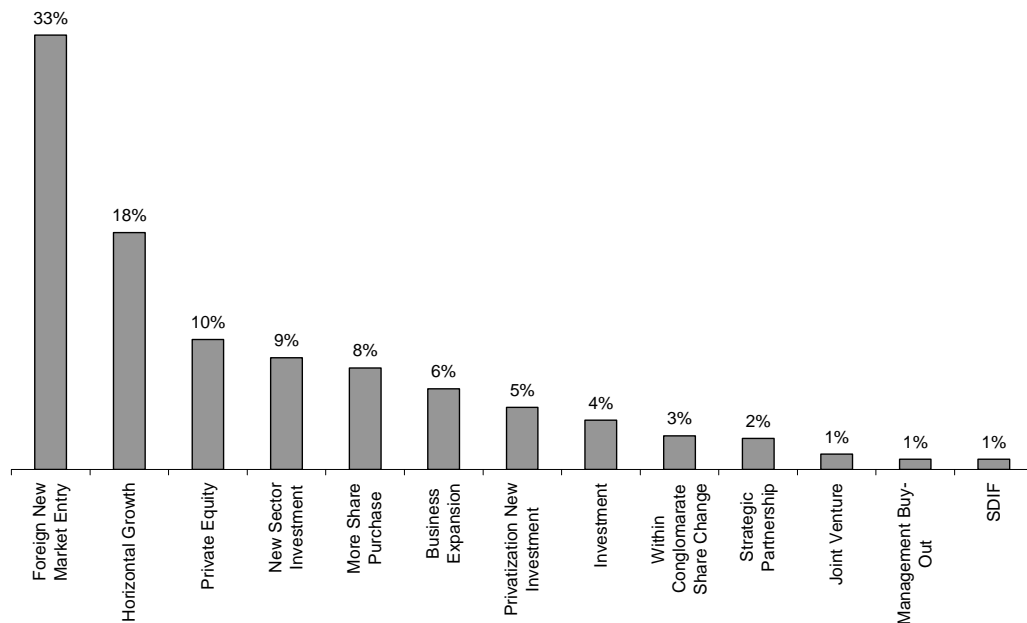
In addition to the fact that horizontal growth is the main motive in 18% of cases, Consumer Goods and Financial Service Firms being the main two target firm

industries in horizontal growth acquisitions, which are the most concentrated industries together with Telecom; so securing market power is significant consideration in related acquisitions.

Private equities and new investment are the other two critical motives. Joint ventures or strategic partnerships have lower percentage compared to other countries. (See Comment and Jarrel 1995)

The fact that 51% of acquisitions are as a result of foreign new market entry motive and horizontal growth indicates that the increase in competitive power is the main motive in Turkey. However there are significant investment related motive driven and diversified acquisitions, which may be as a result of hubris or agency behavior. In order to understand the real motive in-dept study of each case is needed, which is out-of scope of this study.

Figure 13 Acquisition Motives of Bidder Firm



CHAPTER 4: RESEARCH DESIGN & METHODOLOGY

There are mainly six questions that we want to answer within this paper. These are summarized in Table 3.

Table 3 Types of Analyses

Question	Key Variables	Analyses
What are the M&A Characteristics in Turkey and how do they differ according to <ul style="list-style-type: none"> • Cross-border vs. domestic acquisitions? • Related vs. diversified acquisitions? • Years of deal? • Percentage of shares transacted? 	<ul style="list-style-type: none"> • Deal specific values& multiples • Methods of payment • Bid premia and returns • Countries and Sectors • Percent share exchanged 	<ul style="list-style-type: none"> • Analysis of 544 M&A cases with respect to deal characteristics, and values. • Differences between means F-tests
What are the Macroeconomic determinants of the increase in M&A activity?	<ul style="list-style-type: none"> • Interest rate • Stock Market Index • Inflation • Real effective exchange rate • Liquidity • FDI Inflow • GDP growth rate 	<ul style="list-style-type: none"> • Correlate M&A numbers and timing with stock market and economic variables • Multivariate regression
What determines abnormal returns of Target firms?	<ul style="list-style-type: none"> • Method of payment • Cross-border/domestic • Diversified / related • %share transacted • bid premium 	<ul style="list-style-type: none"> • Multivariate Regression: Regress 3 months abnormal return on deal characteristics
Which firms are more likely to be targeted?	<ul style="list-style-type: none"> • Income statement, balance sheet values of firms and stock market values in the acquisition year and one year before 	<ul style="list-style-type: none"> • Discriminant analysis between target firms and out of sample firms • Differences between means F-test
What are the differences between Acquirer firms and Target firms?	<ul style="list-style-type: none"> • Income statement, balance sheet values of firms and stock market values in the acquisition year and one year before 	<ul style="list-style-type: none"> • Discriminant analysis between target firms and acquirer firms • Differences between means F-test
Can we predict M&A's?	<ul style="list-style-type: none"> • Income statement, balance sheet values of firms and stock market values in the acquisition year and prior year. 	<ul style="list-style-type: none"> • Logistic Regression • Decision Tree • Neural Networks

The details of each analysis, hypotheses to be tested, variables and methodology is provided in the next section.

Research Design, Hypotheses and Methodologies

M&A Characteristics

The differences between cross-border and domestic acquisitions have been investigated widely in many researches. Cross-border and domestic acquisitions are defined as follows:

- Cross-border- Domestic: Deals where bidder and target firms are from different countries are classified as cross-border acquisitions. In case of more than one bidder, if one of the bidders is from different country, that deal is also classified as cross-border.

Most of the findings support that cross-border acquisitions yield higher target firm return since they create value through know-how transfer. (Danbold, 2004). On the other hand, it is expected that targets in cross-border acquisitions are bigger in size and therefore deal values in cross-border acquisitions are higher. In addition, since for the bidder firm the value of entering a new market may be higher and since they may value future potential of the firm higher due to the know-how they will bring, the difference between offer price and traded share price can be higher. Lastly, both because of the difference between offer price and traded share price is higher and because of the belief that cross-border acquisitions cluster more on star industries EBITDA multiples of cross-border acquisitions are higher. Hence the hypotheses regarding cross-border and domestic acquisitions are:

Hypothesis 1: Average Deal Values in Cross-border acquisitions are significantly higher than the deal values in domestic acquisitions.

Hypothesis 2: Average implied value and enterprise value of target firms in cross-border acquisitions are significantly higher than domestic acquisitions

Hypothesis 3: Cross-border acquisitions generate significantly higher average bid premium one day before (the percentage difference between the offer price and the closing share price for the day before the announcement) than domestic acquisitions.

Hypothesis 4: Stock market reaction to cross-border acquisitions, namely average abnormal returns⁸ are significantly higher in cross-border acquisitions.

Hypothesis 5: EBITDA multiples of cross-border acquisitions are significantly higher than those in domestic acquisitions.

It is also expected that firms acquiring an asset in a foreign country acquires a firm from the same industry, an acquisition both in a new country and new sector is less expected. In addition it may be expected that the foreign bidder is entering the new market with a local partner, so we may expect that the percent of shared acquired is lower in cross-border acquisitions.

Hypothesis 6: Percentage of related acquisitions is significantly higher in cross-border acquisitions

Hypothesis 7: Average percentage of shares purchased is significantly lower in cross-border acquisitions.

The sectoral dimension of the deals, whether the bidder and the targets are in the same industry or not, and the effects of this is another question. We define diversifying or related acquisitions as follows:

- Diversified – Related: Using the sector data in Mergermarket database for the acquirer and target firm, if the two are from the same industry we classify that

⁸ The difference between target firm share return minus stock market index return over the defined period.

kind of a deal as related, whereas if two firms are in different sectors we classify that deal as diversified.

Theoretically, it is expected that diversified acquisitions generate lower stock market premium due to the diversification discount.

Hypothesis 8: Stock market reactions, average abnormal returns, are significantly higher in related acquisitions are higher than in diversified acquisitions.

We will also investigate the differences in deal specific values between different years. Years between 1998-2004 are characterized as low growth years in the Turkish economy, whereas years between 2005-2008 are high growth years. High future prospects may also affect enterprise values so we expect higher enterprise values for the years after 2004. Higher capital market liquidity in the economy after 2004 may facilitate higher acquisition size; therefore we expect higher average deal values in acquisitions after 2004. We will also investigate the percentage of related acquisitions, but we do not expect any difference in terms of percentage of related / diversified acquisitions between years. Lastly, we expect average percentage of shares purchased is lower in acquisitions after 2004 mainly because deals with investment or private equity participation motive are higher after 2004.

Hence the hypotheses regarding years before 2005 and after 2004 will be:

Hypothesis 9: There is no difference between the percentages of related acquisitions after 2005.

Hypothesis 10: Average deal value of acquisitions after 2004 is significantly higher.

Hypothesis 11: Average enterprise value after 2004 is significantly higher than acquisitions before 2005.

Hypothesis 12: Average percentage of shares transacted is significantly higher in acquisitions before 2005. Similarly, percentage of deals where majority of shares purchased and control rights are acquired⁹ is significantly higher in acquisition before 2005.

We will also investigate bid premia and stock market reaction to acquisitions depending on whether control rights are acquired or not. We define control right ownership as follows:

- **Control Right Ownership:** Deals where more than 50% of shares are acquired by the bidder as a result of the deal is classified as control right, the rest is classified as not having control rights. Here there is an implicit assumption is made that majority shareholding necessarily brings control rights.

In line with market for control rights theory and findings of Healy et al (1997), we expect that bidders pay a premium for the control right, so bid premium per share will be higher for acquisitions, where more than 50% of shares are transacted. On the other hand, we also expect the stock market to value the control right so bid premia are higher in the acquisitions where majority of the target shares are purchased.

Hypothesis 13: Bid premium one day before is significantly higher in acquisitions where more than 50% of shares are transacted.

Hypothesis 14: Stock market reaction, as measured by abnormal returns to target shareholders is significantly higher, when control right is acquired.

⁹ It is assumed that all majority share holders also hold control rights.

Hypothesis 15: Target firms in acquisitions of which more than 50% of shares are purchased, are significantly smaller in size as measured by revenues, average implied equity values and average enterprise values of target firms.

All of the above hypotheses except those that are related with stock market reaction (hypotheses 3,7,12) will be tested using differences between means F-tests. This test is based on the ratio of the variance between the groups and the variance within each group. If the means are the same for all groups, we would expect the F ratio to be close to 1 since both are estimates of the same population variance. The larger this ratio, the greater the variation between groups and the greater than chance that a significant difference exists. We will both use 90% and 95% confidence interval for the tests and report results accordingly.

Variables and Measures:

The following variables will be used to test the above hypotheses:

- EBITDA multiple: Enterprise value of the firm (derived from deal value) divided by EBITDA of the firm in the last fiscal year.
- Deal Value: Total announced deal value in Euros.
- Bid premium one day before: The difference between offer price and closing share price one day before the announcement (Offer price per share minus closing price of one day before the announcement day), divided by closing share price one day before.
- Percentage of shares transacted: Percentage of shares acquired in the deal.

For the hypothesis regarding stock market reaction to different kind of acquisitions (hypothesis 4, hypothesis 8 and hypothesis 14) we will construct an ordinary least squares regression. Deal characteristics such as being domestic or cross-border,

diversified or related will be independent dummy variables and the using the coefficients of these dummy variables we will test the significance of the hypotheses. The details of this analysis are explained in-depth in determinants of abnormal returns section on page 53 below.

Macroeconomic Determinants of M&A's

We expect that number of M&A activity will increase as interest rates decrease, capita market liquidity measured as money supply in the economy increases, stock market index increases, inflation decreases, FDI inflow in the economy increases, and GDP growth rate increases. Previous studies and theories suggest that high liquidity in the market is necessary for M&A's to take place (see Shleifer and Vishny, 1992; Andrade and Stafford, 2001; Clarke and Ioannidis, 1996; Gugler, Mueller and Yurtoglu; Harford, 2004). On the other hand, high performance in stock market is the main indicator and determinant of acquisition activity according to behavioral M&A theories. We do not expect that liquidation and resolving financial distress are the primary motives for the acquisition activity in Turkey therefore a healthy growth macroeconomic environment is also necessary. Hence the hypotheses macroeconomic determinants of M&A's as explained in the following section are:

Hypothesis 16: There is a positive and significant relation between FDI in Turkey and number of M&A activity.

Hypothesis 17: There is a positive and significant relation between Liquidity measured as money supply in Turkey and number of M&A activity.

Hypothesis 18: There no significant relation between real effective exchange rate (overvaluation of domestic currency) and number of M&A activity.

Hypothesis 19: There is negative significant relation between interest rate and number of M&A activity.

Hypothesis 20: There positive significant relation between GDP growth rate and number of M&A activity.

Hypothesis 21: There positive significant relation between stock market index and number of M&A activity.

Hypothesis 22: There no significant relation between rate of inflation and number of M&A activity.

To analyze the relationship between these macroeconomic variables we will look at correlation coefficients and to test the above hypotheses we will construct ordinary least squares regression models. We will construct two models once for the monthly variations in the number of M&A's, second for the quarterly variations. For each of the variables we will use monthly and quarterly data in the period 1998-2008¹⁰. The dependent variable will be number of M&A activity in the period.

Variables and Measures:

The independent variables in the multiple regression are:

- Stock Market Index: Monthly USD based index value of ISE 100 based on closing prices of last trading day.
- Interest Rate: Interbank interest rate
- Exchange Rate: CPI based monthly real effective exchange rate from TCBM (1995=100)

¹⁰ Since GDP growth rate is available only quarterly, this variable will only be used in quarterly regression.

- Inflation: Monthly and quarterly CPI form TUIK (Turkish Statistics Institute).
- GDP Growth Rate: Quarterly growth rate from TUIK.
- Liquidity: We use monetary position published by Central Bank of Turkey as indicator for liquidity in the economy.
- FDI: Domestic direct foreign investment (C9) from balance of payment analytical balance sheet.

For each of the above variables we will use 95% confidence interval for the regression tests.

Determinants of Abnormal Returns to Target Firm Shareholders

The determinants of abnormal returns to target shareholders after the deal announcement can serve as an important evidence for merger and acquisition theories. It is expected that all cash bid should generate higher abnormal return for the target firm. Also since cash payment mean high trust in the economic value added of the target firm we would expect higher abnormal returns in all cash bids. (Moeller et al, 2004; Andrade et al, 2001)

Hypothesis 23: All cash bids generate significantly higher target firm abnormal return.

We also would expect that diversification destroy value both in the target and acquirer company (Berger, Ofek, 1995). In addition related acquisition can both create synergies and also market concentration and hence higher return for the target firm.

Hypothesis 8 (restated): Related acquisitions generate significantly higher abnormal returns to target shareholders than diversified acquisitions.

We also would expect higher return as the percentage of shares transacted increase because of market for corporate control theory. (Healy et al.,1997)

Hypothesis 14(restated): There is a positive significant relation between percentage of shares transacted and abnormal return.

As we also explained in characteristics of acquisitions section, we expect that stock market reaction to cross-border acquisitions to be higher than domestic acquisitions. This evidence is further supported by Danbold, 2004.

Hypothesis 4 (restated): Cross-border acquisitions generate significantly higher abnormal return than domestic acquisitions.

In Turkey, privatization has increased during the last five years. In privatization deals, the exchange of asset from government to the private sector might create extra value and therefore abnormal return. However, since the date of privatization is announced much earlier this premium might be incorporated in the stock price, we do not expect any relation between abnormal return and privatization dummy variable.

Hypothesis 24: There is no significant relation between privatization dummy variable and the abnormal return.

Variables and Measures:

Cumulative abnormal returns are used widely in the literature to measure post-performance. Abnormal returns are calculated as the difference between percentage changes in stock price minus percentage change in stock market index. So for each of the firms one month and three months abnormal return equals:

- One Month Abnormal Return = (Stock price one month after – Stock Price the day before the announcement) – (Stock market index one month after - Stock price the day before the announcement)

- Three Months Abnormal Return = (Stock price three months after – Stock Price the day before the announcement) – (Stock market index three months after - Stock price the day before the announcement)

To test the hypotheses, one month and three month abnormal returns are regressed on:

- Diversified or related dummy variable to measure diversification effect: 1 both target and the acquirer are from the same industry; 0 for else.

- Percent Share transacted: Percentage of shares exchanged in the acquisition deal.

- Offer premium: Offer price per share – traded price in the stock exchange one day before the announcement.

- Cross border / Domestic dummy variable: 1 if the deal is a cross-border acquisition; 0 for else.

- A dummy variable measuring whether the deal is a privatization or not: 1 if the deal is a privatization deal; 0 for else.

- Dummy variable measuring all cash bid or not: 1 if the deal value is paid all cash; 0 for else. Cases where the acquirer financed the bid by borrowing but paid the deal value to total shareholders in cash are also considered as all cash payments. On the other hand, deals where acquirer firms equity or any other asset is used to pay the deal value are not considered as all cash bids. Leveraged buy-outs are also not considered as all cash.

All of these variables are used in previous studies by Agrawal, A. and Jaffe, and Berger, P.G., and E. Ofek 1995. For each of the above variable we will use 95% confidence level for the coefficients significance tests.

Target Firm Characteristics

For the target firm characteristics we will do two types of analyses:

1) Target firm characteristics are compared with a control group of firms that have not been targeted.

2) Firm characteristics prior to the year of acquisition are compared with the firm characteristics in non-acquisition years of the same firms during 2000-2008 period.

So we will identify the differences in target firms both compared to non-target firms and same firms but non-acquisition years.

Nearly in all of the studies related to target firm characteristics in the literature, target firms are found relatively small in size compared to non-target firms (Palepu, 1986; Simkowitz and Monroe, 1971; Huges, 1993). Although other country evidence suggest that targets are less profitable (Huges, 1993), we think that value firms were acquired in Turkey and therefore expect high profitability in target firms.

Overvalued firms will try to cash their overvalued shares and therefore we expect target firms to have higher price to earnings per share (P/E) ratio and market to book (M/B) values both compared to non-target firms and non-acquisition years.

We also expect that target firms are more leveraged than non-target firms because they are larger in size and bigger firms more use credit financing in Turkey. In addition they might want to find financing by selling their shares.

Hence, we test the following hypothesis in Target firm characteristics:

Hypothesis 25: Target firms are significantly smaller in size compared to non-target firms

Hypothesis 26: Target firms have significantly higher profitability compared to non-target firms

Hypothesis 27: Target firms have significantly higher profitability compared to non-target years.

Hypothesis 28: Target firms are significantly less liquid compared to non-target firms.

Hypothesis 29: Target firms are significantly more leveraged compared to non-target firms

Hypothesis 30: Target firms have significantly higher value measured by P/E ratios and M/B ratios ,compared to non-target firms

Hypothesis 31: Target firms are more overvalued measured by P/E ratio compared to non-target years.

Hypothesis 32: Target firms are significantly more profitable and have higher Tobin's q compared to non-target firms.

To test the target firm characteristics, mainly to answer the question of what types of firms get acquired we have 58 Target firm observations in 8 years (2001-2008). For the non-target firms observations we have 1449 observations. This subsample includes all companies listed in stock exchange national market during these 8 years excluding target firms. Using this sample we will compute means of firm specific variables and test the hypotheses using means of difference F-tests. We will both highlight 90% and 95% confidence levels for the variables.

Secondly another sample is formed using 58 Target firms and the non-target years of these same firms. In eight years we will have 274 observations for this

sample (target firms but indifferent years). Using this sample we test the hypotheses that aim to measure the target firm characteristics which are different in acquisition years and non acquisition years.

A stepwise discriminant analysis is carried out to test the differences between acquisition years and non-acquisition years. Discriminant analysis is a statistical technique which allows the researcher to study the differences between two or more groups of objects with respect to several variables simultaneously. It does very well provide that the variables in every group follow a multivariate normal distribution and the covariance matrices for every group are equal.

In the discriminant analysis we will use the dependent variable 1 for 58 target firm observations and 0's: 82 non target firms selected from non-target firms stratified by year and industry. We will select 82 out of 274 non acquisition observations since we need to balance 1's and 0's in the discriminant analysis. To select 82 of non-acquisition years we will select one or two non-acquisition year observation for each acquisition year observation.

Variables and Measures:

The balance sheet and income statement values and their changes prior to acquisition year are analyzed. So if a firm is acquired in 2008, balance sheet and income statement values of 2007 will be used. In order to guarantee that the results do not get affected by inflationary changes and year based differences, USD values for all accounting variables is used.

Table 4 Variables Used in the Analysis

<i>Measure</i>	<i>Indicator</i>
Stock Market Performance	- Stock Market Closing Price
	- Year on Year (YoY) Price Increase
Valuation	- Price / Earnings Ratio
	- Change in Price Earning Ratio (YoY)
	- Market to Book Value of Equity
	- Change in Market to Book Value
Size	- Enterprise Value
	- Book Value of Equity ¹¹
	- Sales (yearly)
	- Total Assets
	- Change in Total Assets (YoY)
Capital Size	- Change in Book Value (YoY)
	- Book Value to Total Assets
	- Change in Book Value to Total Assets
Financial Leverage	- Total Debt
	- Change in Total Debt
	- Total Debt / TA
	- Total Debt / Net Profit
	- Net Debt (Total Debt – Cash)
	- Net Debt / Total Assets
Profitability	- Net Profit
	- Change in Net Profit (YoY)
	- Net Profit / Total Assets
	- Change in Net Profit to Total Assets YoY)
	- EBITDA
	- EBITDA/ Total Assets
	- Tobin's q = EV / TA
Liquidity	- Current Assets
	- Current Assets to Total Assets

Differences between Target and Acquirer Firm

Regarding the differences between target firms and acquirer firms, in line with other country evidence we expect that acquirer firms are bigger in size and more profitable than target firms. In addition, we expect that acquirer firms have more liquid assets as they might be in search of best use of their assets, which may be a reason for engaging in the acquisition deal. Also we expect that target firms are more

¹¹ Total Assets – Intangible Assets and Liabilities

overvalued than acquirer firm, since they might want to cash-out their overvalued shares.

Hence, we test the following hypothesis regarding differences between target firm and acquirer firm characteristics:

Hypothesis 33: Acquirer firms on average are significantly bigger in size compared to target firms

Hypothesis 34: Acquirer firms on average have significantly higher profitability compared to acquirer firms

Hypothesis 35: Target firms on average are significantly less liquid compared to acquirer firms.

Hypothesis 36: Target firms have higher significantly value measured by P/E ratio and M/B ratio compared to acquirer firms.

To test the target and acquirer firm characteristics, mainly to answer the question of what types of differences exist between target and acquirer firms we have 58 Target firm observations in 8 years and 46 Acquirer firm observations in 8 years (2001-2008). We exclude firms engaging in deals as both target and acquirer in different times. So, due to the existence of firms engaging in deals both as acquirer and target at the same year our data reduces to 54 observations for targets and 42 observations for acquirers.

Using this sample we will compute means of firm specific variables and test the hypotheses using means of difference F-tests. We will both highlight 90% and 95% significance levels for the variables.

Secondly, we will do a stepwise discriminant analysis to test the differences between target and acquirer firms. In the discriminant analysis we will use the

dependent variable 1 for 42 acquirer firm observations and 0's for 54 target firm observations.

Variables and Measures:

In this analysis same firms specific variables are used with the analysis of differences between target firms and non-target firms. (See Table 4 on page 51).

Predicting the Acquisition Event and Prediction Model Performance

We test the following two hypotheses in predicting acquisition event and prediction model performance:

Hypothesis 37: We can predict target firms among non-target firms (Out of sample data).

Hypothesis 38: We can not predict the year of acquisition for the target firm.

The acceptance a criterion of prediction hypothesis is to achieve uplift greater than or equal to 2.

Out-of Sample Data Prediction Test

To do the prediction analysis, we have 58 Target firm observations in 8 years. For the non-target firm observations we have 1449 observations. Non-target firm sample includes companies listed in stock exchange national market during 2001-2008 period excluding target firms. There are around 18 Transactions¹² per year among 260 listed firms: This makes a ratio of 7% of acquisition rate in the stock exchange. Since we have 58 acquisition data we will need 754 non-targets out of sample firms selected stratified by year and industry to reach 7% rate. We want to keep this 7% rate in our data, because we want to assess whether we can predict firms being

targeted in a year. Since 7% of firms are being targeted, we use this ratio. Any other ratio may mislead us in while judging prediction accuracy of prediction firms that will be targeted in a year. So, total data makes 812 together with out of sample firms.

To test the prediction performance we separate a hold-out sample. We use 20% for hold-out sample which makes 169 observations. There will be 12 target firms and 157 out-of-sample observations to preserve the 7% rate in the hold-out sample. The rest of the data needs to be balanced to have an accurate model. If we do not balance the data any algorithm may end up with 93% classification accuracy by predicting all incidents as non-target. Therefore we clone 1's in the data 13 times and we reach 598 one's in the data with 597 zero's. Using this total 1195 observation we train and validate the models. After the model is formed we score the hold-out sample and compare predictions with actual results.

Target Firms in Acquisition Years and Non-Acquisitions Years Data

A second prediction test will be done to test whether we can predict the year of acquisition of target firms. We will formulate another sample using 58 Target firms and the non-target years of these same firms in the 2001-2008 period. In eight years we will have 274 observations for this sample (same target firms but non-acquisition years). Using this sample we would test the hypotheses whether we can predict years of being targeted.

To test the prediction performance we separate a hold-out sample. We use 25% for hold-out sample which makes 82 observations. There will be 12 target firms and 70 non-target years of this target firms to preserve the ratio in the overall sample.

¹² 2008 data

The rest of the data needs to be balanced to have an accurate model. Therefore we clone 1's in the data 4 times and we reach 184 one's in the data with 204 zero's. Using this total 388 observation we train and validate the models. After the model is formed we score the hold-out sample and compare predictions with actual results.

The same variables, balance sheet and income statement values and their changes prior to acquisition year, with target and acquirer firm characteristics analyses are used in prediction analyses. (See Table 4 on page 51).

To test the hypotheses about prediction we will use three models, which are widely used for this kind of analysis in the literature:

- 1) Stepwise logistic regression
- 2) C5.0 Decision Tree Algorithm
- 3) Neural Networks

We will use SPSS Clementine as a tool for C5.0 algorithm and SAS for logistic regression and neural networks.

Logistic regression analysis has been used to investigate the relationship between binary or ordinal response probability and explanatory variables. Binary logistic regression, a nonlinear model, is one of the predictions techniques with few assumptions and the dependent variable is a binary or dummy variable. Very few assumptions are required in this model in comparison to other similar dependence techniques such as discriminant analysis. The advantage of this method is that it does not assume multivariate normality and equal covariance matrices as discriminant analysis does.

Decision tree models allow developing classification systems that predict or classify future observations based on a set of decision rules. This approach, sometimes known as rule induction, has several advantages. First, the reasoning

process behind the model is clearly evident when browsing the tree. This is in contrast to other “black box” modeling techniques in which the internal logic can be difficult to work out. Second, the process will automatically include in its rule only the attributes that really matter in making a decision. Attributes that do not contribute to the accuracy of the tree are ignored. This can yield very useful information about the data and can be used to reduce the data to relevant fields only before training another learning technique, such as a neural net. The C5.0 model works by splitting the sample based on the field that provides the maximum information gain at each level.

In C5.0 algorithm we will use boosting, which is a special method for improving its accuracy rate. It works by building multiple models in a sequence. The first model is built in the usual way. Then, a second model is built in such a way that it focuses on the records that were misclassified by the first model. Then a third model is built to focus on the second model's errors, and so on. Finally, cases are classified by applying the whole set of models to them, using a weighted voting procedure to combine the separate predictions into one overall prediction. Boosting can significantly improve the accuracy of a C5.0 model.

We will also do cross validation, which means that C5.0 will use a set of models built on subsets of the training data to estimate the accuracy of a model built on the full dataset. This is useful if dataset is small to split into traditional training and testing sets. The cross-validation models are discarded after the accuracy estimate is calculated. We will also favor accuracy, in some instances; this can lead to overfitting, which can result in poor performance when the model is applied to new data. However since we have a hold-out sample we can control for overfitting.

In Neural networks exhaustive pruning method will be used, which starts with a large network and removes (prunes) the weakest units in the hidden and input layers as training proceeds. This method usually yields better results than other methods. We will also use prevent overtraining option, which randomly splits the data into two separate training and testing sets for purposes of model building.

CHAPTER 5: EMPIRICAL RESULTS

M&A Characteristics

Cross-border vs. Domestic Acquisitions

On the basis of the analytical framework described in the methodology section, the differences between means test results of cross-border and domestic acquisitions are presented in Table 5. Accordingly we can conclude that with 95% confidence

- Average deal values in cross-border acquisitions are higher than the deal values in domestic acquisitions. So hypothesis one is accepted.

- Average percentage of shares transacted in cross-border acquisitions is lower than the domestic acquisitions. Similarly, percentage cross-border deals where majority of the target firm is acquired is less than domestic acquisitions. So, hypothesis 7 is accepted.

- Average implied equity values and enterprise values of target firms of cross-border acquisition are higher. So hypothesis two is accepted.

Also at 90% confidence interval;

- Percentage of related deals is higher in cross-border acquisitions.

Hypothesis 6 is significant at 90% confidence interval.

On the other hand there is no significant difference in bid premium one day before. So the difference between offer price and stock price is not different between domestic and cross border acquisitions, which means the hypothesis three is rejected.

There is also no significant difference in average EBITDA multiples and average revenue multiples between cross-border and domestic acquisitions. Therefore hypothesis five is rejected.

Table 5 Differences between Cross-border and Domestic Acquisitions

Variable	Domestic	Cross-Border ¹³	F-Test	df	P Values
Percent of Shares Transacted**	0.873 0.22 0.015	0.766 0.269 0.015	23.38	1, 542	0.00
Related Sector*	0.62 0.487 0.034	0.693 0.462 0.025	3.103	1, 542	0.071
Implied Equity Value (m)**	203.638 658.543 55.07	846.3 2363.702 169.268	9.995	1, 336	0.002
Enterprise Value (m)**	208.276 698.435 58.406	860.74 2378.779 170.348	10.112	1, 336	0.002
Revenue Multiple	2.241 1.971 0.43	1.827 1.912 0.245	0.72	1, 80	0.39
EBITDA Multiple	8.697 5.158 1.824	30.214 55.222 12.05	1.184	1, 27	0.286
Bid Premia Share Price One Day Before	0.08 0.367 0.13	0.053 0.271 0.052	0.051	1, 33	0.822
Bid Premia Share Price One Month Before	0.064 0.299 0.106	0.085 0.279 0.054	0.036	1, 33	0.851
Majority of Target Acquired**	0.88 0.326 0.023	0.744 0.437 0.024	14.926	1, 542	0.00
Deal Value USD(m)**	169.006 420.332 33.654	363.418 881.46 58.764	6.552	1, 379	0.011

* Significant at 90% confidence level

** Significant at 95% confidence level

In cross-border acquisitions, the targets are bigger in size (higher enterprise value and deal value) relative to those in domestic M&A's. In addition, percentage of related acquisitions is lower compared to domestic acquisitions which may mean bidder firms acquire assets from the same sector in cross-border deals. Entering a new market and country at the same time is much more riskier and therefore less

¹³ Cells contain mean, standard deviation, standard error

common in the sample. Also cross-border bidders purchase less share compared to domestic bidders, because they need the presence of the local partner. Moreover, there is no difference in terms of difference between offer price compared to share price so we conclude that cross-border bidders do not pay an extra premium compared to domestic bidders. In line with this EBITDA multiples and Revenue multiples are not statistically different in domestic and cross-border acquisitions.

Year Based Differences

Table 6 presents the differences between means test for acquisitions before January 2005 and after January 2005. The year 2005 is selected as a cut-off point because number of M&A's in Turkey significantly increases after 2004. Accordingly;

- Percentage of related acquisitions is higher in acquisitions before 2005 at 90% confidence level. Therefore hypothesis 9 is rejected.
- There is no statistical difference between average deal values between acquisitions before and after 2004. Hypothesis 10 is rejected.
- Average implied values and enterprise values of acquisitions after 2004 are higher at 90% confidence level. Hypothesis 11 is accepted.

Average percentage of shares transacted is significantly higher in acquisitions before 2005 at 95% confidence level. Similarly, percentage of deals where majority of shares purchased and control rights are acquired is significantly higher in acquisition before 2005. Therefore hypothesis 12 is accepted.

The fact that there is no difference between deal values but enterprise values are higher, is a result of lower percentage of shares is purchased in deals after 2005. Similar average deal values are paid for lower percentage of shares and therefore average enterprise values are higher.

The finding that after 2004 acquirers buy lower percentage of shares and after 2004 percentage of diversified acquisitions increase is an evidence for increased private equity or investment type of acquisitions after 2004. This evidence further supports behavioral theories (managerial discretion, overvaluation hypothesis and musical chairs hypothesis) that expect more diversified bids in merger waves.

Table 6 Differences between Acquisition Before 2005 and after 2004

Variable	After 2005	Before 2005 ¹⁴	F-Test	df	Importance
Percent of Shares Transacted**	0.776 0.265 0.013 424	0.917 0.187 0.017 120	29.474	1, 542	0.000
Related Sectors*	0.646 0.479 0.023 424	0.733 0.444 0.041 120	3.195	1, 542	0.074
Implied Equity Value (m)*	648.772 2017.324 119.079 287	155.903 320.203 44.837 51	3.024	1, 336	0.083
Enterprise Value (m)*	658.986 2036.577 120.215 287	166.641 329.628 46.157 51	2.96	1, 336	0.086
Majority of Target Acquired**	0.764 0.425 0.021 424	0.908 0.29 0.026 120	12.196	1, 542	0.0001
Deal Value USD(m)	310.361 795.177 46.219 296	191.376 455.701 49.428 85	1.737	1, 379	0.188 Unimportant

* Significant at 90% confidence level

** Significant at 95% confidence level

¹⁴ Cells contain mean, standard deviation, standard error, number of observations

Deal Characteristics and Percentage of Shares Transacted

Table 7 presents the differences between means test for acquisitions where majority shares purchased and minority shares purchased. Accordingly;

- There is no statistical significance between average bid premium between two groups. The hypothesis 13, that there are higher bid premium for acquisitions where control rights are purchased, is rejected.

- Average implied equity values, average enterprise values and average revenue of target firms, whose minority shares are purchased, are higher than target firms whose control rights are purchased. So target firms, whose minority shares are purchased, are bigger in size. Therefore we accept hypothesis 15.

- There is no statistical significance between average deal values of these two groups at 90% confidence interval.

Table 7 Differences in Deal Characteristics for Acquisitions Where Majority Shares of the Target is Purchased versus Minority Shares Purchased

Variable	Minority of Target	Majority of Target ¹⁵	F-Test	df	P-Values
Implied Equity Value (m)**	1258.942 3092.861 347.974	365.607 1221.749 75.916	14.349	1, 336	0.000
Enterprise Value (m)	1289.953 3145.4 353.885	369.581 1212.309 75.329	14.971	1, 336	0.000
Yearly Revenue**	1188.106 2249.115 397.591	292.815 1260.214 123.574	8.203	1, 134	0.005
EBITDA (m)**	370.526 430.26 124.205	98.384 187.555 41.938	6.161	1, 30	0.019
Bid Premia Share Price One Day Before	0.043 0.33 0.104	0.066 0.28 0.056	0.045	1, 33	0.833
Bid Premia Share Price One Month Before	0.058 0.225 0.071	0.089 0.302 0.06	0.088	1, 33	0.769
Deal Value USD(m)	340.976 678.609 74.042	267.65 749.627 43.498	0.652	1, 379	0.42

* Significant at 90% confidence level

** Significant at 95% confidence level

The analysis of control rights show that there is no extra premium paid for control rights. The only difference is that firms where control right is acquired are smaller than firms whose minority shares are acquired.

Macroeconomic Determinants of M&A's

Table 8 presents correlation coefficients between macroeconomic variables and number of M&A activity. Accordingly, there is positive correlation between FDI inflow in Turkey and M&A activity. Similarly, real effective exchange rate, stock

¹⁵ Cells contain mean, standard deviation, standard error

price index, GDP growth rate and liquidity have positive correlation with number of M&A's.

On the other hand, inflation rate and interest rate have negative correlation with number of M&A activity. Stock price index and real effective exchange rate have the highest correlation coefficients with number of M&A's among all variables.

Table 8 Correlations with Number of M&A's and Macroeconomic Variables

Variable	Correlation Coefficient with Number of M&A's
Inflation	-0,52
FDI	0,54
Liquidity	0,2
Real Effective Exchange Rate	0,76
Interest rate	-0,63
GDP Growth Rate	0,21
Stock Price Index	USD: 0,75 In YTL 0,85

Figure 14 to Figure 20 illustrates the time series behavior of these macroeconomic variables and the M&A activity. Strong correlation of between the variables can also be seen from these figures.

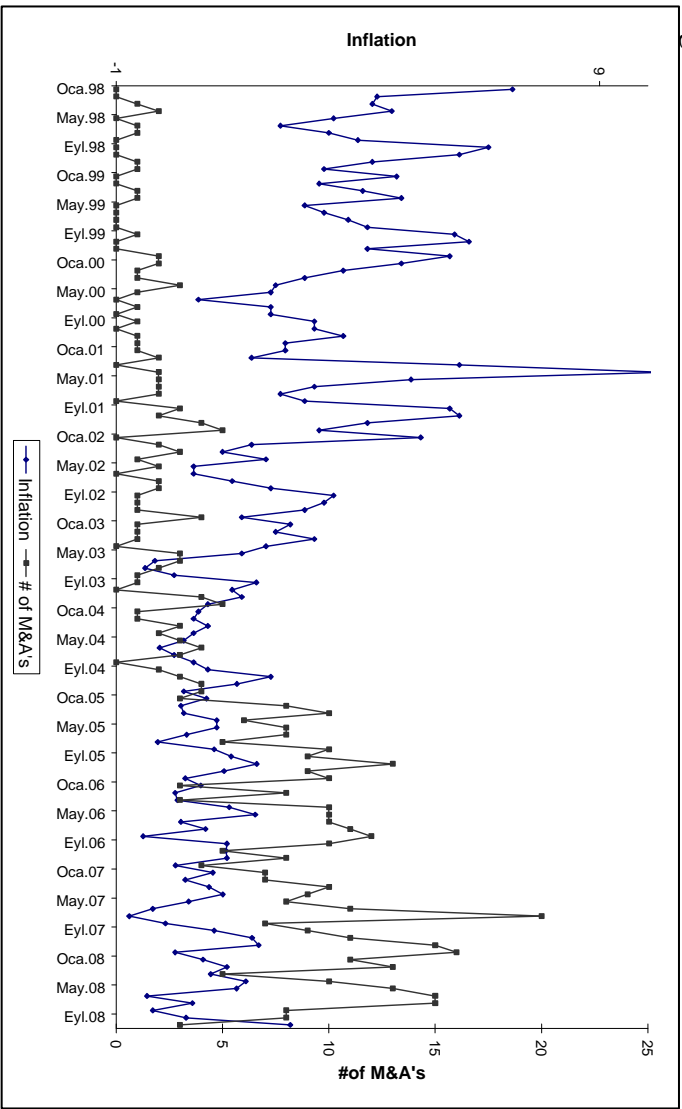


Figure 14 Inflation vs. Number of M&A's

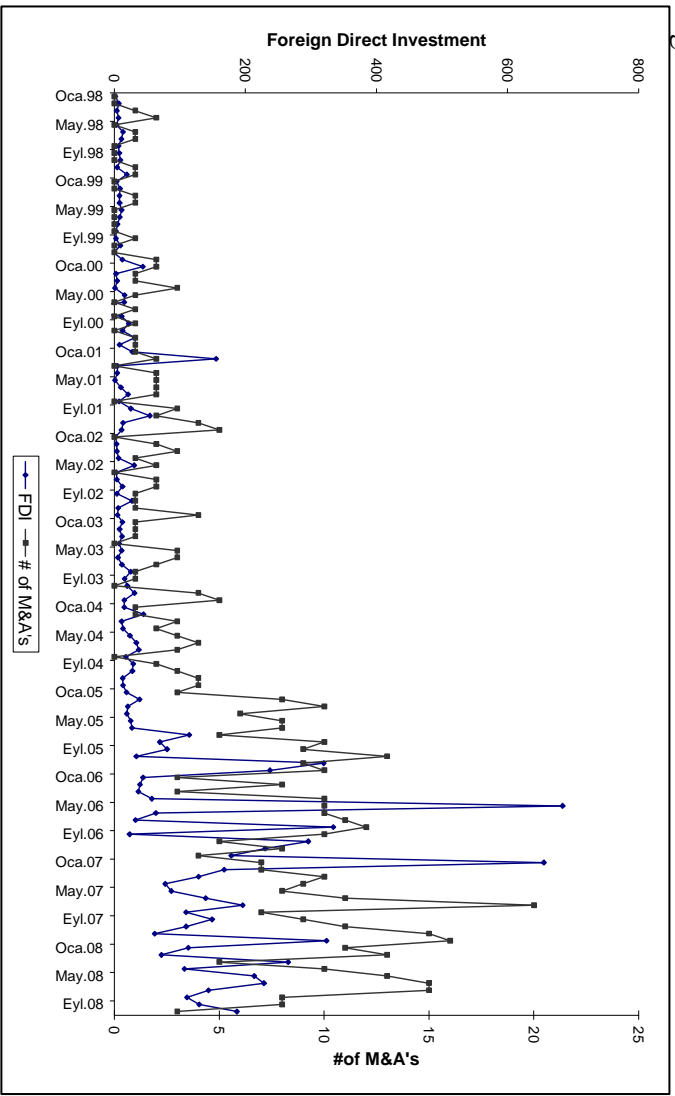


Figure 15 FDI vs. Number of M&A's

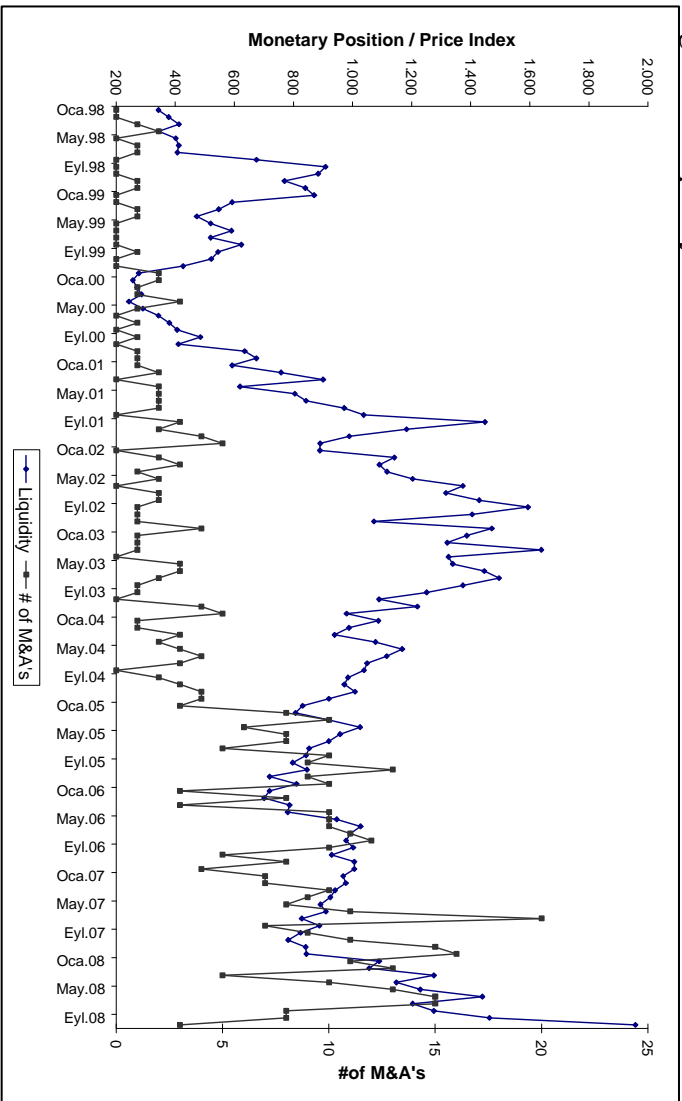


Figure 16 Liquidity vs. Number of M&A's

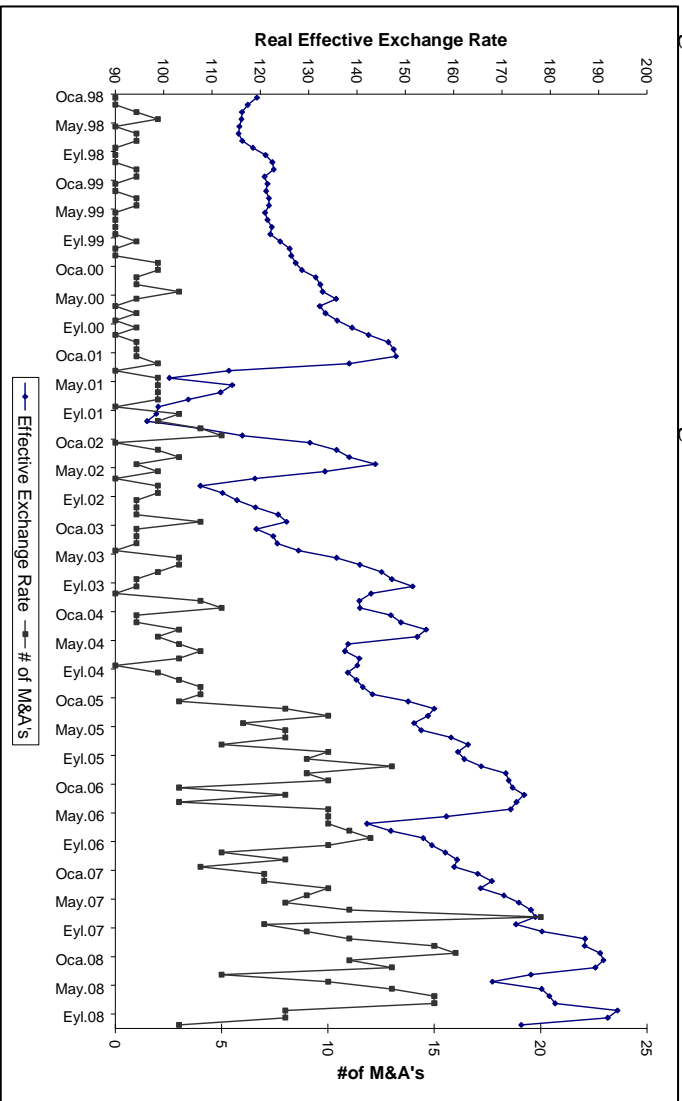


Figure 17 Real Effective Exchange Rate vs. Number of M&A's

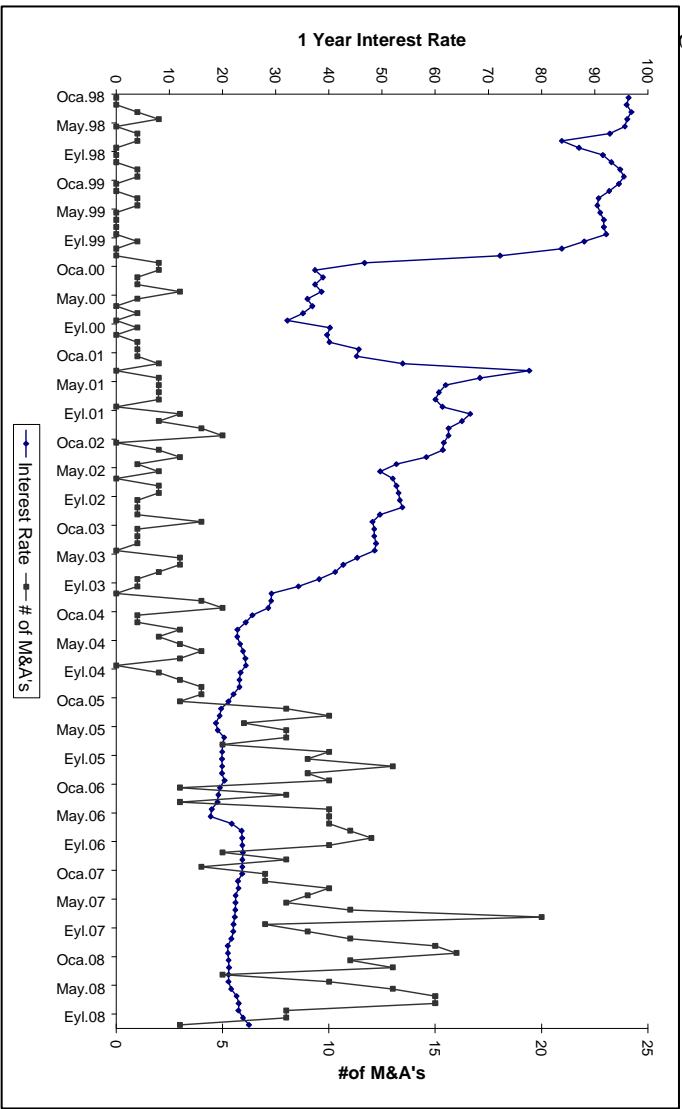


Figure 18 Interest Rate vs. Number of M&A's

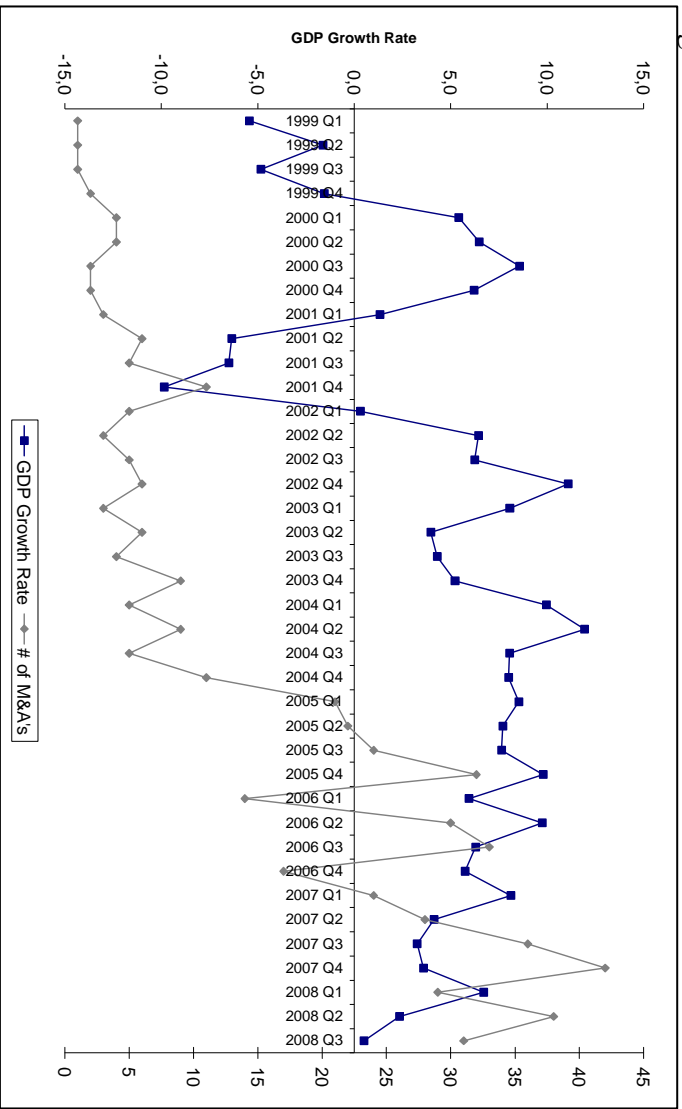


Figure 19 GDP Growth Rate vs. Number of M&A's

Figure 20 GDP Stock Market Index vs. Number of M&A's

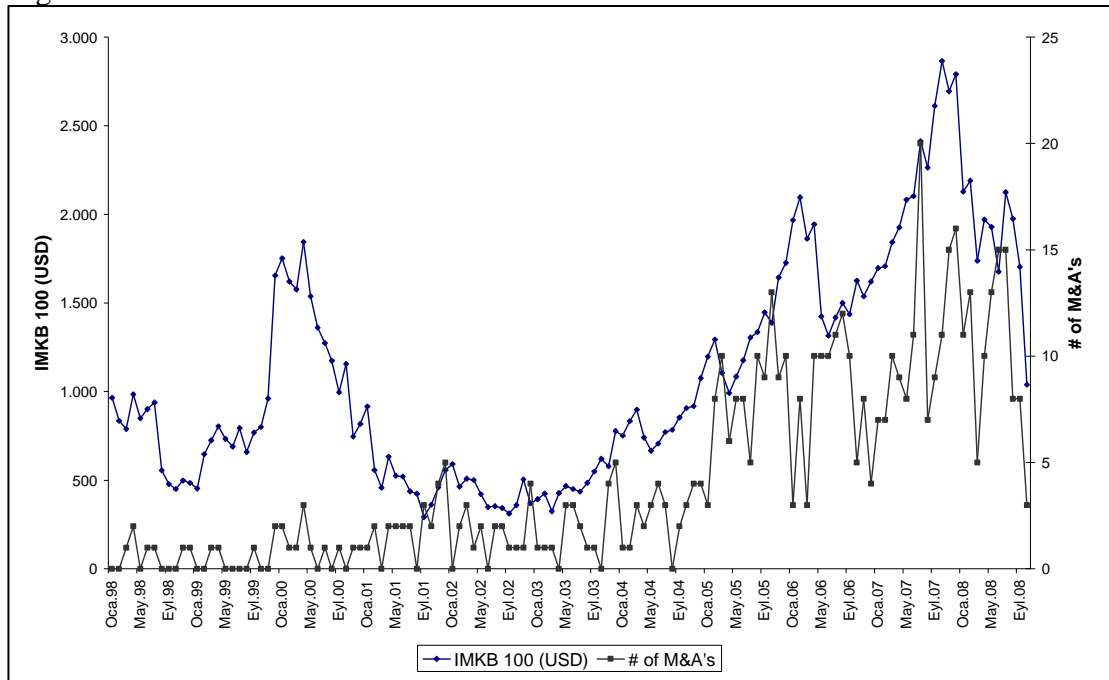


Table 9 presents the quarterly multiple regression results between quarterly number of M&A's and macroeconomic variables. Accordingly we can explain 87 percent of variation in quarterly number of M&A activity, with these macroeconomic variables. Stock market index and liquidity are the two significant variables in the regression equation at 90% confidence level.

Table 9 Quarterly Multiple Regression Results: Impact of Macroeconomic Variables on Quarterly Number of M&A's

<i>Regression Statistics</i>								
Multiple R		0,930						
R Square		0,865						
Adjusted R Square		0,835						
Standard Error		5,139						
Observations		39						
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	7	5261,74	751,68	28,47	0.000			
Residual	31	818,57	26,41					
Total	38	6080,31						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-15,3	17,69	-0,9	0,39	-51,35	20,80	-51,35	20,80
Stock Market Index**	0,0	0,0002	4,0	0,00	0,00	0,00	0,00	0,00
Interest Rate	0,0	0,093	-0,1	0,96	-0,19	0,18	-0,19	0,18
Exchange	0,1	0,0919	0,6	0,55	-0,13	0,24	-0,13	0,24
Inflation	11,5	39,28	0,3	0,77	-68,64	91,59	-68,64	91,59
Growth Rate	-0,2	0,28	-0,7	0,51	-0,77	0,39	-0,77	0,39
Liquidity	0,0	0,003	1,9	0,07	0,00	0,01	0,00	0,01
FDI*	0,0	0,020	1,2	0,23	-0,02	0,06	-0,02	0,06

* Significant at 90% confidence level

** Significant at 95% confidence level

After excluding non-significant variables stepwise least squares regression is run again on the number M&A activity. Table 10 shows the results. Stock market index, liquidity and FDI are the three significant variables having an impact on the number of M&A's in Turkey.

Table 10 Quarterly Stepwise Regression Results: Determinants of Quarterly Number of M&A's

<i>Regression Statistics</i>								
Multiple R	0,926							
R Square	0,858							
Adjusted R Square	0,846							
Standard Error	4,967							
Observations	39							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	3	5216,933	1738,978	70,49575	0.000			
Residual	35	863,3744	24,66784					
Total	38	6080,308						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept**	-6,909	2,856	-2,4	0,021	-12,707	-	-	-1,110
Index**	0,001	0,000	7,0	0,000	0,000	0,001	0,000	0,001
Liquidity*	0,005	0,002	2,0	0,057	0,000	0,009	0,000	0,009
FDI**	0,033	0,016	2,1	0,043	0,001	0,065	0,001	0,065

* Significant at 90% confidence level

** Significant at 95% confidence level

Excluding the non-significant variables did not result any loss in R square. We can still explain 86% of variation in quarterly number of acquisitions with variance in macroeconomic indicators. The performance of the stock market, as measured by ISE 100, is positively related to the quarterly number of M&A's. Moreover, liquidity as measured by monetary position and FDI are also positively related to quarterly number of M&A's. Therefore, high valuation and increase in stock market prices, FDI investment and presence of liquidity in the market is the main determinants effecting M&A's to take place. This finding favors behavioral theories of acquisitions and especially overvaluation hypothesis. Economic liquidity, measured as monetary position is more like a control variable with little impact on number of M&A's but presence is important to enable M&A's. This finding supports findings of Harford, 2004.

Table 11 presents the monthly regression results. Accordingly we can explain 74% of variation in monthly number of incidents with macroeconomic variables.

Stock market index and interest rate seem to be the two significant variables.

Table 11 Monthly Multiple Regression Results: Impact of Macroeconomic Variables on Monthly Number of M&A's

<i>Regression Statistics</i>								
Multiple R	0,861							
R Square	0,742							
Adjusted R Square	0,729							
Standard Error	2,315							
Observations	130							
 ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	6	1894,66	315,78	58,95	0,00			
Residual	123	658,91	5,36					
Total	129	2553,57						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept*	-5,11	2,87	-1,8	0,078	-10,794	0,584	-10,794	0,584
Index**	0,00	0,00	7,7	0,000	0,000	0,000	0,000	0,000
Interest Rate**	-0,03	0,02	2,0	0,046	0,001	0,062	0,001	0,062
Exchange	0,01	0,02	0,6	0,583	-0,028	0,050	-0,028	0,050
Inflation	-0,09	0,17	-0,5	0,610	-0,425	0,250	-0,425	0,250
Liquidity	0,00	0,00	1,6	0,104	0,000	0,002	0,000	0,002
FDI	0,00	0,00	0,7	0,459	-0,003	0,006	-0,003	0,006

* Significant at 90% confidence level

** Significant at 95% confidence level

Excluding the non significant variables (see Table 12), in monthly results again stock market index has the highest impact together with interest rate and liquidity.

Table 12 Monthly Stepwise Regression Results: Determinants of Monthly Number of M&A's

<i>Regression Statistics</i>								
Multiple R	0,860							
R Square	0,739							
Adjusted R Square	0,733							
Standard Error	2,300							
Observations	130							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	3	1887,31	629,10	118,97	0,00			
Residual	126	666,25	5,29					
Total	129	2553,57						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept**	-4,036	1,290	-3,128	0,002	-6,589	-1,483	-6,589	-1,483
Index**	0,000	0,000	12,941	0,000	0,000	0,000	0,000	0,000
Interest Rate**	-0,027	0,013	2,032	0,044	0,001	0,053	0,001	0,053
Liquidity*	0,001	0,001	1,918	0,057	0,000	0,002	0,000	0,002

* Significant at 90% confidence level

** Significant at 95% confidence level

So the regarding the hypotheses the relationship between number of M&A activity and exchange rate (Hypothesis 18), inflation (hypothesis 22), and GDP growth (hypothesis 20) are rejected both by the monthly and quarterly regression results. On the other hand the hypothesis, that there is a positive relation between stock market index and number of M&A's (hypothesis 21) is accepted. Also the hypothesis that there is a positive relation with the amount of liquidity in the economy (hypothesis 17) and the number of M&A's is accepted.

While there is a positive relationship between quarterly variation of M&A activity and FDI, there is no significant relationship with the amount of FDI flow and monthly M&A activity. So, hypothesis 16 is partly accepted.

The reverse is true for interest rate. While there is a negative relationship between monthly variation of M&A activity and interest rate, in monthly variation of

M&A activity there is no significant relationship with the interest rate. So, hypothesis 19 is partly accepted.

Determinants of Abnormal Returns to Target Firm Shareholders

Average abnormal returns to target firm shareholders (returns higher than stock market index return) are positive in general following one month after M&A's, but becomes negative after 3 months following the M&A.

Figure 21 One Month Abnormal Return

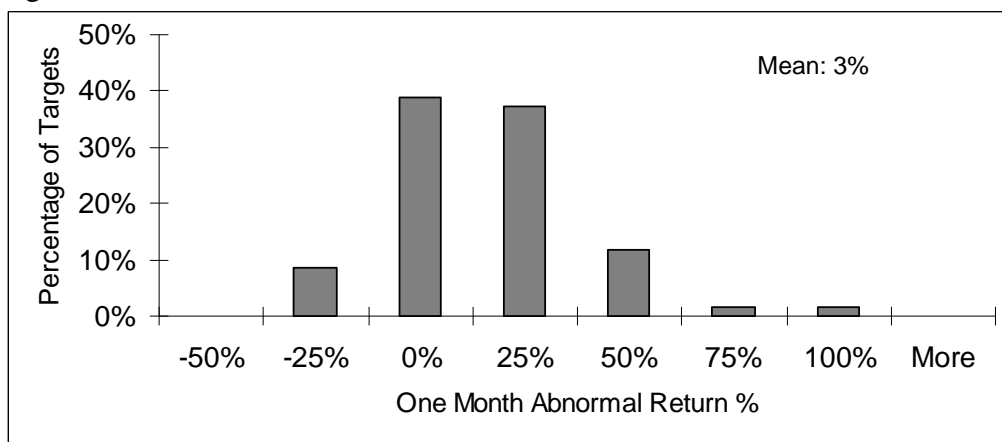
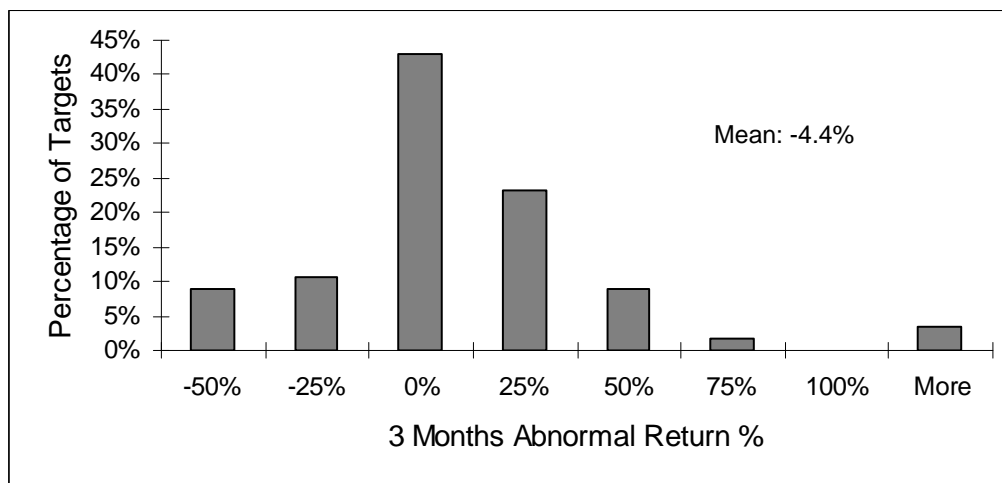


Figure 22 Three Months Abnormal Return



Despite existence of evidence for abnormal returns to target shareholders (Bhagat et al, 2005; Martynova and Rennebook, 2006), the findings of this study does not confirm these. Moreover, abnormal returns to target shareholders turns to negative

after three months of acquisition. This finding also favors behavioral theories of acquisition activity, which claim post-returns are negative and dispersion in post returns are very high.

Table 13 One Month Abnormal Return Regression

<i>Regression Statistics</i>								
Multiple R	0,345							
R Square	0,119							
Adjusted R Square	0,036							
Standard Error	0,239							
Observations	59							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	5	0,41	0,08	1,43	0,23			
Residual	53	3,03	0,06					
Total	58	3,44						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0,10	0,10	-1,0	0,32	-0,29	0,10	-0,29	0,10
Same Sector	0,02	0,08	0,29	0,77	-0,14	0,18	-0,14	0,18
Percent Share	0,10	0,12	0,83	0,41	-0,14	0,33	-0,14	0,33
Cross border / Domestic	0,12	0,08	1,68	0,12	-0,03	0,28	-0,03	0,28
Privatization	-0,11	0,12	-0,95	0,35	-0,34	0,12	-0,34	0,12
Cash	-0,08	0,06	-1,2	0,23	-0,21	0,05	-0,21	0,05

Table 13 shows the regression results, where deal characteristics are regressed on the one month abnormal return. R square is 0,12, but the adjusted R square is 0,04. Also the regression equation is not significant according to F test at 90% confidence level. Hence, there is no significant relation between deal specific variables and abnormal return. Looking at the p-values, also none of the variables is significant at 90% confidence level.

So, stock markets react to merger event positively and this reaction is dependent only on bid price, not to any of the deal related variables. Moreover, one

month after acquisition the mean return reduces to 3%, and -4%, 3 months after following the M&A.

Table 14 Three Months Abnormal Return Regression

<i>Regression Statistics</i>								
Multiple R	0,316							
R Square	0,100							
Adjusted R Square	0,012							
Standard Error	0,416							
Observations	57							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	5	0,982	0,196	1,135	0,354			
Residual	51	8,823	0,173					
Total	56	9,805						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0,236	0,169	-1,40	0,169	-0,575	0,103	-0,575	0,103
Same Sector	-0,134	0,140	-0,95	0,344	-0,416	0,148	-0,416	0,148
Percent Share	0,353	0,213	1,66	0,103	-0,074	0,780	-0,074	0,780
Cross border / Domestic	0,188	0,134	1,39	0,169	-0,082	0,458	-0,082	0,458
Privatization	-0,097	0,203	-0,47	0,635	-0,504	0,310	-0,504	0,310
Cash	-0,108	0,114	-0,94	0,351	-0,337	0,122	-0,337	0,122

Table 14 presents the regression results with three months return. Again there is no significant variable in the regression equation and F statistics is not significant at 90% confidence level. Hence the hypothesis that diversification negatively effect returns (hypothesis 8) is rejected. Also the hypothesis that all cash bids generate higher abnormal return (hypothesis 23) is rejected. So, medium of payment is unimportant. In addition, the hypothesis that cross-border acquisitions generate higher abnormal return (hypothesis 4) is rejected. Moreover, the hypothesis that as percentage of share exchanged increases, the returns increase (hypothesis 14) is rejected. On the other hand, we accept the hypothesis that privatization dummy variable has no significant impact on abnormal returns. The most probable reason for

that is since privatizations are announced beforehand the expectation of efficient management is incorporated into the stock market prices.

In order to validate results the same analysis is conducted by leaving 2008 apart, which may have effect of uncertain macroeconomic environment. The same results are obtained in the sample without 2008.

Target Firm Characteristics

Table 15 presents the differences between means test for target and non-target firms.

Compared to non-target firms, target firms have higher:

- Price increase one year before (1,6 times)
- Market to Book value (2.4 times)
- Market to Book Value Change (4.1 times)
- Book Value (2.6 times)
- Sales (1.6 times)*
- Total Debt (5.3 times)
- Change in Total Debt (19 times)
- Total Debt to Total Assets (2.6 times)
- P/E ratio (3.5 times)
- Net Profit (2.1 times)
- Total assets (2.9 times)

Target firms have lower

- Current ratio (23% less)

So Targets firms are bigger and more profitable than non-targets, in addition they are over performing firms in the stock market, whereas they are less liquid,

measured by current ratio, than non-target firms. Since they are also highly leveraged, the need for financing may be a reason for being acquired.

As a result we accept the hypothesis 25, that target firms are bigger in size compared to non-target firms, because of higher sales and total assets.

We also accept the hypothesis 26 that target firms have higher profits compared to non-target firms, because of higher net profit. On the other hand we do not accept the hypothesis 32 that target firms have higher Tobin's q compared to non-target firms. Also the ratio of net profit to total assets is insignificant. So high profit amounts are not because of higher profitability, rather because of higher size in terms of total sales.

In addition, we accept the hypothesis 28 that target firms are less liquid compared to non-target firms, because of smaller current ratio.

Hypothesis 29, which claims that target firms are more leveraged is also accepted, since targets have higher debt, increase in the amount of total debt and the ratio of total debt to total assets.

Lastly we accept the hypothesis 30 that target firms are more highly valued compared to non-target firms, because of P/E ratio and M/B ratio.

These findings in general contradict with some of the prior studies. For example, Harford (1999) expects high M/B having firms are less likely to be targeted. Palepu (1986), further claim that the lower the profitability, the lower the leverage (total debt), the smaller the size, the higher is the probability of being targeted. This proves that findings can differ by period of study and country under study.

Table 15 Target vs. Non-Target Firms Differences between means F-test

	Variable	Non-Target	Target ¹⁶	F-Test	P-Value
1	Price	13.195 99.051 3.607	24.256 145.502 19.105	0.621	0.569
2	Price Increase**	0.404 0.826 0.03	0.641 0.914 0.12	4.339	0.038
3	Market to Book Value**	1.84 6.98 0.254	4.641 13.32 1.749	7.313	0.007
4	Change in Market to Book Value**	0.155 0.976 0.036	0.641 1.923 0.253	11.117	0.001
5	Book Value to Total Assets**	0.537 0.262 0.01	0.464 0.334 0.044	4.029	0.045
6	Book Value to Total Assets Change	-0.034 1.057 0.038	-0.16 1.596 0.21	0.703	0.402
7	Book Value**	391.964 1260.035 45.888	1005.581 1643.323 215.779	12.172	0.001
8	Book Value Change	0.179 1.253 0.046	0.042 1.589 0.209	0.614	0.434
9	Total Debt**	0.54 1.48 0.054	2.902 12.651 1.661	22.597	0.000
10	Change in Total Debt**	0.107 2.174 0.079	2.017 14.226 1.868	10.544	0.08
11	Total Debt to TA*	0.007 0.045 0.002	0.018 0.069 0.009	3.08	0.92
12	Total Debt to NP	0.135 1.901 0.069	0.24 1.419 0.186	0.171	0.679
13	Sales*	639.739 2674.064 97.384	1256.794 2963.643 389.145	2.822	0.093
14	P/E Ratio*	13.264 141.332 5.147	46.145 164.48 21.597	2.844	0.092
15	P/E Ratio Change	-0.148 28.418 1.035	0.915 3.868 0.508	0.081	0.776

¹⁶ Cells contain mean, standard deviation, standard error

	Variable	Non-Target	Target ¹⁶	F-Test	P-Value
16	Net Profit**	53.997 200.937 7.318	114.966 370.944 48.707	4.24	0.03
17	Net Profit Change	1.128 47.903 1.745	3.542 15.973 2.097	0.146	0.703
18	NP to TA (Return on Assets)	0.043 0.109 0.004	0.051 0.112 0.015	0.356	0.551
19	NP to TA Change (Change in ROA)	0.13 29.439 1.072	2.72 11.738 1.541	0.443	0.506
20	EBITDA	70.355 296.934 10.814	130.324 316.199 41.519	2.176	0.141
21	Current Assets	530.535 3321.691 120.969	371.302 760.173 99.816	0.133	0.716
22	CA to TA**	0.504 0.24 0.009	0.388 0.292 0.038	12.186	0.000
23	EBITDA over Assets	0.097 0.137 0.005	0.12 0.137 0.018	1.523	0.217
24	Total Assets**	1851.235 9403.348 342.45	5351.277 11960.55 1570.497	7.151	0.008
25	Change in Total Assets	0.235 0.383 0.014	0.26 0.477 0.063	0.228	0.633
26	Net Debt	63.443 530.95 19.336	64.797 314.478 41.293	0	0.985
27	Net Debt to Total Assets	0.07 0.246 0.009	0.082 0.38 0.05	0.119	0.731
28	Tobin's Q	1.057 2.155 0.078	1.484 2.06 0.27	2.127	0.145
29	Enterprise Value**	584.273 1998.237 72.771	2201.504 3792.344 497.959	29.818	0.000

* Significant at 90% confidence level

** Significant at 95% confidence level

To analyze the differences between acquisition years and non-acquisition years we also performed a stepwise discriminant analysis. Table 16 summarizes the results.

The discriminant analysis is significant at 95% confidence level. If we look

classification figures we have 67% correct classification. Classification of target firms is much higher with 93%. Standardized canonical discriminant function coefficients are the main discriminating factors between acquisition years and non-acquisition years, therefore based on variables entering the discriminant function as coefficients we decide about the hypotheses. Change in the P/E ratio and the change in NP/TA (Net profit / total assets) are the main two variables used in discriminant function. So firms engage in transaction right after best performed years in the stock market. This may be a sign for the motive for the target firm's owners to exchange their high valued shares with cash. In addition, firms are being targeted or sold when they have high profitability.

Hence they engage into transaction when they are high valued compared to their earnings and their return on assets is increased. Therefore hypothesis 31 is accepted that target firms have higher value compared to non-target years. Also hypothesis 27 is accepted, since target firms have higher profitability measured by return on assets compared to non-target years.

Table 16 Stepwise Discriminant Function Statistics

Test of Function(s)	Wilks' Lambda	Wilks' Lambda		Sig.
		Chi-square	df	
1	0.92	11.351	2	0.003
Standardized Canonical Discriminant Function Coefficients				
	Function			
	1			
P/E Change	0.81			
NP/TA Change	0.678			

Table 17 Discriminant Function Classification

		Actual		Correct Prediction	In the Data
		0	1		
Prediction	0	81	45	64%	59%
	1	1	13	93%	41%
Correct Prediction		99%	78%	67%	
In the Data		59%	41%		

Differences between Target and Acquirer Firm

To analyze the differences between target and acquirer firms in 2001-2008 period, discriminant analysis is performed.

The stepwise discriminant analysis where we test the differences between acquirer and target firm characteristics is significant at 95% confidence interval according to Wilks' Lambda test (see Table 18). Price change, current assets and asset change are the main variables used in discriminant function. While high price increase last year is a contributor for the target firms, asset change prior year and current assets are the two variables contributing to the probability of being an acquirer firm. So firms engage in transaction after best performed years, and big acquires buy these firms. The asset change is also an indicator that these firms engaged a transaction last year as well. The findings of discriminant analysis are in line with the means of difference test results.

Based on the discriminant function coefficients; targets firms are smaller than acquirers, which means hypothesis 33 is accepted. Moreover, target firms are less liquid than acquirer firms, confirming hypothesis 35.

Besides they got acquired when they are over performing in stock market with high price increase, therefore hypothesis 36 is accepted. This means they engage into transaction when their share value is highly increased.

On the other hand we reject the hypothesis 34 that acquirer firms are more profitable than target firms. This means acquirer firms are in search of a best utilization of their asset which in this case is buying a small and promising target firm.

Table 18 Stepwise Discriminant Function Statistics

Test of Function(s)	Wilks' Lambda		df	Sig.
	Wilks' Lambda	Chi-square		
1	0.785	22.406	3	0
Standardized Canonical Discriminant Function Coefficients				
	Function 1			
Price Increase	-0.578			
Current Assets	0.46			
Asset Change	0.582			

If we look classification figures we have 70% correct classification. Classification of target firms is higher with 81%.

Table 19 Discriminant Function Classification

		Actual		Correct Prediction	In the Data
		0	1		
Prediction	0	50	25	67%	56%
	1	4	17	81%	44%
Correct Prediction		93%	40%	70%	
In the Data		56%	44%		

Table 19 presents the differences between means of target and acquirer firm specific variables. Accordingly;

Target firms have higher;

- Price increase one year before (2,6 times)
- Market to Book Value Change
- P/E ratio change

Acquirer firms have higher

- Market Capitalization (1.8 times)
- Book Value (1.9 times)
- Book Value Change (16 times)
- Sales (4.2 times)
- Net profit (2.7 times)
- EBITDA (5.4 times)
- Current Assets (14.8 times)
- Total Assets (2 times)
- Change in total assets (2.3 times)

Table 20 Target vs. Acquirer Firms Differences

	Variable	Target	Acquirer ¹⁷	F-test	P-Value
1	Price	25.373	4.378	0.811	0.34
		150.825	4.058		
		20.525	0.626		
2	Price Increase**	0.63	0.24	6.099	0.015
		0.935	0.469		
		0.127	0.072		
3	Market to Book Value of Equity	4.772	1.44	2.311	0.132
		13.793	3.767		
		1.877	0.581		
4	Change in Market to Book Value**	0.628	-0.145	6.015	0.016
		1.986	0.525		
		0.27	0.081		
5	Book Value to Total Assets	0.435	0.477	0.413	0.522
		0.294	0.357		
		0.04	0.055		
6	Book Value to Total Assets Change	-0.236	0.016	1.026	0.314
		1.562	0.432		
		0.213	0.067		
7	Book Value of Equity**	1008.678	1953.566	4.959	0.028
		1664.747	2483.947		
		226.543	383.281		
8	Book Value Change*	0.045	0.711	3.617	0.06
		1.648	1.772		
		0.224	0.273		
9	Total Debt	3.074	0.283	1.878	0.174
		13.102	1.648		
		1.783	0.254		
10	Change in Total Debt	2.156	-0.461	1.283	0.26
		14.743	2.845		
		2.006	0.439		
11	Total Debt to Total Assets	0.019	0.001	2.657	0.106
		0.071	0.006		
		0.01	0.001		
12	Total Debt to Net Profit	0.251	-0.011	1.328	0.252
		1.471	0.102		
		0.2	0.016		
13	Sales**	1055.207	4478.374	6.419	0.013
		2423.742	9554.296		
		329.83	1474.26		
14	P/E Ratio	47.397	6.71	2.304	0.132
		170.224	38.126		
		23.165	5.883		
15	P/E Ratio Change*	0.902	-0.343	3.821	0.054
		4	1.14		
		0.544	0.176		

¹⁷ Cells contain mean, standard deviation and standard error.

	Variable	Target	Acquirer ¹⁷	F-test	P-Value
16	Net Profit**	111.735	305.053	4.557	0.035
		376.184	511.126		
		51.192	78.868		
17	Net Profit Change	3.799	0.809	1.337	0.25
		16.535	2.921		
		2.25	0.451		
18	NP / TA	0.051	0.055	0.043	0.836
		0.114	0.07		
		0.015	0.011		
19	NP to TA Change	2.805	0.194	1.913	0.17
		12.138	1.628		
		1.652	0.251		
20	EBITDA**	118.96	642.81	10.611	0.002
		300.837	1133.045		
		40.939	174.833		
21	Current Assets**	334.829	4958.289	8.41	0.004
		690.532	11707.46		
		93.97	1806.5		
22	CA / TA	0.374	0.366	0.023	0.88
		0.293	0.223		
		0.04	0.034		
23	EBITDA over Assets	0.109	0.1	0.173	0.678
		0.113	0.102		
		0.015	0.016		
24	Total Assets*	5625.703	11585.74	3.107	0.081
		12341.6	20552.73		
		1679.479	3171.354		
25	Assets Change**	0.286	0.64	4.056	0.047
		0.47	1.175		
		0.064	0.181		
26	Net Debt (ND)	74.288	410.417	1.379	0.243
		316.377	2075.523		
		43.053	320.26		
27	ND to Total Assets	0.051	0.045	0.013	0.908
		0.329	0.178		
		0.045	0.027		
28	Tobin's Q	1.298	1.012	1.321	0.253
		1.46	0.781		
		0.199	0.121		
29	Enterprise Value**	2263.211	4323.927	4.133	0.045
		3910.122	5990.26		
		532.1	924.317		

* Significant at 90% confidence level

** Significant at 95% confidence level

Predicting the Acquisition Event and Prediction Model Performance

Table 21 compares different model's performance in terms of prediction accuracy, percentage of target firms predicted correctly and target firm prediction accuracy. Accordingly, decision tree did the best prediction both in out-of sample data and target firms in acquisition years and non-acquisitions years data. Neural networks, is the second best and logistic regression was the third.

In terms of general prediction capability we can conclude that we can predict target firms, whereas we can not predict timing of acquisition. This means hypotheses 37 is accepted, but hypothesis 38 is rejected.

Table 21 Prediction Model Performance Comparison

Model	Data	Correct Prediction Response	Target Correct Prediction Accuracy	Percentage of Targets Predicted Correctly	Lift ¹⁸
Logistic Regression	Out of Sample Comparison	81%	15%	50%	2.1
Decision Tree C5.0	Out of Sample Comparison	93%	50%	17%	7.1
Neural Networks	Out of Sample Comparison	85%	19%	33%	2.7
Logistic Regression	Same firms different years	71%	17%	25%	1.1
Decision Tree C5.0	Same firms different years	79%	27%	25%	1.8
Neural Networks	Same firms different years	65%	21%	50%	1.4

¹⁸ Lift is calculated by dividing correct prediction percentage of targets by percentage of targets in the sample

Results with Out-of Sample Prediction

Logistic Regression

Table 22 gives the classification results of hold-out sample. Based on hold-out sample results we can correctly classify 81% of cases using logistic regression. Correct classification of acquisition cases is 15%, which normally is 7% in the data. Correct prediction of non-acquisition cases yield 95%, which normally is 93%. So we can increase the prediction power in predicting acquisition cases without sacrificing non-acquisition case correct prediction percentage.

Table 22 Logistic Regression Hold-Out Sample Classification

		Actual		Correct Prediction	In the Data
		0	1		
Prediction	0	124	6	95%	93%
	1	33	6	15%	7%
Correct Prediction		79%	50%	81%	
In the Data		93%	7%		

Table 23 shows the coefficients of logistic regression equation as a result of the stepwise process. Likelihood ratio chi-square statistics is significant since p value is smaller than .0001. Variables effecting target firm prediction positively are: Price Increase, Book Value, Leverage, Sales, P/E Ratio, P/E Ratio Change, Net Profit Change, EBITDA, Total Assets, Net Debt, Tobin's Q and Enterprise Value. So the bigger the size (measured by total assets, enterprise value and sales); the higher the stock market valuation (measured by P/E ratio and P/E ratio change); the higher the profitability (measured by Tobin's q); the higher the growth in profitability (measured by net profit change); the higher the leverage (measured by net debt); the higher the probability of being targeted.

On the other hand variables effecting non-target firm prediction are: BV/TA, CA / TA, ND/TA, and Asset Change. The higher the changes in the total assets, the more liquid a firm is (measured by current ratio CA/TA) the lower the probability of being targeted. These are in line with differences between target and non-target firms analysis.

Table 23 Logistic Regression Equation

Likelihood Ratio Test for Global Null Hypothesis: BETA=0					-2 Log Likelihood	
Intercept Only	Intercept & Covariates	Likelihood Ratio Chi-Square	DF	Pr>ChiSq		
1323.9	918.9	405.1	17	<.0001		
Analysis of Maximum Likelihood Estimates						
Parameter	Estimate	Standard Error	Wald Chi-Square	Pr>ChiSq	Standardized Estimate	Exp(Est)
Intercept	1.26	0.29	18.9	<.0001	3.52	
Price Increase	0.29	0.12	5.82	0.0159	0.14	1.34
BV/TA	-2.97	0.42	50.44	<.0001	-0.49	0.05
BV	0.00	0.00	10.9	0.001	0.65	1.00
Leverage	0.08	0.02	12.91	0.0003	0.46	1.08
Sales	0.00	0.00	13.65	0.0002	0.36	1.00
P/E Ratio	0.01	0.00	22.18	<.0001	0.67	1.01
P/E Ratio Change	0.03	0.01	7.22	0.0072	0.39	1.03
Net Profit Change	0.05	0.01	11.08	0.0009	0.27	1.05
EBITDA	0.00	0.00	13.42	0.0002	-0.51	1.00
CA / TA	-2.20	0.37	36.09	<.0001	-0.33	0.11
Total Ass.	0.00	0.00	19.33	<.0001	-0.89	1.00
Asset Change	-1.08	0.30	13.21	0.0003	-0.21	0.34
Net Debt	0.00	0.00	11.88	0.0006	-0.26	1.00
ND/TA	-1.71	0.40	18.47	<.0001	-0.30	0.18
Tobin's Q	0.66	0.09	54.36	<.0001	0.64	1.94
EV	0.00	0.00	16.97	<.0001	0.74	1.00

Table 24 Logistic Regression Fit Statistics

Fit Statistics		Train	Validation
AIC	Akaike's Information Criterion	954.85	
ASE	Average Squared Error	0.15	0.168
AVERR	Average Error Function	0.48	0.711
DFE	Degrees of Freedom for Error	937	
DFM	Model Degrees of Freedom	18	
DFT	Total Degrees of Freedom	955	
DIV	Divisor for ASE	1910	480
ERR	Error Function	918.85	341.431
FPE	Final Prediction Error	0.16	
MAX	Maximum Absolute Error	1	1
MSE	Mean Square Error	0.15	0.168
NOBS	Sum of Frequencies	955	240
NW	Number of Estimate Weights	18	
RASE	Root Average Sum of Squares	0.39	0.41
RFPE	Root Final Prediction Error	0.4	
RMSE	Root Mean Squared Error	0.39	0.41
SBC	Schwarz's Bayesian Criterion	1042.36	
SSE	Sum of Squared Errors	287.08	80.692
SUMW	Sum of Case Weights Times Freq	1910	480
MISC	Misclassification Rate	0.19	0.192

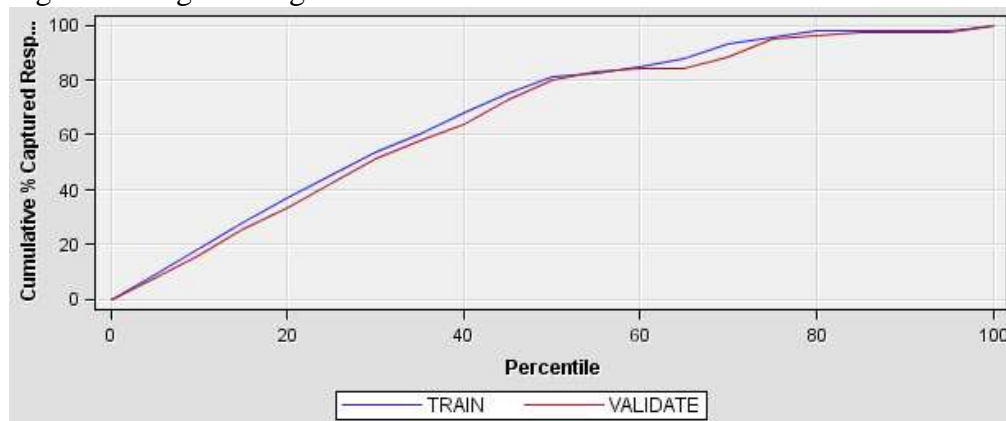
Table 25 gives the gain statistics for the validation sample of logistic regression. This table can be used as an alternative method for assessing the accuracy of the model. The table gives gains and lifts of the based on posterior probability score percentiles. Ideally we would expect the lifts and cumulative lifts being highest at lower percentiles and converge to 1 at 100 percentile. In general the rank order works fine except between percentiles 15-30.

Table 25 Logistic Regression Validation Sample Gains

Percentile	Gain	Lift	Cumulative Lift	% Response	Cumulative % Response	Observation Number	Posterior Probability Mean
0	.	.	.	.	.	.	.
5	48.76	1.49	1.49	75.0	75.0	12	0.99
10	57.02	1.65	1.57	83.3	79.2	12	0.97
15	70.80	1.98	1.71	100.0	86.1	12	0.95
20	65.29	1.49	1.65	75.0	83.3	12	0.92
25	68.60	1.82	1.69	91.7	85.0	12	0.87
30	70.80	1.82	1.71	91.7	86.1	12	0.81
35	65.29	1.32	1.65	66.7	83.3	12	0.75
40	59.09	1.16	1.59	58.3	80.2	12	0.67
45	61.62	1.82	1.62	91.7	81.5	12	0.57
50	60.33	1.49	1.60	75.0	80.8	12	0.51
55	50.26	0.50	1.50	25.0	75.8	12	0.45
60	40.50	0.33	1.40	16.7	70.8	12	0.38
65	29.69	0.00	1.30	0.0	65.4	12	0.34
70	26.33	0.83	1.26	41.7	63.7	12	0.32
75	26.72	1.32	1.27	66.7	63.9	12	0.29
80	19.83	0.17	1.20	8.3	60.4	12	0.26
85	14.73	0.33	1.15	16.7	57.8	12	0.22
90	8.36	0.00	1.08	0.0	54.6	12	0.19
95	2.65	0.00	1.03	0.0	51.8	12	0.14
100	0.00	0.50	1.00	25.0	50.4	12	0.07

Figure 23 further illustrated the lift curves of train and validation samples. Since these two go parallel we may conclude the model has a high accuracy.

Figure 23 Logistic Regression Lift Curve



Decision Tree

Based on hold-out sample results we can correctly classify 93% of cases using C5.0 decision tree algorithm. Correct classification of acquisition cases is 50%, which normally is 7% in the data. Correct prediction of non-acquisition cases yield 94%, which normally is 93%. So we can increase the prediction power in predicting acquisition cases without sacrificing non-acquisition case correct prediction percentage. Although decision tree can not capture high number of actual acquisition cases, its correct prediction rate is very high. So it shoots very rare but very accurately.

Table 26 Decision Tree Hold-Out Sample Classification

		Actual		Correct Prediction	In the Data
		0	1		
Prediction	0	155	10	94%	93%
	1	2	2	50%	7%
Correct Prediction		99%	17%	93%	
In the Data		93%	7%		

Figure 24 Decision Tree Hold-Out Sample Lift Curve

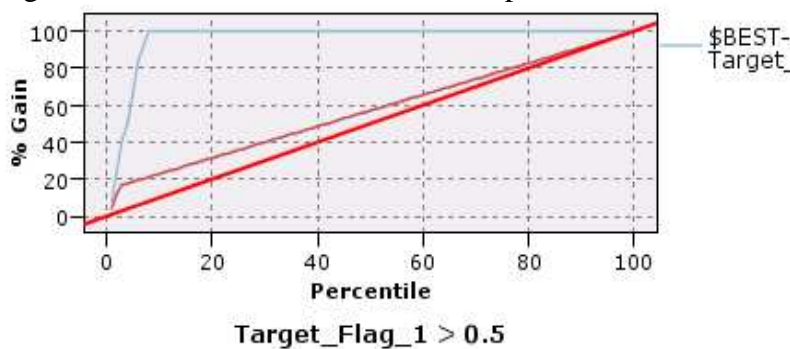
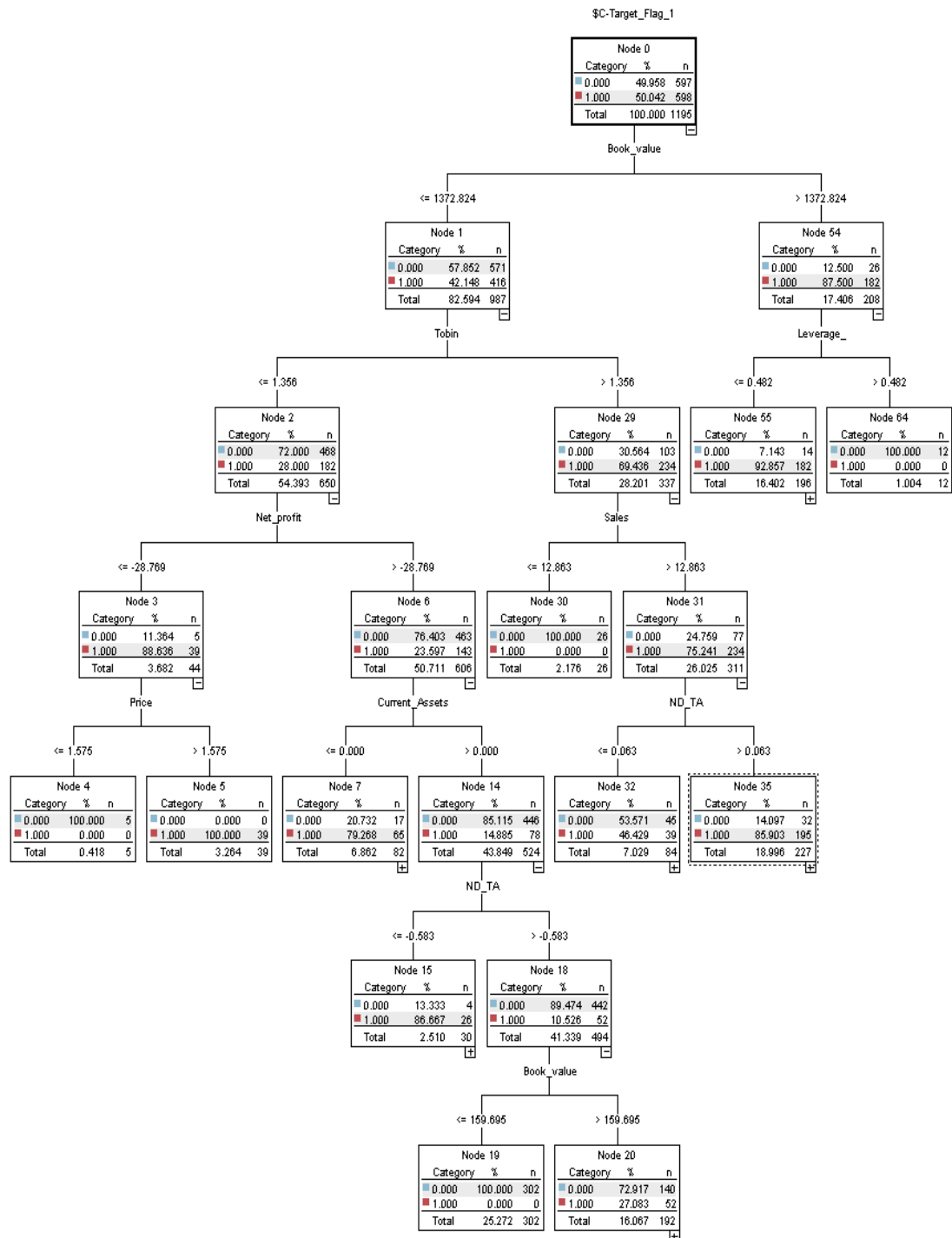


Figure 25 illustrates the decision tree rules used for prediction. This tree can be used to find general rules for target firms.

Figure 25 Decision Tree



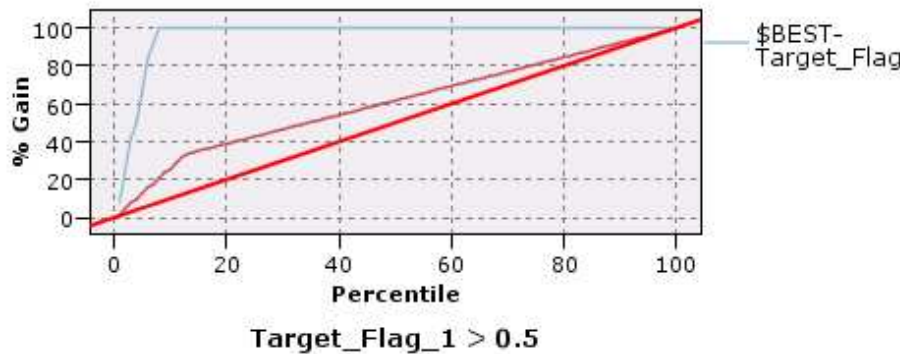
Neural Networks

Based on Hold-out sample results we can correctly classify 85% of cases using neural networks. Correct classification of acquisition cases is 19%, which normally is 7% in the data. Correct prediction of non-acquisition cases yield 95%, which normally is 93%. So we can increase the prediction power in predicting acquisition cases without sacrificing non-acquisition case correct prediction percentage.

Table 27 Neural Networks Hold-Out Sample Classification

		Actual		Correct Prediction	In the Data
		0	1		
Prediction	0	140	8	95%	93%
	1	17	4	19%	7%
Correct Prediction		89%	33%	85%	
In the Data		93%	7%		

Figure 26 Neural Networks Hold-Out Sample Lift Curve



Results with Target Firms in Acquisition Years and Non-Acquisitions Years Data

Logistic Regression

Table 28 gives the classification results of hold-out sample. Based on hold-out sample results we can correctly classify 71% of cases using logistic regression. Correct classification of acquisition cases is 17%, which normally is 15% in the data. Correct

prediction of non-acquisition cases yields 86%, which normally is 85%. So the model has no predictive power.

Table 28 Logistic Regression Hold-Out Sample Classification

		Actual		Correct Prediction	In the Data
		0	1		
Prediction	0	55	9	86%	85%
	1	15	3	17%	15%
Correct Prediction		79%	25%	71%	
In the Data		85%	15%		

Table 28 shows the coefficients of logistic regression equation as a result of the stepwise process. Likelihood ratio chi-square statistics is significant at 95%.

Variables effecting target firm prediction positively are: Price increase and total assets. So the higher the price increase the higher the chance of being in a deal. This is in line with our previous findings that target firms are sold after high price increases and when they are overvalued. On the other hand the decrease in likelihood ratio is marginal which means that the model's marginal predictive power is not very high.

Table 29 Logistic Regression Equation

Likelihood Ratio Test for Global Null Hypothesis: BETA=0 -2 Log Likelihood						
Intercept Only	Intercept & Covariates	Likelihood Ratio Chi-Square	DF	Pr>ChiSq		
427.4	415.2	12.2	2	0.0022		
Analysis of Maximum Likelihood Estimates						
Parameter	Estimate	Standard Error	Wald Chi-Square	Pr>ChiSq	Standardized Estimate	Exp(Est)
Intercept	-0.408	0.145	7.89	0.01	0.67	
Price Increase	0.365	0.153	5.71	0.02	0.16	1.441
Total Assets	0.000	0.000	4.89	0.03	0.16	1

Table 30 Logistic Regression Fit Statistics

Fit Statistics		Train	Validation
AIC	Akaike's Information Criterion	421.221	
ASE	Average Squared Error	0.239	0.248
AVERR	Average Error Function	0.672	0.69
DFE	Degrees of Freedom for Error	306	
DFM	Model Degrees of Freedom	3	
DFT	Total Degrees of Freedom	309	
DIV	Divisor for ASE	618	158
ERR	Error Function	415.221	108.987
FPE	Final Prediction Error	0.244	
MAX	Maximum Absolute Error	0.821	0.752
MSE	Mean Square Error	0.241	0.248
NOBS	Sum of Frequencies	309	79
NW	Number of Estimate Weights	3	
RASE	Root Average Sum of Squares	0.489	0.498
RFPE	Root Final Prediction Error	0.494	.
RMSE	Root Mean Squared Error	0.491	0.498
SBC	Schwarz's Bayesian Criterion	432.421	
SSE	Sum of Squared Errors	147.752	39.183
SUMW	Sum of Case Weights Times Freq	618	158
MISC	Misclassification Rate	0.362	0.392

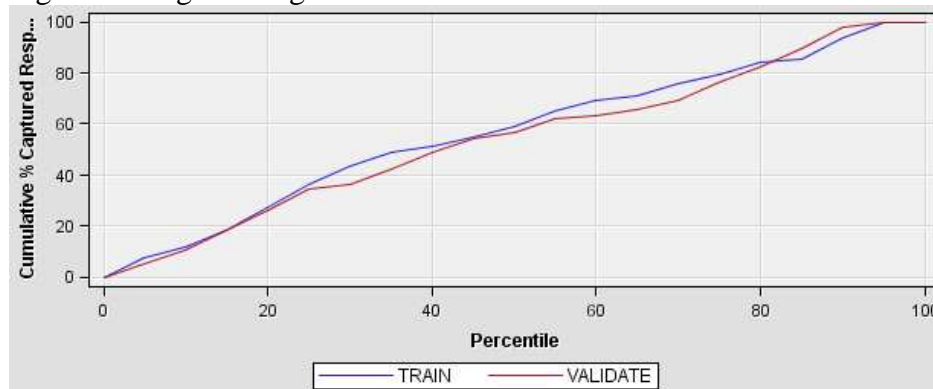
Table 31 gives the gain statistics for the validation sample of logistic regression. This table can be used as an alternative method for assessing the accuracy of the model. The table gives gains and lifts of the based on posterior probability score percentiles. Ideally we would expect the lifts and cumulative lifts being highest at lower percentiles and converge to 1 at 100 percentile. In the below table the we don't have an ideal sorting of lifts, which again causes us to doubt about the accuracy of the model.

Table 31 Logistic Regression Validation Sample Gains

Percentile	Gain	Lift	Cumulative Lift	% Response	Cumulative % Response	Observation Number	Posterior Probability Mean
0	.	.	.	.	.	.	.
5	2.63	1.03	1.03	49.37	49.37	3.95	0.69
10	2.63	1.03	1.03	49.37	49.37	3.95	0.58
15	20.18	1.55	1.20	74.68	57.81	3.95	0.54
20	28.95	1.55	1.29	74.68	62.03	3.95	0.52
25	36.84	1.68	1.37	81.01	65.82	3.95	0.50
30	20.18	0.37	1.20	17.72	57.81	3.95	0.47
35	20.30	1.21	1.20	58.23	57.87	3.95	0.46
40	22.37	1.37	1.22	65.82	58.86	3.95	0.45
45	20.18	1.03	1.20	49.37	57.81	3.95	0.44
50	13.16	0.50	1.13	24.05	54.43	3.95	0.44
55	12.20	1.03	1.12	49.37	53.97	3.95	0.42
60	5.26	0.29	1.05	13.92	50.63	3.95	0.41
65	1.21	0.53	1.01	25.32	48.69	3.95	0.41
70	-1.13	0.68	0.99	32.91	47.56	3.95	0.40
75	1.75	1.42	1.02	68.35	48.95	3.95	0.40
80	2.63	1.16	1.03	55.70	49.37	3.95	0.38
85	5.26	1.47	1.05	70.89	50.63	3.95	0.38
90	8.48	1.63	1.08	78.48	52.18	3.95	0.38
95	5.26	0.47	1.05	22.78	50.63	3.95	0.37
100	0.00	0.00	1.00	0.00	48.10	3.95	0.36

Figure 27 further illustrated the lift curves of train and validation samples. There is very little lift in the model.

Figure 27 Logistic Regression Lift Curve



Decision Tree

Based on hold-out sample results we can correctly classify 79% of cases using C5.0 decision tree algorithm. Correct classification of Acquisition cases is 27%, which normally is 15% in the data. Correct prediction of non-acquisition cases yield 87%, which normally is 85%. So we can increase the prediction power in predicting acquisition cases without sacrificing non-acquisition case correct prediction percentage. Despite low performance of logistic regression, decision tree has some predictive power in same firms but different year's data.

Table 32 Decision Tree Hold-Out Sample Classification

		Actual		Correct Prediction	In the Data
		0	1		
Prediction	0	62	9	87%	85%
	1	8	3	27%	15%
Correct Prediction		89%	25%	79%	
In the Data		85%	15%		

Figure 28 Decision Tree Hold-Out Sample Lift Curve

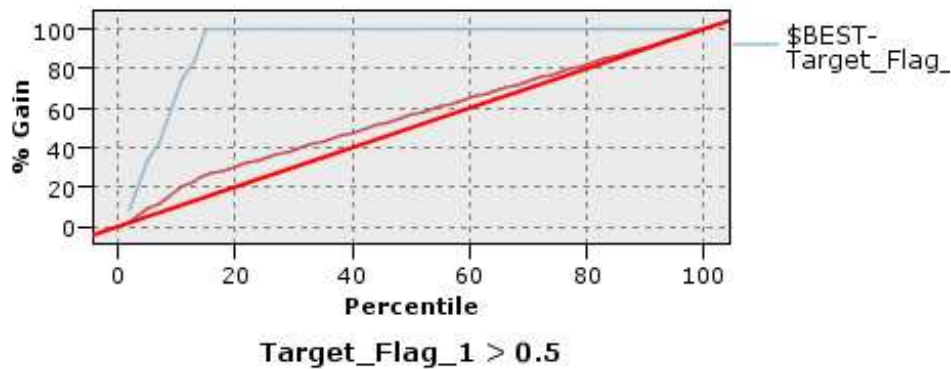
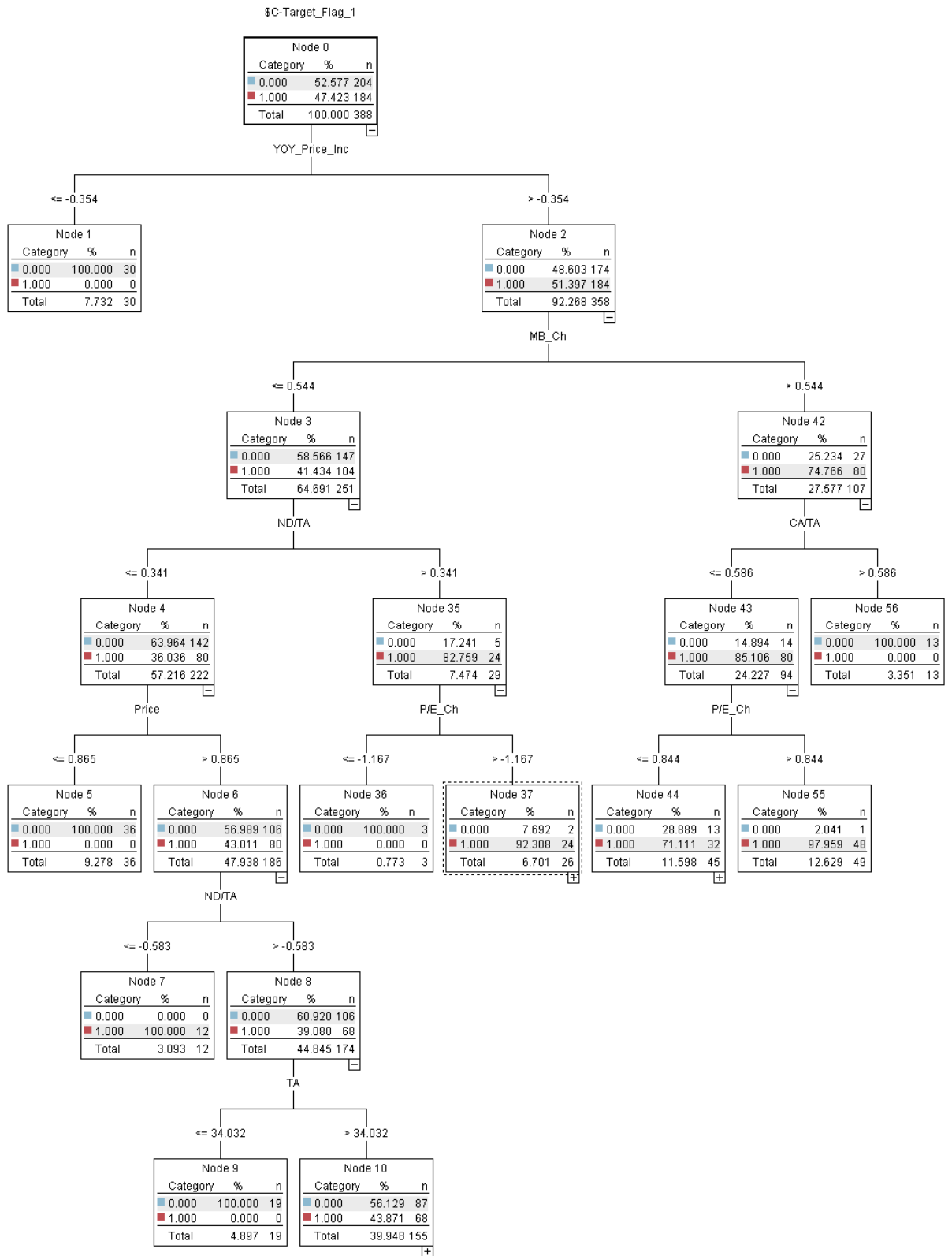


Figure 29 Decision Tree



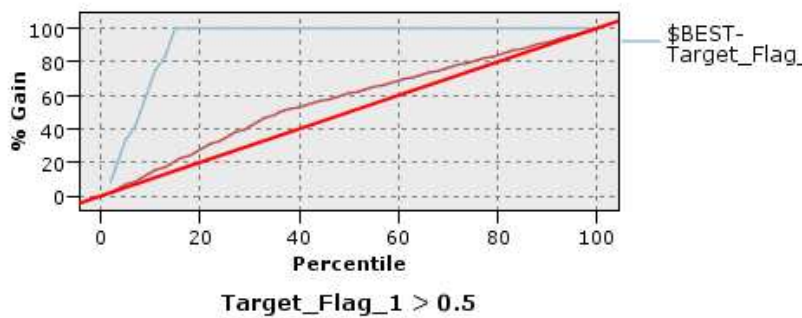
Neural Networks

Based on Hold-out sample results we can correctly classify 65% of cases using neural networks. Correct classification of acquisition cases is 21%, which normally is 15% in the data. Correct prediction of non-acquisition cases yield 89%, which normally is 85%. So the model has no predictive power.

Table 33 Neural Networks Hold-Out Sample Classification

		Actual		Correct Prediction	In the Data
		0	1		
Prediction	0	47	6	89%	85%
	1	23	6	21%	15%
Correct Prediction		67%	50%	65%	
In the Data		85%	15%		

Figure 30 Neural Networks Hold-Out Sample Lift Curve



CHAPTER 6: CONCLUSION

This study aims to explore the determinants and characteristics of M&A activity in Turkey during the 1998-2008 period. Six main issues are investigated: 1) the characteristics of M&A's in Turkey, 2) macroeconomic determinants of M&A activity in Turkey, 3) the determinants of abnormal return to target shareholders after acquisitions, 4) the differences between target and non-target firms, 5) the factors that discriminate between acquirer and target firms, 6) prediction of target firm and the M&A event.

There are very limited, only 3, merger cases in Turkey. Thus, Turkish M&A data consists of mainly from acquisition activity and mostly (89%) acquisition of majority shares. The acquisitions especially increase after 2004 and the period 2005-2008 can be called a wave, in line with theories that mergers and acquisitions come in waves (Harford 2004; Rhodes-Kropf and Viswanathan, 2004; Shleifer and Vishny, 2003; Toxvaerd, 2003). Cross-border M&A's constitute 62% of total M&A's during the period. Additionally, in 80% of cross-border M&A's the bidder company is foreign, while only in 13% of cross-border M&A's the bidder county is Turkey. Furthermore looking at the country of origin of acquirers, the interest of foreign firms is much more prevailing in the data than the interest of Turkish firms to invest abroad. In 46% of total transactions a foreign bidder acquired a Turkish firm, whereas acquisition of foreign firms by a Turkish bidder is only 5% of the total transactions. Turkish companies mainly focused on acquisition of domestic targets (37% of total M&A's). Based on these descriptive statistics, we conclude that M&A activity in Turkey is mainly led by foreign firm's acquisition of Turkish firms. In terms of sectoral breakdown 70% of targeted companies in a related sector with the

acquirer. Consumer goods and financial services are the main target industries (31% of total M&A's). Since these two industries are the two most concentrated industries, securing market power seems to be a significant consideration in related acquisitions. Construction, industrial products and services and energy are other three active sectors in M&A's, constituting another 29% of total. Other than these 5 sectors, foreign bidders are also interested in medical services industry, while domestic bidders are focused on leisure and business support services.

Looking at the motives of acquirers, main motives in Turkish M&A's are; a foreign firm entering a new market or purchasing an asset in Turkish market (33%), together with horizontal growth, namely acquisition of a competitor in the same sector (18%). Private equities investment and new investment of firms are the other two critical motives. Synergistic M&A's, such as joint ventures or strategic partnerships on the other hand, have a smaller portion of the total, compared to observations from other countries.

Regarding price per share paid in deals, the bid price is above the share price per share (bid premium) in 52% of the incidents, and lower in 48%. This fact is inconsistent with other market observations, where in 65-80% of cases, bid price is higher than share price (Martynova and Rennebook, 2006). On the other hand, bid price is higher than the stock price one month before the M&A in 61% of deals. We can therefore conclude, that acquirers do not pay a premium over the traded price for the acquired asset. In line with this, bid premia on average are positive one month before (8%) the announcement, and decreases to 6% one day before the announcement, possibly as a result of insider training. Bid premia further decreases to 3% one day after the announcement of M&A. So, stock market reacts positively to an offer price that is higher than traded share price, and closes the difference starting

from one month before the announcement. However, the bid premium one month after the announcement is same as the one month before (8%), thus the stock market reaction to a high bid price is temporary.

In this study deal characteristics are investigated in three stages using differences between means tests. In the initial stage, deal characteristics of cross-border and domestic acquisitions are compared. In the second stage, M&A characteristics before and after 2005 are evaluated. In the third stage, deal characteristics are analyzed based on the percentage of target firm acquired. Cross-border acquisitions differ from domestic acquisitions in terms of higher average deal values, and enterprise values of target firm, lower average percentage of shares exchanged, higher percentage of related acquisitions. So, cross-border bidders target bigger firms in size and more from the same sector they are operating and they are less willing to purchase whole shares as they may need local partners. Entering a new market and country at the same time is much more riskier, and therefore less common in the sample. On the other hand, there are no differences in bid premia and stock market reaction in terms of abnormal return to domestic or cross border acquisitions. This finding contradicts with prior evidence that cross-border acquisitions generate higher target shareholder return (Danbold, 2004).

In terms of yearly differences, percentage of related industry acquisitions is significantly higher in acquisitions before 2005. Also average percentage of shares transacted is significantly higher in acquisitions before 2005, while average size of the target firm is smaller. The finding that after 2004, acquirers buy lower percentage of shares and percentage of diversified acquisitions increase is mainly because of increased private equity or investment type of acquisitions after 2004. This evidence

further supports behavioral theories (managerial discretion, overvaluation hypothesis and musical chairs hypothesis) that expect more diversified bids in merger waves.

It is also found that contrary to control rights theory, there is no premium paid for control rights. The findings of Healy et al, (1997) that bid premia are increasing with percentage of shares transacted, is not supported in our sample. The only difference is that firms whose control right is acquired are smaller than firms whose minority shares are acquired.

In relation to macroeconomic determinants of M&A activity, two regression models are constructed once for the monthly variations in the number of M&A's, second for the quarterly variations. The results show that there is positive correlation between FDI inflow in Turkey and M&A activity. Similarly, real effective exchange rate, stock price index, GDP growth rate and liquidity have positive correlation with number of M&A's. On the other hand, inflation rate and interest rate have negative correlation with number of M&A activities. Stock price index and real effective exchange rate have the highest correlation coefficients with number of M&A's among all variables. Regression analysis reveals that using macroeconomic variables we can explain 86 percent of variation in quarterly number of M&A activity and 74% of variation in monthly number of M&A activity. Increase in stock market index, and presence of capital market liquidity are the main macroeconomic determinants effecting M&A's to take place. This finding again favors behavioral theories of acquisitions and especially overvaluation hypothesis of Shleifer and Vishny (2003), Rhodes -Kropf and Viswanathan (2004). Capital market liquidity as measured by monetary position is more like a control variable with little impact on number of M&A's but presence is important to enable them. This finding supports Harford, (2004).

The other two variables affecting number of M&A's are the interest rate and FDI inflow in Turkey. While there is a positive relationship between quarterly variation of M&A activity and FDI inflow, there is no significant relationship with the amount of FDI flow and monthly M&A activity. The reverse is true for interest rate. While there is a negative relationship between monthly variation of M&A activity and interest rate, there is no significant relationship in monthly variation of M&A activity and the interest rate.

In the analysis of abnormal return determinants, one month and three months cumulative abnormal returns (returns higher than stock market index return) are regressed on deal characteristics. Abnormal returns on average are positive in general following one month after M&A's, and negative 3 months after the announcement date. Despite existence of evidence for positive abnormal returns to target shareholders (Bhagat et al, 2005; Martynova and Rennebook, 2006), the findings of this study fail to confirm this evidence. Moreover, abnormal returns to target shareholders turn to negative three months after acquisition. This finding also favors behavioral theories of acquisition activity, which claim post-returns to target firm shareholders are negative and dispersion in post returns to target firm shareholders are very high.

In abnormal return analysis we failed to find a variable that is significantly affecting abnormal return. Hence, stock markets react to merger events positively and this reaction is dependent only on bid price, not to any of the deal related variables. Accordingly, there is no diversification discount, no premium paid for all cash bids, no premium paid for control rights and no extra reaction to cross-border acquisitions. These are also contradicting with most of the literature and other country evidence (Berger, Ofek, 95; Danbold, 2004; Moeller et al, 2004 and Andrade

et al, 2001). We can conclude that the stock market in Turkey does not consider and price any fundamentals related with deal characteristics, rather more speculative behavior is observed in reaction to M&A activities.

Target firm characteristics are analyzed using two approaches. In the initial approach target firms are compared with non-target firms. Analyzing target firms, we concluded that targets firms are bigger and have higher profits than non-target ones, in addition they are outperforming firms in the stock market with very high P/E ratios. However they are less liquid, measured by current ratio, than non-target firms. In many studies in the literature (Huges, 1993; Palepeu, 1986) targets are smaller than non-targets, nevertheless Turkish data shows that relatively big sized firms got acquired. Targets are also highly leveraged and the increase in total debt one year before is also higher compared to non-targets, which may be a reason for being acquired namely need for financing. However, they are not more profitable than non-target firms and they do not have a higher Tobin's Q. These finding in general contradicts with some of the prior studies. For example, Harford (1999) expects high M/B having firms are less likely to be targeted. Palepu (1986), further claim that the lower the profitability, the lower the leverage (total debt), the smaller the size, the higher is the probability of being targeted. This proves that findings can differ by period of study and country under study, since motives and drivers for M&A's can change from time to time and from country to country.

The second approach to investigation of targets, firm characteristics prior to the year of M&A are compared with those in non-acquisition years using discriminant analysis. Analyzing year of acquisition of target firms we concluded that they got acquired when their total market value increase, have high P/E ratio and higher return on assets. The discriminant analysis between two groups also show that

targets engage into transaction when they increase in total value and profitability, and right after best performed years in the stock market. This evidence supports that owners of target firms want to cash their high valued shares in line with behavioral theories, especially overvaluation hypothesis (Shleifer and Vishny, 2003).

Target firms are also compared with the with acquirer firms using discriminant analysis. The results indicate that target firms are smaller and they are outperformed firms in the stock market with very high price increase in the year prior to acquisition, whereas they have lower liquid assets compared to acquirer firms. On the other hand, we reject the hypothesis that acquirer firms are more profitable than target firms. So target firms engage in an M&A transaction after highly performing years, and big acquirers aim to buy these well performing firms. The finding that the higher the asset change one year prior to acquisition, the higher the probability of being an acquirer firm proves that these firms have engaged in a transaction last year as well. So they are continuously and consistently buying new targets, a sign for adopting inorganic growth as a strategy and also a sign for managerial discretion hypothesis of Marris, (1964) and Mueller (1969). The authors claim that empire building managers undertake acquisitions during stock-market boom, since the willingness of investors to accept new news as good news during boom changes the costs to managers from announcing unprofitable acquisitions.

The last part of this thesis involves an attempt to test whether a target firm and the year of M&A event can be predicted. Three models, logistic regression, decision tree C.5.0 algorithm and neural networks are used for this purpose. In terms of general prediction capability we concluded that target firms can be predicted, whereas timing of acquisition can not be predicted. Among the three models, decision tree did the best prediction in both samples; neural networks, was the

second best and logistic regression was the third. For example using decision tree based on hold-out sample results, 93% of the cases can be correctly classified. Correct classification of acquisition cases is 50%, which normally was 7% in the data. Correct prediction of non-acquisition cases yield 94%, which normally was 93%. So we can increase prediction power in predicting acquisition cases without sacrificing non-acquisition case correct prediction percentage. The models show that, the bigger the size (measured by total assets, enterprise value and sales), the higher the stock market valuation (measured by P/E ratio and P/E ratio change), the higher the profitability (measured by Tobin's q), the higher the growth in profitability (measured by net profit change), the higher the leverage (measured by net debt), the higher is the probability of being acquired. These are in line with differences between target and non-target firms analysis.

In sum, our study contributes to the literature about drivers and characteristics of merger and acquisition activity in Turkey during 1998 – 2008 period. Turkey experienced a merger wave in the last four years mainly driven by foreign firms' interest to purchase domestic assets. Foreign acquirers purchased relatively larger in size firms mainly from the same industry. Foreign acquirers also purchased relatively less shares than domestic acquirers because of local partner need. In line with the increased private equity or investment type of acquisitions after 2005, the diversified acquisitions and minority shareholding acquisitions increased after 2005. In terms of domestic acquisitions, with the ease of positive macroeconomic outlook and increased capital market liquidity, domestic acquirers with high current assets purchased high performing, having high return on assets and promising Turkish firms with a financing need. On the target firm side, they sold their highly priced shares to foreign and domestic bidders.

In line with overvaluation hypothesis and other behavioral theories, stock market index is the main determinant of M&A activity in Turkey. However, presence of capital market liquidity is also important to propagate a wave.

This study also has an important finding about stock market reaction to acquisitions, since none of the prior theories or findings are in line with Turkish case. Turkish market only reacts to bid price, and nothing else related to deal characteristics, such as origin of acquirer, purchasing of majority right, medium of payment, whether the deal is diversifying or related acquisition . Also, despite other country evidence in the literature, stock market reaction to an acquisition is weak, even negative following one month of acquisition, which may be a sign for insider trading. We therefore think that the stock market in Turkey does not consider and price any fundamentals related deal, rather more speculative behavior is prevailing in reactions to M&A activities. Moreover, standard deviations in abnormal returns are high. This finding is again positive evidence against behavioral theories explaining M&A activity, which claim high pre M&A return for targets, high dispersion in returns and low post-return for target shareholders.

Predictive performance of models was impressive, further research on this can be to analyze returns of portfolios established with predictive models. This can have important implications for investors.

All of the findings throughout the study support the behavioral theories explaining M&A activity: The overvaluation hypothesis, musical chair hypothesis and the managerial discretion hypothesis. The positive economic outlook, the stock-market increase and globalization enabled empire building managers to grow inorganically while target firms used the chance to cash their highly valued shares.

The stock market on the other hand did not react strongly to M&A events and neither to deal characteristics.

The main limitation of this study was to find accurate deal information for the Turkish M&A activities. Databases have incomplete data for Turkey especially before 2006 and 2007. However with the increased M&A activity, and the growing business of corporate finance advisory, the quality of data in M&A databases got much better. Therefore any study covering years after 2005 will not suffer from data limitations.

APPENDICES

Appendix A: List of Companies Interviewed

Avea İletişim A.Ş

Türkiye İş Bankası A.Ş

Yapı Kredi Bankası A.Ş.

Koç Holding

Sabancı Holding

Dundas- Unlu Menkul Değerler A.Ş.

Rotshild Istanbul

Petrol Ofisi A.Ş.

Actera Private Equity

Türkven Private Equity

Appendix B: Listed Target Firms in the Sample

Acıbadem Sağlık
Afm Film
Afyon Çimento
Ak Enerji
Akbank
Alternatifbank
Anadolu Efes
Atakule Gmyo
Bossa
Camis Logistik Hizmetleri
Çimentaş
Denizbank
Deva Holding
Doktaş Dokumculuk Ticaret Sanayi As
Efes Sinai Yatırım Holding As
Ege Profil
Ereğli Demir Çelik
Ffk Fon Finansal Kiralama
Finansbank
Fortis Bank
Garanti Bankası
Garanti Securities
İzmir Demir Çelik
İzocam
Kav Danışmanlık
Kent Gıda
Kereviş Gıda
Klimasan Klima
Lüks Kadife
Marshall
Migros
Nuh Çimento
Oysa Çimento A.S.
Petkim
Petrol Ofisi
Ray Sigorta
Şekerbank
T.Demir Döküm
T.ekonomi Bank.
T.Tuborg
Tansas Perakende Magazacılık A.S.
Tesco Kipa
Tire Kutsan
Turkcell
Tüpraş
Usaş
Uzel Makina Sanayii Anonim Şirketi (64.43% Stake)
Yapı Ve Kredi Bank.

Appendix C: Listed Acquirer Firms in the Sample

Acıbadem Sağlık
Ak Enerji
Akbank
Akçansa
Aksigorta
Anel Telekom
Aygaz
Batı Çimento
Borusan Mannesmann
Çimentaş
Çimsa
Doğan Gazetecilik
Doğan Holding
Doğan Yayın Hol.
Enka İnşaat
Ereğli Demir Celik
Ffk Fon Finansal Kiralama
Garanti Bankası
Global Yat. Holding
Koç Holding
Koza Davetiye
Migros
Otokar
Oyak Yatırım Ort.
Pera Yatırım Ort.
Reysaş Lojistik
Sabancı Holding
T.Ekonomi Bank.
Tav Havalimanları
Tire Kutsan
Trakya Cam
Turkcell
Tüpraş
Yapı Ve Kredi Bank.

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