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THE RELATIONSHIP OF EARNINGS AND BOOK VALUES TO EQUITY VALUES: EVIDENCE FROM TURKEY

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Abstract

In this study, we examine factors associated with equity valuation in a newly emerging market, Turkey. In the United States and other developed countries, research indicates that both earnings and book value are important predictors of equity valuation. In Turkey, earnings appear to have information content, but earnings appear to be declining in importance over time. Book value adjusted for inflation has a stronger association with equity values. In the inflationary and risky environment of Turkey, where future value of earnings is quite uncertain, investors may be paying less attention to earnings. Our study also indicates that, overall, earnings and inflation-adjusted book values combined virtually explain almost 75 percent of the variation in equity prices. This is much higher than results using U.S. data where the maximum R^2 for pooled data is 15 percent.

1. Introduction

In the developed world, empirical research finds that earnings and book value can be used to predict firm value. Researchers in the US have examined the association between earnings, book value, and a combination of both with stock prices and have found the relationship to be significant (Ball and Brown, 1968; Ball, 1972; Kaplan and Ross, 1972; Collins and Kothari, 1989; Burgstahler and Dichev, 1997). Ohlson (1995) in a landmark paper modeled the association and thus provided a framework for empirical explorations that were built on by Burgstahler and Dichev (1997) and later researchers.

In this study, we examine the association between earnings and book value with equity prices in the Turkish stock market. Analysis of the Turkish market presents the potential for obtaining insights into valuation in a developing (emerging) market. While an argument could be made that certain factors such as inflation and political and economic consequences of joining the EU make the Turkish market unique, we note that, despite the factors noted above, the Turkish market is still very reflective of developing markets in general. Beim and Calomiris (2001) classify Turkey as an emerging market because of its low per capita income, chronic inflation, thin and immature capital markets, and concentrated financial and industrial sectors; criteria that they use to characterize emerging markets in general.

Although the Istanbul Stock Exchange (ISE), established in 1986, is considered as one of the fastest growing of emerging markets, it is still small relative to the stock markets in developed countries. As Zychowicz et al. (1995) note, potential volatility and inefficiency also characterize the market in that a few large investors can, by their buying or selling activity, significantly influence stock prices. Turkey now is in a state of transformation and has been liberalized on the path to becoming a member of the European Union (EU). In this scenario, it is interesting to examine if the relationships between earnings, book value and equity values that exist in the larger, presumably more efficient, markets will hold in a developing stock market.

In an important study in this area, Burgstahler and Dichev (1997) suggest that equity value is an option style combination of *recursion value* (capitalized expected earnings when the firm recursively applies its current business technology to its resources) and *adaptation value* (the value of the firm's resources adapted to alternative use). They use current earnings as a proxy for recursion value and book value of equity as a proxy for adaptation value. While earnings provides a measure of how the firm's resources are currently used, book value provides a measure of the value of the firm's resources, independent of how the resources are currently used. In particular, they note that when the ratio of earnings/book value is high, earnings is the more important determinant of equity value. This is because, in this scenario, the firm is likely to continue the current way of using resources. When earnings/book value is low, book value becomes the more important determinant of equity value. This is because the firm is more likely to exercise the option to adapt its resources to a superior alternative use.

The objective of this study is to examine the association of recursion value (earnings) and adaptation value (book value of equity) with share prices in an emerging stock market. Our results show that, when the sample is partitioned based on "success", earnings are significantly associated with equity values for successful and middle of the road firms; inflation adjusted book values are significantly associated with equity values for unsuccessful firms. This may indicate that the "adaptation value" component of firm equity value is relatively more important than "recursion value" component for unsuccessful firms whereas the opposite is true for successful firms. Moreover, we found that in a risky business environment, the recursion value generally outweighs the adaptation value in determining the market value of a firm.

Because this study tries to underline the potential factors causing the variation in pricing stocks in different settings, it is imperative to understand the institutional and economic factors behind such differences. Accordingly, our paper is structured as follows. A detailed analysis of the unique institutional and economic characteristics of Turkey is provided and the results are discussed against this backdrop. The next section provides a brief history of the evolution of the Turkish stock market commencing in the period after the First World War as well as the institutional and environmental factors of Turkey. Section three discusses fundamental characteristics of the accounting treatments in Turkey. This is important because any differences in results could be attributed to differences in accounting treatments. Thus, a critical examination of key differences and similarities is essential. The fourth section discusses prior studies. The fifth section discusses the methodology and we conclude with a discussion of the results in section six.

2. Institutional and Economic Characteristics of Turkey

In this section we summarize the history of the Turkish stock market (refer to Appendix for a more elaborate discussion). In the period after World War One, Turkish government policy was characterized by an orchestrated economic development strategy popularly referred to as Etatism. This followed a similar pattern adopted in a number of developing countries (Okyar, 1965). This "planned development" period was primarily characterized by the introduction of incentive schemes to foster private enterprise. The private sector flourished with the aid of extensive government protection (e.g., entry barriers, high tariffs for foreign products) and incentive schemes (e.g., subsidized lending, tax exemptions among others). Barth and Hemphill (2000) note that, due to such incentive schemes, the private sector contributed a little more than half of the

value added on manufacturing. Within this closed economic and financial environment, a number of giant industrial holdings emerged. These holdings tended to be predominantly family-owned and had close political and financial ties. Due to entry barriers, scarce internal capital, lack of developed capital markets, and open collusion, these groups have continued to dominate in their respective sectors.[1]

In January 1980, the Turkish government initiated an economic stability program called "*National Economic Policy*", the principal goal being integration with the world economy by establishing a free market. In accordance with this, unified accounting principles and a standard reporting system were adopted and firms began to be audited by independent external auditors in accordance with internationally accepted principles of accounting. Isik and Hassan (forthcoming) note that Turkey's determination to be a permanent member of the EU motivated its authorities to ensure that their regulations were in harmony with those of the union.

The Istanbul Stock Exchange (ISE) was re-established in 1986 to provide liquidity in the financial system.[2] The ISE is the only securities exchange in Turkey established to provide trading in equities, bonds and bills, revenue-sharing certificates, private sector bonds, foreign securities and real estate certificates as well as international securities.[3] The ISE has grown substantially since its inception both in terms of the number of companies listed and total market valuation (please refer Table 1 for details). The number of companies listed in the exchange increased from 350 in 1986 to 1,284 in 1993, but later declined to 743 in 1997. Total market capitalization increased significantly from 938 million dollars in 1986 to approximately 62 billion dollars in 1997. Both the price-earning multiple and dividend yield indicate a decreasing trend for the ISE firms over time, with considerable variation between periods.

[1] The two supposedly rival groups, Koc Holding and Sabanci Holding, are said to have an "understanding and respect" not to intervene in each other's markets for several decades, which, in reality, could be considered to be an open collusion.

[2] In addition to the ISE, the Interbank Money Market (IMM) for Turkish Lira was founded in March 1986. Subsequently, Open Market Operations were started in 1987 and Foreign Exchange and Foreign Banknote Markets were formed in 1989. The Gold Exchange opened its doors in Istanbul in 1995 taking the place of the Central Bank's Gold Market. In 1989 nonresidents were allowed to make purchases on the Istanbul Stock Exchange and Turkish residents were allowed to purchase foreign securities. Despite all these positive changes, financial markets are still incomplete and dominated by banks. Currently, traditional bank loans are still the prevailing source of funds for private firms to finance their short-term working capital needs and long-term projects (Isik and Hassan, forthcoming).

[3] The ISE is supervised by the Capital Market Board (the regulatory and supervisory authority for the Turkish capital markets), which ensures the proper operation of both the ISE and its members and protects the interests of both the public and the investing community.

Money and capital markets in Turkey remain relatively thin and underdeveloped with respect to those in West Europe and North America (Zychowicz et al., 1995; Kiymaz, 2000; Isik and Hassan, 2002). For perspective, the 1992 market capitalization and value traded were about $9.9 billion and $8.2 billion for Turkey, respectively, whereas the same figures were $4,758 billion and $2,679 billion for the U.S.A, $2,399 billion and $635 billion for Japan, and $348 billion and $892 billion for Germany, respectively (Table 2).

The underdevelopment of capital markets in Turkey can be attributed to a variety of factors:

1. Protection from foreign competition
2. Private firms are mostly family owned and relatively small
3. Family controlled firms have no incentives to issue equity to raise capital especially if they own a bank
4. Loans are relatively cheap given the high rate of inflation in the country.

The number of firms whose shares are traded in the stock exchange is limited. In addition, the market is very susceptible to external and internal shocks as reflected by the fact that Turkish shares lost more than 50 percent of their value during the Russian crisis in 1998. Currently, distribution of stock investment is not as wide spread in Turkey relative to more developed markets. This can be attributed to lack of confidence among investors due to lack of effective regulations and inefficiencies in their implementation (Zychowicz et al., 1995; Tracy and Schneider, 2001).

In essence, there are two reasons for the apparent low participation in equity investment in Turkey:

1. The better performance of more secure alternative financial investments. For instance, government debt instruments have been the most lucrative assets in Turkey in recent years. To illustrate, the average real interest rate in the 3-6 month, 6-9 month T-bills and bonds were 9 percent and 27 percent and 43 percent respectively in 1995 (Isik and Hassan, 2002).
2. The intertwined structure of financial and industrial sectors in Turkey. Unlike in the U.S. and Europe, most of the Turkish firms (irrespective of size) are family owned. Large firms prefer traditional bank loans to equity issue as the source of funds because most of the private banks are in one way or another affiliated to these firms under the umbrella of holding company structure.

Finally, the point has to be made that pricing of securities in Turkey may not be as efficient relative to more developed markets such as the United States. Pi and Timme (1993) note that institutional investors (e.g., insurance companies,

pension funds, mutual funds, investment companies) in the more developed countries such as the U.S. contribute to more efficient pricing of securities due to their accumulated knowledge and experience as well as more sophisticated investment analyses. In summary, due to the presence of a relatively greater fluctuating economic environment, high inflation and less sophisticated and complicated investor body, the asset valuation process and factors used to appraise assets are different in the Turkish market relative to a more advanced market such as the United States.

3. Accounting Treatment in Turkey

The Turkish Tax Procedures Code specifies the general methods by which a firm's assets and liabilities are valued. Similar to the U.S., inventory and fixed assets are valued at cost; however, unlike in the United States, Turkish laws allow payables and receivables denominated in Turkish lira to be valued at what is referred to as "carrying value" (market value).[4] According to the Turkish Code, depreciation can be provided on assets that are used in the entity for more than one year, that are subject to wear and tear.

However, unlike the U.S., there are three significant differences. First, Turkish Code allows assets up to 150 million TL to be directly written off as an expense. (In the United States, decisions to write off are governed by the *materiality* concept of Generally Accepted Accounting Principles (GAAP). However, most assets that are considered to be "material" have to be capitalized and shown as an asset). Second, taxpayers in Turkey can also determine the depreciation rate for all their fixed assets, excluding buildings, provided that such rates do not exceed 20 percent on a straight-line basis.[5] Third, and the most important, Turkish firms are allowed to *revalue* the cost of depreciable fixed assets and the related accumulated depreciation by multiplying these values by the rate that is announced each year by the Ministry of Finance. [6] A *revaluation fund* is created for the purpose of ensuring a proper appraisal of the value of the fixed assets that have been adversely affected by inflation.[7] (In the United States, such forms of revaluation for the purpose of valuation for financial reporting are not permissible).

[4] Assets and liabilities denominated in foreign currency are translated using the exchange rate announced by the Ministry of Finance (the buying rate announced by the Turkish Central Bank at the date of valuation), and cash is appraised at nominal value.

[5] Fixed assets that are subject to depreciation at the rates other than this and the applicable rates are announced in the general communiqués issued by the Ministry of Finance.

[6] The Ministry of Finance determines the annual revaluation rate. The rate of revaluation for the year 2000 was 56 %.

[7] Inflation rate has been more than 50% on average for the past two decades although at times it rose above three-digit during crises.

In summary, the main difference between accounting treatments in Turkey and the U.S relate to valuation. As a result of the revaluation process, the value of a fixed asset and its accumulated depreciation are increased commensurate with the rate of revaluation (Activefinans, 2001). At the end of this process, the net revaluation increase of fixed assets is recorded under the shareholders' equity section of the balance sheet as the *revaluation fund* and firms in our sample have a revaluation fund in their stockholder's equity section.

4. Literature Review and Methodology

In general, much research has been conducted in the last thirty years that focused on examining the association between certain variables and equity values. Initially, Ball and Brown (1968) in a seminal study found a positive and statistically significant association between earnings and equity value. Beaver, Clark, and Wright (1979) found similar results and corroborated the initial findings of Ball and Brown. Subsequent studies (Barth et al 1992; Collins and Kothari, 1989) again found similar results. Lipe (1990) found that this relationship varied with the persistence of earnings. Other studies refined the earlier studies by decomposing earnings into components and then empirically testing the association between these components and equity values (Lipe 1986; Wilson 1986).

A number of studies focus on the balance sheet measures of assets and liabilities. These studies find a statistically significant association between book values and equity value of the firm (Landsman 1986; Barth 1991; Shevlin 1991). These studies use the book values of the firm's assets and liabilities, impounding the assumption that measures of assets and liabilities reflect the expected results of future activities. Some studies focused on examining the combination of earnings and book values and their association with equity values. Bernard (1995) empirically tested several valuation models and found that book value per share explained 55 percent of the cross sectional variability in price per share; book value and the rank of return on equity explained 64 percent of the variation in equity price; estimated earnings and book values explained 68 percent of the variation in equity prices. Ohlson (1995) rather than focus on earnings alone, theoretically modeled the relationship of earnings, book value, and dividends in the valuation of a firm's equity. He modeled firm value as a linear, additive function of both earnings and book value. He concluded that, while current dividends are more important than future earnings in predictive ability, current earnings might have a stronger association with equity values than current dividends. Ohlson (1995) laid the theoretical framework for further empirical explorations.

Burgstahler and Dichev (1997) in a further refinement of the Ohlson (1995) study showed that earnings and book value are positively and significantly associated with equity values. However, they found that the relation is non-linear

(i.e., moderated by factors such as success of a firm) and not additive as suggested by Ohlson (1995). In fact, they developed two propositions to investigate the relationship of recursion (proxied by earnings) and adaptation value (proxied by book value of equity) to market value of a firm:

1. Market value is an increasing, convex function of expected earnings, for a given adaptation value,
2. Market value is an increasing, convex function of adaptation value, for given expected earnings.

As mentioned above, Burgstahler and Dichev (1997) found that the extent of association with earnings and book value is dependent on the level of success of the firm. When the firm is "successful," earnings act more as the important determinant of equity value and when the firm is less successful, book value is the more important determinant of equity value (success or lack thereof was defined in terms of an earnings to book value ratio; firms with an earnings to book value above a specified value was deemed successful and firms with less than the specified value were deemed unsuccessful).

There are only a very limited number of studies in accounting and finance journals using the Turkish stock market data. One group of studies investigated the behavior of Turkish stock prices. Yuce (1994), for example, examined the main characteristics of Turkish stock prices in her dissertation and reported that, similar to their U.S. and European counterparts, returns of Turkish stocks were negatively skewed, highly leptokurtic and non-normal. Zychowicz, Binbasioglu and Kazancioglu (1995) explored the behavior of Turkish stock prices in the ISE over the 1988-1992 period. They examined whether stocks in the Turkish stock market conformed to the weak form of market efficiency, which maintains that all past information is reflected to the stock price and investors cannot earn excess returns based on historical information. Zychowicz et al. (1995) examined both daily and seasonal patterns in the ISE returns. They found that daily and weekly returns diverge from the random walk. The behavior of monthly returns was found to be inconsistent with the random walk hypothesis, which implies market inefficiency in pricing securities. These findings are consistent with the previous empirical studies on emerging stock markets. In a recent study, Kiymaz (2000) studied the initial and after-market returns for the Turkish IPOs to provide an emerging market case of international evidence. He found that newly issued shares are under-priced by about 14 percent overall and more specifically, 12 percent for industrials, 15 percent for financials and 19 percent for others; this is consistent with the findings of other international studies on IPOs.

In summary, there is a paucity of research in the international arena using Turkey in general. While published research has focused on the behavior of Turkish stocks there is currently no research that has examined variables that drive equity values in the Turkish environment. Based on previous literature, we developed the following regression equations to investigate the value relevance of earnings and book value of equity in a developing market:

$$P_{i,t}/B_{i,t-1} = \alpha_0 + \beta_1(E_{i,t}/B_{i,t-1}) + \varepsilon_I \quad (1)$$

$$P_{i,t}/B_{i,t-1} = \alpha_1 + \beta_2(B_{i,t}/B_{i,t-1}) + \varepsilon_2 \quad (2)$$

$$P_{i,t}/B_{i,t-1} = \alpha_2 + \beta_3(E_{i,t}/B_{i,t-1}) + \beta_4(B_{i,t}/B_{i,t-1}) + \varepsilon_3 \quad (3)$$

$$P_{i,t}/B_{i,t-1} = \alpha_3 + \beta_5 M + \beta_6 H + \beta_7(E_{i,t}/B_{i,t-1}) + \beta_8 M(E_{i,t}/B_{i,t-1}) + \beta_9 H(E_{i,t}/B_{i,t-1}) + \varepsilon_4 \quad (4)$$

$$P_{i,t}/E_{i,} = \alpha_4 + \beta_{10} M + \beta_{11} H + \beta_{12}(B_{i,t-1}/E_{i,t}) + \beta_{13} M(B_{i,t-1}/E_{i,t}) + \beta_{14} H(B_{i,t-1}/E_{i,t}) + \varepsilon_5 \quad (5)$$

Where:

$P_{i,t}$ is price per share (market value) of equity for firm i at the end of year t

$E_{i,t}$ is the annual earnings per share for firm i in year t

$B_{i,t}$ is book value per share for firm i at the end of year t

L is a dummy variable (1 for Low earnings to book value ratio firms; 0 otherwise; excluded from the equations as the base case)

M is a dummy variable (1 for Medium earnings to book value ratio firms; 0 otherwise)

H is a dummy variable (1 for High earnings to book value ratio firms; 0 otherwise)

ε is a normally distributed error term.

The model in equation 1 examines whether price is positively associated with earnings. The model represented by equation 2 examines whether price is positively associated with book value. The model in equation 3 is labeled the additive form of earnings and book value based on Ohlson (1995), who postulated that firm value is a linear function of both earnings and book value. This equation is also specified in Amir (1996). To be consistent with prior studies, following Bowen (1981), Burgstahler and Dichev (1997) and Bao and Bao (1998), we normalize both the dependent and independent variables in equation 1 through 3 by beginning book value per share. Moreover, we prefer to use $B_{i,\,t-1}$ as the measure of book value of equity (adaptation value) for firm *i* at year *t*, as by definition $B_{i,t}$ contains $E_{i,,t}$ as a component. According to Burgstahler

and Dichev (1997), empirical tests using $B_{i,\ t-1}$ will more clearly separate the effects of earnings (E) and book value of equity (B).[8]

As discussed, Burgstahler and Dichev (1997) developed and tested an alternative model of earnings and book value. They model a firm's value as a combination of its recursion and adaptation value. In order to test their two main propositions given above, we use the models in equation 4 and 5 that represent piece-wise equations and incorporate dummy variables to represent successful (H), unsuccessful (L), and middle of the road firms (M). Therefore, in equation 4 (one test of proposition 1), we hold book value constant by dividing market value and earnings by book value while testing for the incremental effects of earnings. The results from this model can be seen as a test of incremental value relevance of earnings by examining market value per dollar of net assets as a function of earnings per dollar of net assets. Likewise, in equation 5 (one test of proposition 2), we hold earnings constant by dividing market value and book value by earnings while testing for incremental effects of book value. The results from this model can be interpreted as a test of incremental relevance of book value by examining market value per dollar of earnings as a function of net assets per dollar of earnings. In essence, by these two models, Burgstahler and Dichev (1997) maintain that the influence of earnings and book values on equity value is moderated by the financial state of the firm. If the firm is "successful" and is likely to continue in operation, then earnings information will be significantly associated with valuation. However, if a firm is "unsuccessful", then it will attempt to find alternative uses for its resources to survive.[9] For these firms, book value rather than earnings will be a significant determinant influencing valuation of stocks (equity). Similarly, for "middle of the road" firms, equity value will be significantly associated with both earnings and book values. The cutoff points are determined to ensure an equal number of observations in each group using the rankings according to $\boldsymbol{E_{it}/B_{it-1}}$ for equation 4 (Table 7) and $\boldsymbol{B_{it-1}/E_{it}}$ for equation 5 (Table 8). For example, the last two columns in Table 7 give the cutoff points for each period, which define the unsuccessful firms (earnings less than Cutoff1), middle of the road firms (earnings between Cutoff1 and Cutoff2) and successful firms (earnings greater than Cutoff2).

We obtained the data used in this study from the data bank of the Istanbul Stock Exchange (ISE). Following Fama and French (1992), Burgstahler and Dichev (1997), and Bao and Bao (1998) we excluded non-financial firms as well as firms with negative book value of stockholders' equity. In addition, some firms were deleted because of missing share performance information. The frequency of our data is semiannual and extends from the second half of 1992 to the second half of 1997. [10] The firms making up our sample are all traded in the National Market section of the ISE. Our panel data consists of a total of 1,507 observations of Turkish industrial firms for eleven time periods.

We compute the regressions using least squares. As proposed by White (1980), we compute a consistent estimate of the covariance matrix allowing for heteroskedasticity. It should be noted that the coefficients themselves do not change, only their standard deviations. Further, in order to control for distorted results due to possible extreme observations, we omitted any observation for which the residual was larger than three standard deviations for each of the five models. This ensures that the results discussed below are not driven by outliers.

5. Empirical Results

Table 3 provides descriptive statistics of the firms used in this study. As can be observed, the number of observations generally increases over time from 98 in the first half of 1993 to 186 in the second half of 1997. The market to book value ratio exhibits wide fluctuations across firms and across time as evidenced by high standard deviation values and substantial changes in the mean values across periods. Average earnings as a percentage of book value also demonstrates large variations over the sample period, ranging from 46 percent to 119 percent. One interesting observation is that average earnings scaled by book value in Turkey is substantially higher than in more advanced countries. For instance, average earnings as a percentage of book value between 1992 and 1994 for Turkish firms was 69 percent, while the average earnings for U.S. firms was 4 percent. This wide difference in earnings may be a reflection of the degree of *business risk* associated with the two different environments.[11] Alternatively, this earnings difference may be a result of the degree of *competition* in the two different markets. The environment in the U.S. is more competitive and open, as firms have to compete not only with many domestic rivals but also with many foreign competitors, thus making it difficult for U.S. firms to earn above competitive market returns.[12] The business environment in Turkey, however, is closed and less competitive, as the Turkish firms are protected from internal and external competition with extensive regulation and entry barriers. Moreover, the industrial

[8] Like Burgstahler and Dichev (1997), we alternatively used $\mathbf{B_{i,t}}$ for robustness and sensitivity check. We found that the results are qualitatively similar.

[9] As mentioned, "success" or vice versa is defined in terms of an earnings to book value ratio.

[10] We use semi-annual data because that enables us to observe firm or price behavior more frequently. This is critical in an environment that is vulnerable and susceptible to macro-economic fluctuations. However, most of the variables that are used in this study relate to market value and book value of stocks. In addition, the earnings variables are annualized, thus, our data are comparable to the annual figures used in earlier studies.

[11] On average, the annual variation in earnings in the U.S. was 11 % between 1976 and 1994 (Burgstahler and Dichev, 1997), while it was approximately 131% in Turkey between 1992 and 1997.

[12] For example, the automotive manufacturing firms in the US face stiff competition from foreign firms in their home market. Evidently, the share of foreign automakers in the US began to level with that of the US automakers as of 2001.

sectors in Turkey are highly concentrated and controlled dominated by a few very large firms; the typical characteristics of an oligopolistic market that give firms market power to record abnormal profits.

Table 4 contains coefficient estimates for the simple linear form relating $P_{i,t} / B_{i,t-1}$ to $E_{i,t} / B_{i,t-1}$ (equation 1). Results are presented for regressions conducted for the years 1992 to 1997. Results are also presented for a pooled regression with all firm/years pooled together. As shown in Table 4, the coefficient on earnings is significant for all the years and the pooled regression. This suggests that, in Turkey, earnings are important in terms of information content and are significantly associated with equity prices. However, as can be observed from the table, the value of the coefficient declines, as we move to more recent periods. This decline may suggest that, either the constraint imposed by the simple linear form may have become less appropriate over time, or alternatively, the importance of earnings decreased in later years. Turkey experienced an intense economic crisis in 1994 that caused the GNP to shrink by 6 percent, a record level of annual output loss in the history of the country up to that date. Turkish Lira lost more than 50 percent of its value against the $US in the first quarter of 1994, which hurt the firms that carried substantial amounts of hard-currency denominated borrowed funds from external and internal financial markets. This crisis was an important early warning signal and the precursor for subsequent crises that occurred in 1997-1998, and more recently in November 2000 and February 2001; crises that necessitated the international bailout of the Turkish economy (Isik and Hassan, 2000). As Turkish firms began to operate in an increasingly risky environment characterized by greater threats to survival, the Turkish investors may be focusing less on the "recursion value" component of a firm's value (present value of future earnings under the assumption that the firm continues to survive) and more to the "adaptation value" component (the liquidation value of the firm's resources when it is adapted to alternative uses). Changes in the Turkish environment during this period give credence to the results.

Table 5 contains estimates of the coefficients for the simple linear form relating $P_{i,t} / B_{i,t-1}$ to $B_{i,t} / B_{i,t-1}$ (equation 2). The results are again presented for the same years. The book values are reported values that had been adjusted for inflation rates in Turkey (This holds for all equations). As shown in Table 5, the coefficient for book value is significant in all the years and the pooled regression. This indicates that book value adjusted for inflation is significantly associated with equity value for the time period under study. Interestingly, the estimates in Table 5 indicate that book value adjusted for inflation has a stronger association with equity value than earnings. In the inflationary environment of Turkey, inflation adjusted book value seems to be more important to investors in assessing equity value. As Burgstahler and Dichev (1997) note, within a volatile business environment, the adaptation value (the current value of the firm's resources independent of its business technology) may become more important than the recursion value (how well firms currently apply their current business technology to their resources). As discussed above, since it is relatively more difficult to determine the market value of an asset by projecting future earnings in an unstable financial environment than the stable one, the Turkish investors may be weighing the *current* value of the assets more than their *potential* value. In a turbulent environment where firm failures are common, it appears that investors pay less attention to future earnings that may not be realized. Also, to an extent, inflation accounting through revaluation funds flattens out the differences between market value and book value. The average adjusted R^2 for the model in Table 5 (67 percent) is also greater than that of the model in Table 4 (60 percent), indicating a stronger association between inflation adjusted book value and equity values.[13]

The value of the firm can be considered as a function of both earnings and book value as the firm has the option to either continue its present activities or adapt its resources to alternative uses. Table 6 contains estimates of the coefficients for the linear form relating $P_{i,t} /B_{i,t-1}$ to $E_{i,t} / B_{i,t-1}$ and $B_{i,t} / B_{i,t-1}$ (equation 3). The results are presented for regressions conducted for the same years. Results are also presented for a pooled regression with all the firm/years pooled together. In Table 6 the coefficients on both earnings and book value are significant for all the years except the second quarter of 1993. While both earnings and book values are individually associated with firm value, they are more powerful in explaining value when combined. This is evidenced by the higher adjusted R^2 of this model (R^2 of 0.723).

The *convexity theory* implies that the marginal effects of the two components of the firm equity value, adaptation value and recursion value, depend on their magnitudes relative to each other (Burgstahler and Dichev, 1997). Table 7 contains estimates of the coefficients for the piece-wise linear form relating $P_{i,t} / B_{i,t-1}$ to $E_{i,t} / B_{i,t-1}$ after controlling for firm "success" (equation 4). Table 8 reports estimates of the coefficients for the linear form relating $P_{i,,t} / E_{i,t}$ to $B_{i,t-1} / E_{i,t}$ after controlling for firm "success" (equation 5).[14] As mentioned earlier, we divided the domains of $E_{i,t}/B_{i,t-1}$ (Table 7) and $B_{i,t-1}/E_{i,t}$ (Table 8) into three groups with equal numbers of observations. For instance in Table 7, the groups were

[13] Traditional bank loans are the major source of funds for firms. Banks focus more on firms' debt paying ability (solvency of the business, i.e., positive net-worth) than on profitability, enhancing the relevance of book values in driving equity values. We thank Dr. D.H. Bao for this insight.

[14] Because it is hard to reach a conclusion based on casual observation, it is essential to conduct a formal test for the convexity of the relationship using the procedures outlined above using Equation 4 and 5. Nevertheless, we depicted the empirical relation between market value and earnings for the entire sample, both scaled by book value lagged by one year. We found that the plot is consistent with the view that market value and earnings are positively associated. It is available upon request from the authors.

identified in the 1992-II period as follows: those with $E_{i,t}/B_{i,t-1}$ less than 0.243 (Cutoff1) to the unsuccessful firms (L), which is excluded from the regressions as the base case, those with $E_{i,t}/B_{i,t-1}$ greater than 0.243 (Cutoff1) but less than 0.577 (Cutoff2) to the middle of the road firms (M) and those with $E_{i,t}/B_{i,t-1}$ greater than 0.577 (Cutoff2) to the successful firms (H). The same grouping procedure is implemented for $B_{i,t-1}/E_{i,t}$ in Table 8.

The intercept and slope coefficients for the middle of the road (β_5 and β_8) and successful firms (β_6 and β_9) were estimated *incremental* to the intercept and slope coefficients of the unsuccessful firms (α_3 and β_7).[15] In doing so, the objective is to test whether the incremental coefficients are equal to zero. Thus, the *t*-statistics given in the tables for the middle of the road (M) and successful firms (H) are for tests of incremental significance relative to the unsuccessful firms group (L). It should be noted however that coefficients reported in the tables are the *total* intercept and slope coefficients for the group M ($\alpha_3 + \beta_5$ for the intercept and $\beta_7 + \beta_8$ for the slope) and the total coefficients for the group H ($\alpha_3 + \beta_6$ for the intercept and $\beta_7 + \beta_9$ for the slope). Therefore, t_8 shown in Table 7 is the relevant t-statistic for testing whether the difference between the slope coefficients of the middle of the road (M) and unsuccessful firms (L) is significant (i.e., whether β_8 is zero); t_9 is the relevant t-statistic for testing whether the difference between the slope coefficients of the successful (H) and unsuccessful firms (L) is significant (i.e., whether β_9 is zero).

As the results in Table 7 indicate, there is a significant positive relationship between scaled market value and scaled earnings (β_7 is significantly different from zero and positive). This finding supports the value relevance of earnings. Consistent with the valuation model, the average intercepts of Equation 4 decrease as earnings scaled by book value increase across groups [($\alpha_3 + \beta_6$ = 0.038) < ($\alpha_3 + \beta_5$ = 0.756) < (α_3 = 1.134)]. In addition, the slope coefficients generally increase as we shift from the low earnings group to high earnings group as also predicted by the convexity theory [($\beta_7 + \beta_9$ = 22.523) > ($\beta_7 + \beta_8$ = 17.103) > (β_7 = 14.049)]. Moreover, the results indicate that the slope coefficient for the successful firms group (β_9) is significantly greater than that of the middle of the road firms group (β_8) in all periods except for 95-II and 96-II. Also, the explanatory power of the model 4 is greater than that of the model 1, implying that the piece-wise linear form fits the data better than the simple linear form.

Table 8 presents the results for the piece-wise function of book value controlling for the level of earnings. For the pooled regression, the intercept is 25.682 for the unsuccessful firms, 12.870 for the middle of the road firms and 10.449 for the successful firms. As the results manifest, for unsuccessful firms, book value is more relevant for valuation of equity because the intercepts decline as the book value rises [($\alpha_4 + \beta_{11}$) < ($\alpha_3 + \beta_{10}$) < (α_4)].[16] Furthermore, consistent with expectations, the slope coefficients uniformly increase across the groups: –1.873 for unsuccessful firms (low BV/E values); 0.456 for the middle of the road firms (medium BV/E vales); and 0.981 for the successful firms (high BV/E values).

The estimated coefficients on earnings and book values are consistent with their theoretical values and the findings of Burgstahler and Dichev (1997) for U.S. firms. However, while the results are surprisingly similar, indicating similar relationships, a significant difference is that the models using Turkish data had much higher adjusted R^2 s than the models in the Burgstahler and Dichev (1997) study. In the case of the first linear model incorporating earnings as the dependent variable, the Burgstahler and Dichev (1997) study reported a mean adjusted R^2 of 0.11 (pooled model 0.15). In this study, using Turkish data, we found a mean adjusted R^2 of 0.49 (pooled model 0.155). In the case of the second linear model using book values, the mean adjusted R^2 in the Burgstahler and Dichev (1997) study was 0.12 (pooled model 0.02); in this study, the mean adjusted R^2 was 0.588 (pooled model 0.596). The stronger results with Turkish data indicate that, while in the U.S., a large number of variables may be influencing or driving equity values, in a developing market such as Turkey, equity values may be driven by very limited variables. In the relatively smaller and less complex capital market of Turkey, the limited disclosure of information to investors as well as small numbers of market participants may be among the plausible reasons underlying this observation.

6. Conclusions

Earnings have been identified as the predominant determinant of firm value in accounting research for the past three decades. Ohlson (1995) modeled firm value is a linear function of *both* earnings and book value. Burgstahler and Dichev (1997) show that firm value is a piece-wise function and not a linear additive function of both earnings and book value. All the major studies focused on U.S firms. The United States is characterized by a strong well-established stock market with a multiplicity of investors, none of whom can individually influence stock price. In this study, we examined whether earnings and book value have a similar relationship in the Turkish stock market that possesses significantly different characteristics. Turkey is currently an emerging market that has adopted liberal policies in the last two decades. The stock market has fewer firms relative to the United States. It is also relatively inefficient in that a few large investors can, by their buying or selling activity, significantly influence stock prices. Another significant difference between the two markets relates to

[15] This procedure closely follows the treatment of Burgstahler and Dichev (1997).

[16] The signs of the relationship in Table 7 and 8 are generally in line with the theory but the relationships are weak in a few cases.

accounting methods. This is an artifact of the high rates of inflation in Turkey. In particular, assets in Turkey are valued at "current cost" after taking account of inflation. This is significantly different from the United States where assets are valued at historical cost.

The purpose of this research is to examine whether the association between book value and earnings to equity value holds in this very different environment. We found that the relationships do hold true in Turkey, but the *degree* of the relationships substantially differs. Overall, in Turkey earnings do have information content and are relevant in predicting equity values (after controlling for book values). However, the importance of earnings as a predictor of equity values appears to be declining. Book value, adjusted for inflation, has a stronger association with equity value. This may be explained by the fact that in the inflationary environment of Turkey, it is more difficult to determine market value by projecting future earnings. In an inflationary environment in which book value of earnings is quite uncertain, investors may be paying less attention to earnings. Turkish investors may well be applying this criterion. Alternatively, the adjustment of firm assets for inflation in Turkey may not have allowed book value of assets to deviate from market value of assets to a great extent. However, in countries that do not adopt this accounting treatment (U.S., for example) book value information is based on primarily historical cost, which has little association with contemporaneous market prices (Burgstahler and Dichev, 1997). Within this accounting environment, book value becomes largely independent of the success with which the firm currently employs its resources.

Overall, the economic rationale for our finding of a higher association between book values and equity values in Turkey relative to the U.S may be attributed to significantly different levels of inflation in both countries and significantly different perceptions of risk. In the relatively free inflation environment of the U.S., assets and liabilities are not required to be adjusted for inflation. In this environment, market values may diverge significantly from book values causing book values to be less meaningful. Turkey is characterized by high inflation rates. As mentioned above, in Turkey reported asset values have to be at current rather than historical cost. All values are adjusted for inflation prior to incorporation in the Balance Sheet. In this environment, book values may not diverge significantly from market values. Thus, reported book values may have greater meaning to Turkish investors relative to American investors.

The results also indicate that both earnings and inflation-adjusted book values have significant association with equity value. Combined, they have a very strong association with equity values. Finally, as in the U.S., when the sample is partitioned, we found that earnings are more relevant for valuation of equity of successful firms while book value is more relevant for valuation of equity of unsuccessful firms. This is consistent with the findings of Burgstahler and Dichev (1997). In conclusion, the models using Turkish data have a higher adjusted R^2 than for studies conducted with U.S. firms. This may indicate that in this developing market only a few variables are used to determine equity values.

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Table 1: The number of listed firms and market valuation in the Istanbul Stock Exchange (1986-97)

Year	# of firms	Market Valuation (in $ US million)						
		Total Market	National Market	Regional Market	New Market	Watch List M.	P/E Ratio ($)	Dividend Yield %
1986	350	938	938	---	---	---	---	9.15
1987	414	3125	3125	---	---	---	---	2.82
1988	556	1128	1128	---	---	---	---	10.48
1989	730	6756	6756	---	---	---	---	3.44
1990	916	18737	18737	---	---	---	---	2.62
1991	1092	15564	15564	---	---	---	---	3.95
1992	1238	9922	9922	---	---	---	---	6.43
1993	1284	37824	37824	---	---	---	14.86	1.65
1994	1204	21785	21785	---	---	---	10.97	2.78
1995	922	20781.62	20564.75	216.87	---	---	5.479	3.56
1996	788	30797.22	30329.21	376.92	61.12	29.97	7.71	2.87
1997	743	61879.26	61348.09	410.14	73.35	47.68	13.28	1.56

Notes: There are four sub-markets in the Istanbul Stock Exchange (ISE). The "National Market" is the largest market, which includes all companies that fulfilled the listing requirements pre-determined by the ISE. The "Regional Markets" consist of companies de-listed temporarily or permanently from the ISE's National Market as well as companies that fail to fulfill the listing requirements and lack the necessary qualifications for trading on the ISE's National Market. The "New Companies Market" was formed in order to enable young companies with growth potential to offer their stocks to the public via the ISE, which enables trading of such stocks in an organized market. The "Watch List Companies Market" consists of the companies under special surveillance and investigation due to extraordinary situations with respect to stock transactions and/or companies traded on the ISE; disclosure of incomplete, inconsistent and/or untimely information to the public; failure to comply with the existing rules and regulations as well as other situations leading to de-listing of stocks and/or dismissal from the related market temporarily or permanently in order to protect investors' rights and public interest. P/E ratio stands for price-earning ratio denominated in US dollars. Dividend yield is simply average annual dividend payment divided by average closing price for the firms traded in the National Market segment of the ISE (Source: The Istanbul Stock Exchange (ISE), Istanbul, Turkey).

Table 2: Market Capitalization and Value Traded (millions of $U.S.)

Stock Market	Market Capitalization	Value Traded
Argentina	18,633	15,679
Austria	21,750	9,862
Finland	12,202	2,293
Germany	348,138	892,037
Greece	9,489	1,605
Hong Kong	172,106	90,611
India (Bombay)	65,119	20,597
Iran	1,157	225
Jamaica	3,227	386
Japan	2,399,004	635,261
Korea	107,448	116,101
Philippines	13,794	3,104
Portugal	9,213	3,455
TURKEY	9,922	8,191
United States	4,757,879	2,678,523

Source: International Finance Corporation – 1992 data (adapted from Zychowicz et al., 1995)

Table 3: Summary Statistics of the Turkish firms' market value (P_t), earnings (E_t) and book value (B_t) scaled by book value (B_{t-1}) between 1992-II and 1997-II

Period	# of firms	Market Value (P_{it}/B_{it-1})		Earnings (E_{it}/B_{it-1})		Book Value (B_{it}/B_{it-1})	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
92-II	107	3.41	3.71	0.46	0.37	1.33	0.59
93-I	98	24.29	137.21	1.14	5.70	4.32	20.17
93-II	124	14.47	30.09	0.92	1.85	2.37	4.18
94-I	103	8.58	17.30	0.70	0.76	1.31	2.69
94-II	116	25.48	59.15	1.19	1.87	3.39	9.16
95-I	137	17.16	67.36	0.86	1.18	3.16	12.95
95-II	142	7.26	7.73	0.65	0.49	1.17	1.06
96-I	153	6.17	7.09	0.74	0.64	1.32	2.05
96-II	165	11.93	15.30	0.70	0.53	2.55	7.71
97-I	176	12.37	43.65	0.74	0.78	2.43	8.95
97-II	186	19.29	33.06	0.69	0.53	2.25	4.30
Mean	137	13.67	38.33	0.80	1.34	2.33	6.71
Pooled	1507	13.57	49.34	0.79	1.31	2.29	8.36

Notes: The definition of the variables used in the table are as follows: $P_{i,t}$ is price per share (market value) of equity for firm i at the end of year t; $E_{i,t}$ is the annualized earnings per share for firm i in year t; $B_{i,t}$ is book value per share for firm i at the end of year t. Following Bowen (1981), Burgstahler and Dichev (1997) and Bao and Bao (1998), the variables are normalized by beginning book value per share.

Table 4: Market value of Turkish firms as a function of earnings (1992-II/1997-II). Model 1: $Pi,t/Bi,t-1 = \alpha 0 + \beta 1 Ei,t/Bi,t-1 + \varepsilon I$

Period	α_0	$t_{\alpha 0}$	β_1	t_1	R^2
92-II	1.800	1.319***	10.156	10.932***	0.913***
93-I	1.708	2.659***	13.537	10.460***	0.936***
93-II	0.749	0.946	15.571	17.034***	0.925***
94-I	1.832	1.468	14.887	3.415***	0.362***
94-II	-0.894	-0.302	20.457	4.526***	0.508***
95-I	-3.896	-1.206	35.957	3.227***	0.464***
95-II	1.635	2.204**	7.544	5.363***	0.414***
96-I	1.338	2.683***	10.661	6.926***	0.444***
96-II	-1.023	-0.755	16.354	6.621***	0.564***
97-I	-3.467	-2.705***	29.851	6.832***	0.699***
97-II	1.209	1.971**	14.694	3.484***	0.372***
Mean	0.090	0.753	17.243	7.165	0.600
Pooled	5.822	3.298***	9.357	2.891***	0.155***

Notes: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels respectively. $P_{i,t}$ is price per share (market value) of equity for firm i at the end of year t; $E_{i,t}$ is the annualized earnings per share for firm i in year t; $B_{i,t}$ is book value per share for firm i at the end of year t. Following Bowen (1981), Burgstahler and Dichev (1997) and Bao and Bao (1998), the variables are normalized by beginning book value per share. The above model (equation 1) examines whether price is positively associated with earnings. Thus, Table 4 contains estimates of the coefficients for the simple linear form relating $P_{i,t} / B_{i,t-1}$ to $E_{i,t} / B_{i,t-1}$. Results are presented for regressions conducted semi-annually for the years 1992 to 1997.

Table 5: Market value of Turkish firms as a function of book value (1992-II/-1997-II). Model 2: Pi,t/Bi,t-1 = α1 + β2Bi,t/Bi,t-1 + ε2

Period	α_1	$t_{\alpha 1}$	β_2	t_2	R^2
92-II	3.639	4.565***	2.265	10.375***	0.903***
93-I	2.053	2.981***	2.087	71.137***	0.974***
93-II	-1.777	-1.682*	6.883	11.685***	0.929***
94-I	0.288	0.550	5.167	27.459***	0.893***
94-II	6.574	2.944***	4.848	3.501***	0.405***
95-I	3.050	2.276**	3.991	3.064***	0.385***
95-II	2.868	4.893***	3.079	6.868***	0.337***
96-I	2.615	6.983***	2.147	8.205***	0.609***
96-II	7.571	9.926***	1.122	4.557***	0.497***
97-I	3.796	5.202***	2.460	17.117***	0.844***
97-II	6.727	6.681***	3.637	12.602***	0.591***
Mean	3.400	4.120	3.426	16.052	0.670
Pooled	4.219	7.770***	3.220	9.519***	0.596***

Notes: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels respectively. $P_{i,t}$ is price per share (market value) of equity for firm *i* at the end of year *t; $E_{i,t}$* is the annualized earnings per share for firm *i* in year *t; $B_{i,t}$* is book value per share for firm *i* at the end of year *t.* Following Bowen (1981), Burgstahler and Dichev (1997) and Bao and Bao (1998), the variables are normalized by beginning book value per share. The above model (equation 2) examines whether price is positively associated with book value. Accordingly, Table 5 contains estimates of the coefficients for the simple linear form relating $P_{i,t} / B_{i,t-1}$ to $B_{i,t} / B_{i,t-1}$. The results are presented semi-annually for the 1992-97 period. The book values are adjusted for inflation according to revaluation rates published by the Ministry of Finance of Turkey.

Table 6: Market value of Turkish firms as a function of earnings and book value (1992-II/1997-II). Model 3: Pi,t/Bi,t-1 = α2 + β3Ei,t/Bi,t-1 + β4Bi,t/Bi,t-1 + ε3

Period	α_2	$t_{\alpha 2}$	β_3	t_3	β_4	t_4	R^2
92-II	1.380	2.218**	6.839	7.613***	-0.967	-1.843*	0.609***
93-I	1.479	4.103***	16.117	4.378***	-0.217	-0.408	0.993***
93-II	-1.244	-2.378**	12.700	6.289***	1.853	2.352**	0.967***
94-I	-1.446	-1.176	6.442	1.469	5.085	17.888***	0.873***
94-II	-0.944	-0.268	14.284	2.699***	2.039	1.315	0.612***
95-I	-2.151	-1.854*	18.448	4.914***	2.990	2.760***	0.634***
95-II	0.480	0.855	5.687	5.328***	2.015	4.834***	0.533***
96-I	0.319	0.699	7.773	4.876***	1.967	9.054***	0.690***
96-II	-1.345	-1.172	13.772	6.793***	1.042	12.901***	0.744***
97-I	-2.653	-2.143**	19.404	4.696***	2.258	21.130***	0.932***
97-II	-3.778	-1.599	18.964	3.828***	2.868	7.722***	0.669***
Mean	-0.900	-0.247	12.766	4.808	1.903	7.064	0.751
Pooled	-0.619	-1.377	10.968	9.890***	2.612	11.077***	0.723***

Notes: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels respectively. $P_{i,t}$ is price per share (market value) of equity for firm *i* at the end of year *t; $E_{i,t}$* is the annualized earnings per share for firm *i* in year *t; $B_{i,t}$* is book value per share for firm *i* at the end of year *t.* Following Bowen (1981), Burgstahler and Dichev (1997) and Bao and Bao (1998), the variables are normalized by beginning book value per share. The above model (equation 3) is labeled the additive form of earnings and book value based on Ohlson (1995), who postulated that firm value is a linear function of both earnings and book value. This equation is also specified in Amir (1996). The table contains estimates of the coefficients for the linear form relating $P_{i,t} / B_{i,t-1}$ to $E_{i,t} / B_{i,t-1}$ and $B_{i,t} / B_{i,t-1}$. The results are presented for regressions conducted semi-annually for the period from 1992 to 1997. Results are also presented for a pooled regression with all the firm/years pooled together (the last row above).

Table 7: Market value of Turkish firms as a function of earnings with dummy variables to represent successful and middle of the road firms (1992-II/1997-II). Model 4: Pi,t/Bi,t-1 = α3 +β5 M + β6 H + β7(Ei,t/Bi,t-1)+β8 M (Ei,t/Bi,t-1)+β9 H(Ei,t/Bi,t-1)+ε4

Period	α_3	$t_{\alpha 3}$	$\alpha_3+\beta_5$	t_5	$\alpha_3+\beta_6$	t_6	β_7	t_7
92-II	0.824	2.735***	-0.046	-2.013**	-0.011	-1.756*	3.171	2.149**
93-I	0.787	2.543***	0.559	-0.213	0.124	-2.196**	11.191	2.462***
93-II	1.169	2.218**	1.152	-0.486	-1.759	-3.096***	12.896	5.662***
94-I	0.837	2.317**	0.832	-0.002	0.263	-1.678*	8.896	2.238**
94-II	1.874	1.657*	1.780	-0.834	1.229	-1.241	14.128	3.394***
95-I	1.279	3.460***	-1.661	-3.583***	-1.762	-3.799***	29.100	4.030***
95-II	1.287	3.644***	2.532	1.588*	2.735	1.702*	13.611	4.421***
96-I	0.528	1.047	-0.386	-0.233	-0.061	-2.273**	10.910	2.754***
96-II	1.467	4.797***	-0.116	-3.502***	-0.777	-4.470	13.146	4.705***
97-I	1.227	2.468**	2.660	2.189**	2.704	2.910***	15.099	3.088***
97-II	1.191	1.981*	1.013	-0.631	-2.268	-6.436***	12.389	0.673
Mean	1.134	2.625	0.756	-0.702	0.038	-2.030	14.049	3.234
Pooled	1.216	1.982**	1.183	-1.113	0.162	-1.659*	12.857	3.805***

Table 7: Cont'd.

Period	$\beta_7+\beta_8$	t_8	$\beta_7+\beta_9$	t_9	R^2	*Cutoff1*	*Cutoff2*
92-II	6.062	2.133**	8.121	2.922***	0.561***	0.243	0.577
93-I	16.073	4.433***	18.481	7.724***	0.983***	0.282	0.544
93-II	15.428	1.873	26.897	5.479****	0.911***	0.323	0.740
94-I	11.589	0.293	12.046	0.407	0.198	0.368	0.794
94-II	11.843	-0.183	19.402	0.722	0.269**	0.530	0.948
95-I	39.553	8.023***	42.139	9.559***	0.910***	0.428	0.824
95-II	18.034	3.880***	14.711	2.125**	0.428***	0.341	0.838
96-I	19.031	3.611***	19.458	3.333***	0.417***	0.448	0.800
96-II	21.180	0.575	20.592	1.284	0.473***	0.421	0.751
97-I	18.294	2.786***	25.783	4.767***	0.663***	0.382	0.782
97-II	11.056	-0.068	40.131	1.171	0.302***	0.415	0.863
Mean	17.103	2.487	22.523	3.590	0.556	0.380	0.769
Pooled	16.156	2.167**	19.177	2.269**	0.518***	0.328	0.664

Notes: $P_{i,t}$ is price per share (market value) of equity for firm i at the end of year t; $E_{i,t}$ is the annualized earnings per share for firm i in year t; $B_{i,t}$ is book value per share for firm i at the end of year t. Following Bowen (1981), Burgstahler and Dichev (1997) and Bao and Bao (1998), the variables are normalized by beginning book value per share. The table contains estimates of the coefficients for the linear form relating $P_{i,t}/B_{i,t-1}$ to $E_{i,t}/B_{i,t-1}$ after controlling for firm "success" . The samples were classified into successful (H), middle of the road (M), and unsuccessful firms (L). Unsuccessful firms (L) are excluded from the regressions as the base case. The cutoff points for this classification are determined in a way that there will be an equal number of observations in each group using the rankings according to $E_{i,t}/B_{i,t-1}$. The cut-off points for the respective years are given in the last two columns. Accordingly, the unsuccessful firms (L): firms with $E_{i,t}/B_{i,t-1}$ less than Cutoff1, middle of the road firms (M): firms with $E_{i,t}/B_{i,t-1}$ between Cutoff1 and Cutoff2, and successful firms (H): those with $E_{i,t}/B_{i,t-1}$ greater than Cutoff12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels respectively. All t-statistics are calculated based on the heteroskedasticity-consistent covariance matrix (White, 1980). The t-statistics for the groups H and M are the t-statistics for tests of the hypothesis that the coefficients for the H and M group firms are significantly different from the corresponding coefficient for the L group.

Table 8: Market value of Turkish firms as a function of book values with dummy variables to represent successful and middle of the road firms (1992-II/1997-II). Model 5: Pi,t /Ei,t = α4 +β10 M + β11 H + β12(Bi,t-1/Ei,t)+β13M(Bi,t-1/Ei,t)+β14H(Bi,t-1/Ei,t)+ε5

Period	α_4	$t_{\alpha 4}$	$\alpha_4+\beta_{10}$	t_{10}	$\alpha_4+\beta_{11}$	t_{11}	β_{12}	t_{12}
92-II	9.015	3.367***	2.765	-1.624*	2.645	-2.123**	-0.945	-1.269*
93-I	23.090	4.540***	11.816	-5.614***	13.488	-5.065***	-0.389	-0.267
93-II	13.822	5.625***	11.938	0.938	10.694	1.099	-0.621	-0.436
94-I	15.269	1.536	6.940	-2.205**	4.702	-4.867***	-4.105	-3.785***
94-II	19.918	2.379***	8.355	-3.907***	7.626	-3.261***	-2.936	-2.521***
95-I	53.032	2.589***	22.878	-4.262***	29.303	-2.134**	-1.933	-2.641***
95-II	9.363	1.763*	5.677	-0.632	12.484	0.565	1.436	0.356
96-I	19.040	3.994***	18.242	-0.059	13.454	-1.089*	-2.856	-1.942**
96-II	16.185	2.633***	14.924	-0.105	1.853	-5.897***	1.023	0.239
97-I	29.478	4.642***	9.542	-2.034**	15.929	-2.083**	-4.328	-3.511***
97-II	45.486	3.079***	32.611	-0.528	30.981	-0.936	-2.524	-1.619*
Mean	23.063	3.286	13.244	-1.821	13.044	-2.345	-1.653	-1.581
Pooled	25.682	6.297***	12.870	-2.496**	10.499	-2.742**	-1.873	-1.646*

Table 8: Cont'd.

Period	$\beta_{12}+\beta_{13}$	t_{13}	$\beta_{12}+\beta_{14}$	t_{14}	R^2	*Cutoff1*	*Cutoff2*
92-II	2.012	2.431***	2.628	1.967**	0.542***	3.834	8.354
93-I	-0.109	1.283	0.056	1.211	0.681***	3.905	7.280
93-II	-0.012	1.254	1.248	2.663***	0.489***	3.032	6.192
94-I	1.658	2.845***	1.212	1.856**	0.728***	2.522	5.444
94-II	2.051	4.429***	2.433	2.569***	0.811***	2.092	3.800
95-I	-0.772	1.361	-0.251	1.637*	0.747***	2.428	4.791
95-II	3.365	2.101**	2.142	1.329	0.521***	2.372	5.852
96-I	-0.056	1.331	0.423	1.601*	0.734***	2.454	4.456
96-II	0.083	-0.221	1.446	1.191	0.683***	2.612	4.814
97-I	1.569	1.801*	0.910	1.701*	0.887***	2.560	5.229
97-II	-0.006	1.949**	0.843	1.982**	0.341***	2.318	4.816
Mean	0.889	1.869	1.190	1.792	0.651	2.739	5.548
Pooled	0.456	1.972**	0.981	1.678*	0.615***	2.379	4.818

Notes: $P_{i,t}$ is price per share (market value) of equity for firm i at the end of year t; $E_{i,t}$ is the annualized earnings per share for firm i in year t; $B_{i,t}$ is book value per share for firm i at the end of year t. Following Bowen (1981), Burgstahler and Dichev (1997) and Bao and Bao (1998), the variables are normalized by beginning book value per share. The table contains estimates of the coefficients for the linear form relating $P_{i,t}/B_{i,t-1}$ to $B_{i,t}/B_{i,t-1}$ after controlling for firm "success" . The samples were classified into successful (H), middle of the road (M), and unsuccessful firms (L). Unsuccessful firms (L) are excluded from the regressions as the base case. The cutoff points for this classification are determined in a way that there will be an equal number of observations in each group using the rankings according to $B_{i,t}/B_{i,t-1}$. The cut-off points for the respective years are given in the last two columns. Accordingly, the unsuccessful firms (L): firms with $B_{i,t}/B_{i,t-1}$ less than Cutoff1, middle of the road firms (M): firms with $B_{i,t}/B_{i,t-1}$ between Cutoff1 and Cutoff2, and successful firms (H): those with $B_{i,t}/B_{i,t-1}$ greater than Cutoff12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels respectively. All t-statistics are calculated based on the heteroscedasticity-consistent covariance matrix (White, 1980). The t-statistics for the groups H and M are the t-statistics for tests of the hypothesis that the coefficients for the H and M group firms are significantly different from the corresponding coefficient for the L group.

Appendix

Review of Developments in the Turkish Market: Period after World War 1 to the 1930s

Event

First National Economic Congress held in Izmir in 1923. The purpose was to address a large number of economic issues that Turkey would have to overcome.

Result

Congress recommended that specialized banks should be formed to finance the main sectors of the economy. The state established six public banks in the 1930s including the Central bank (Denizer, 1997). This government orchestrated economic development policy (known as Etatism), which followed a pattern similar to that adopted in other developing countries (Okyar, 1965).

Period 1930s to the Late 1970s

Event

Continuation of the planned development phase (i.e., a protectionist and closed economic environment); strong incentive scheme to foster private enterprise (including directed credit programs, subsidized lending, tax exemptions, investment credits, entry barriers and high tariffs and customs for foreign firms and products).

Result

- Private sector flourished and contributed a little more than half of the value added in manufacturing by the 1970s (Barth and Hemphill, 2000)
- Creation of a number of giant industrial holdings that have seized control in several sectors (Sabanci, Koc, Has Dogus, Cukurova, Yasar, Uzan, Toprak, Colakoglu, Cingilloglu). This is mainly attributed to entry barriers, scarce internal capital, lack of developed money and lack of adequate capital markets.

Event

Implementation of the Glass-Steagal Act.

This act prohibits any equity ownership by U.S banks.

Result

Lack of foreign penetration and control dominated by local firm management.

Late 1970s to the 1980s

Event

Economic stability program entitled "National New Economic Policy" implemented. Principal aim was integration with the world economy by establishing a free market economy.

Result

- New firm entries from inside and outside of the county now encouraged.
- Free trade zones established.
- Liberalization of commodity prices.
- Privatization of state economic enterprises

Event

As a reflection of liberal policies, unified accounting principles and a standard reporting system were adopted.

Result

Firms now audited by independent external auditors in accordance with internationally accepted principles of accounting.

Event

Steps taken to ensure that Turkish regulations are in harmony with those of the EU.

Result

- Formation of a single tariff system.
- Acceptance of EU practices in general (e.g., capital adequacy regulation for banks, among others)

Event

Establishment of the Istanbul Stock Exchange (1986).

Result

Greater liquidity in the Turkish financial system.

Event

Interbank Money Market (IMM) for Turkish Lira founded in 1986. Open market operations commenced in 1987.

Result

Non-residents are allowed to make purchases on the ISE and the Turkish residents are permitted to purchase foreign securities.