COMMERICAL BANKS AS CLOSED END FUND OWNERS: EVIDENCE FROM AN EMERGING MARKET

1. Introduction

Role of commercial banks in financial markets has been studied extensively in academic literature. There are studies showing that banks are better monitors and therefore bank loans are special (James, 1987; Diamond, 1991; Chemmanur and Fulghieri, 1994). Moreover, the theoretical paper by Puri (1999) shows that the banks are better certifiers of the quality of the firm going public as underwriters than investments banks.[1] The closed end fund puzzle is also one of the most widely studied anomalies in finance. In this paper, we combine these two lines of research by studying discounts on Turkish closed end equity funds. Because of the unique nature of the Turkish market commercial banks can have a closed end fund as their independent subsidiaries.[2] By analyzing the discounts on bank and non-bank affiliated Turkish closed end equity funds, we hope to contribute to our understanding of the role of commercial banks in financial markets.

Since closed end funds are investment companies that form portfolios of publicly traded securities and then issue publicly traded claims on their portfolios, they should be correctly priced in a well-functioning securities market. The stock prices of these funds are expected to be equal to the net asset value (NAV) of their portfolios. However, several empirical studies have shown that, in general, stocks of closed end funds trade at prices below their NAVs. For example, most U.S. funds traded at a discount greater than 20 percent on average during the 1970s, whereas the average discount on the U.K. funds was approximately 50 percent (Dimson and Minio-Kozerski, 1999). Although the size of discounts decreased in recent years, trading at a discount has still been the norm for closed end funds in developed markets (Zweig, 1973; Malkiel, 1977; DeLong, Shleifer, Summers and Waldman, 1990; Lee, Shleifer and Thaler, 1991). Similarly, some studies have shown that the prices of closed end funds also deviate from their NAV in emerging markets as well (Hardouvelis and Tsiritakis, 1996; Doukas and Milonas, 2004; Halkos and Krintas, 2006; Chan et al., 2008; Güner and Önder, 2009).

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[1] Consistent with Puri (1999)'s implications, Güner, Önder and Danışoğlu (2000) show that the underpricing is lower for IPOs that are underwritten by bank affiliated underwriters in the Turkish market even after controlling for other factors that affect the level of underpricing.

[2] This is also allowed in Greece (Hardouvelis and Tsiritakis, 1996).

There are several factors that may explain the discounts on closed end funds.[3] Malkiel (1995) lists the following factors: unrealized capital gains (Pratt, 1966; Malkiel 1977; Pontiff, 1995), restricted stocks or illiquid assets (Malkiel, 1977), liquidity of a fund's shares relative to that of a fund's stock holdings (Datar, 2001), turnover (Platt, 1966; Boudreaux, 1973; Malkiel, 1977), distribution policy (Malkiel, 1977; Thompson, 1978), insider ownership (Malkiel, 1977; Barclay, Holderness and Pontiff, 1993), agency cost or management expenses (Boudreaux, 1973), past fund performance record (Boudreaux, 1973; Malkiel, 1977), proportion of foreign stock owned, price level of shares, size of fund and investor sentiment about the stock market (Zweig, 1973; Brauer, 1988; De Long, Shleifer, Summers and Waldmann, 1990). All of these studies examine either the U.S. or the U.K. closed end funds.

Compared to closed-end funds in developed markets, very little is known about the determinants of discounts on closed end funds in emerging markets. Chan, Kota and Li (2008) examine the determinants of closed-end fund discount in Mainland China and report that stock concentration measured by the number of stocks in the fund, dividend payout ratio and turnover are negatively related with the size of the discount.

This paper tries to fill the gap in the literature by examining the determinants of discounts and premiums on closed end funds trading on the Istanbul Stock Exchange (ISE), an emerging market. Furthermore, this paper also analyzes the effect of commercial bank affiliation on closed end equity fund discounts after accounting for these other variables shown in the literature as determinants of discounts. Turkey is unique in terms of the ownership structure of closed-end funds because commercial banks are allowed to form these funds.

There are several reasons for studying the factors affecting discounts on closed end equity funds trading in emerging markets. First, the interest of international investors in emerging markets has been growing rapidly since the 1990s as investors seek to diversify their portfolios globally. Even though the 2008/2009 global crisis reduced the flow of funds to emerging markets, global investment in foreign assets is $96 trillion in 2010 (Roxburgh, Lund and Piotrowski, 2011).[4] In 2007, 8 percent of the global free-float equity investment is

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[3] Dimson and Minio-Kozerski (1999) provide an excellent literature review on the closed-end fund puzzle, providing both the explanations and the results of several empirical studies examining the discounts on the U.S. and the U.K. closed end funds.

[4] The share of emerging markets in the world market capitalization increased from 3.7 percent in 1986 to 10.7 percent in 1995 (Rea, 1996). Moreover, the U.S. mutual funds increased their investments overseas from $16 billion in 1986 to $285 billion in June 1996 and about 10 percent of it was in emerging market funds.

in emerging markets while investments in the U.S., Japan, the U.K. account for 45, 11 and 11 percent, respectively.[5] There are a total of 114 US funds covered by Mornigstar that invests primarily in emerging markets (Aggarwal, et al., 2005). Second, although some studies have shown that emerging markets are becoming more like developed capital markets (Korajczyk, 1996), some other studies have found that the behavior of returns in emerging markets differs significantly from that of developed equity markets (Harvey, 1995; Bekaert, Erb, Harvey and Viskanta, 1998). Therefore, differences in determinants of closed end fund discounts in developed and emerging markets may exist. Third, there are studies documenting that the behavior of emerging market country funds trading in developed markets is affected by changes in domestic fund premiums (Bodurtha, Kim and Lee, 1995). Therefore, the analysis of determinants of discounts in emerging markets might help investors to understand the behavior of discounts on closed end country funds as well. Fourth, the characteristics of closed-end funds in emerging markets are different from those in developed markets. For example, in Mainland China, the majority of investors in closed-end funds are insitiutional investors like pension funds and insurance companies, whereas retail investors hold these funds in developed markets to diversify their holdings (Chen, Kot and Li, 2008).

The analysis of the discounts on Turkish closed end funds is interesting for several reasons. The Turkish market has several characteristics that differ from many developed markets. First, unlike the U.S. funds, Turkish Type-A closed end funds are exempt from corporate taxes if they invest at least 25% of their portfolio in companies listed on the Istanbul Stock Exchange.[6] These funds are analyzed in this paper. Furthermore, investors don't have to pay capital gains taxes if they hold a stock for more than 3 months. Hence, tax hangover due to unrealized capital gains cannot explain the existence of discounts in this emerging market. Second, Turkish closed end equity funds mostly invest in stocks, Treasury bills and bonds, repos and foreign currencies. All of these assets have very liquid secondary markets. As a result, there is little reason to expect the liquidity of a closed end equity fund's

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According to Rea (1996), another $27 billion was invested in international funds in 1995 and approximately 56 percent of this amount ($15 billion) was invested in emerging markets. Furthermore, total long-term capital flows to developing economies grew at an average annual rate of 15 percent over the last decade according to the World Bank Debtor Reporting System.

[5] Source: Lagorio (2007). "Emerging Stock Markets are Still Good Investments – S&P", Reuters, http://www.reuters.com/article/bondsNews/idUSN1238114520070412.
[6] Turkish Type-B closed end funds don't have this investment requirement and tax exemption. At any point in time a Type-B closed end fund might be investing more than 25% of its portfolio in stocks listed on the ISE. However, there could be time periods during which these funds don't invest in stocks at all. Because of this of characteristics of Type-B funds they are excluded from our sample. At the beginning of our sample period, all the closed end funds listed on the ISE were Type-A funds. However, as of April 2013, there are 3 Type-B closed end fund shares trading on the ISE.

shares to be higher than that of a fund's stock holdings. Therefore, restricted stocks or illiquid assets or differences in the liquidity of fund's shares and its stock holdings cannot be explanations for Turkish closed end equity fund discounts either. Third, commercial banks play a very important role in financial markets of Turkey even though Turkey is considered to have a market based financial system (Levine, 2002). Furthermore, commercial banks being the locomotive of the financial markets, are allowed to establish closed end funds as their independent subsidiaries. As a result, twelve out of thirty-one closed end equity funds listed on the ISE during our sample period are established by commercial banks as their independent subsidiaries. These bank affiliated closed end funds usually have the name of the affiliated bank in their company title to emphasize and capitalize on this bank affiliation. A comparison of average discount and its determinants for bank-affiliated and non-bank affiliated closed end equity funds will provide some evidence on whether bank ownership/affiliation is an important factor affecting discounts in this market. Fourth, investor sentiment does not fully explain the existence of discounts on Turkish closed end equity funds (Güner and Önder, 2009). Finally, the results of this paper might be generalizable to other emerging markets because of the similarities between Turkish and other emerging markets.[7]

This article makes several contributions to the existing closed end fund literature. First, the article examines the closed end fund puzzle in an environment where unrealized capital gains or illiquid assets cannot be used as an explanation for the existence of discounts. Second, the effect of bank ownership on the discounts is examined in this market since commercial banks are allowed to establish/own close-end funds. Third, the determinants of discounts on closed end funds are analyzed in a market where the financial system is quite different from that in the U.S. and the U.K. markets.

Empirical analyses show that some of the factors affecting discounts in developed markets also explain the discounts in Turkish closed end equity funds. These are ownership structure, agency cost, liquidity of fund shares, past performance and general market conditions. When it comes to the analysis of discounts on bank and non bank afflilited closed end equity funds, univariate and multivariate results are not in agreement. Univariate results show no difference between discounts on bank and non-bank affiliated funds. This finding is inconsistent with the perceived strong role of banks in the financial system of Turkey. However, after taking into account the differences in characteristics of these two groups of

closed end equity funds in a multivariate setting, discounts on bank affiliated funds are documented to be significantly lower than those on non-bank affiliated ones. Consistent with arguments in Puri (1999), bank affliated closed end equity funds seems to be perceived as of a higher quality by the investors in this emerging market. Therefore, investors are willing to pay higher prices to invest in portfolios managed by bank affiliated closed end equity funds controlling for other differences in funds and portfolio characteristics. Our analyses also document the effect of most recent financial crisis experienced by the country on the perceived quality of bank and non-bank affiliated closed end equity funds. The difference between discounts on these two groups of closed end equity funds is lower after the crisis period than that before. This finding is consistent with observation that banks being hurt the most from this financial crisis.

The remaining sections of this paper are organized as follows. The next two sections present the characteristics of the ISE and Turkish closed end funds listed on the ISE. The fourth section explains the data and the methodology used in the analyses. The empirical findings are presented in the fifth section. The last section summarizes the findings and concludes the paper.

2. The Characteristics of the Istanbul Stock Exchange

The Istanbul Stock Exchange (ISE) is a relatively new market. It started operating in 1986. In December 2010, the ISE was ranked as the 28th in terms of total market capitalization in US dollars and 3rd in terms of turnover velocity among 51 stock exchanges that were members of World Federation of Exchanges.[8]

The ISE has some characteristics that are similar to those of other emerging markets, but different from the characteristics of developed markets. First, empirical studies indicate that the market is weak-form efficient. However, evidence on the semi-strong form efficiency of the ISE is inconclusive (Aydoğan and Muradoğlu, 1998; and Muradoğlu and Ünal, 1994). Second, since it is a newly established market, investment in stocks is a relatively new alternative for Turkish investors compared to other assets such as gold or time deposits. Third, most individuals make short-term investments in the ISE; Yüce, Önder and Mugan (1999) find that the holding period is less than four months for 80 percent of individual investors in this market. Hence, the high turnover rate is not surprising given the short holding period of the average investor. Fourth, banks have played a major role in the

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[8] Source: http://www.world-exchanges.org/statistics/monthly-reports.

development of the stock market in Turkey. In the early years of the ISE, commercial banks were allowed to act as intermediaries and investment banks in the stock market and to form closed end funds. However, since 1996, banks are required to establish or purchase a financial intermediary in order to perform these investment banking activities. However, these banks continue to have their name as part of the name of the closed end fund. Therefore, it is very easy to identify which closed end funds are affiliated with banks. Hence, bank affiliated funds might benefit from the reputation of banks in the financial system of Turkey. The list of bank affiliated closed end funds and the affiliated banks are presented in Table 2, Panel A.

The ISE does not have any restriction on foreign portfolio holdings and allows free repatriation of proceeds from investments in Turkish stocks. Therefore, the involvement of foreign investors has increased dramatically over time. As shown in Table 1, there was no foreign investment in the ISE in 1988, but foreign investment reached its highest level of 70,262 million U.S. dollars in 2007. This increase in international investment in the ISE is not unique. Over the past several years, involvement of international investors in emerging markets has increased tremendously (Levine and Zervos, 1996). However, after the Russian and Turkish economic crises, a decline in foreign involvement is observed. Foreign investment in the ISE corresponded to 10.03 percent of total market capitalization in 2002, right after the financial crises in this market and increased since then. It corresponds to almost one-fourth of the market capitalization of the ISE in 2007.

3. The Characteristics of Turkish Closed end Funds

The first closed end equity fund started trading in 1991 on the ISE. During the sample period from July 1995 to December 2007, there are a total of 31 closed end equity funds trading on the ISE.[9] Twenty four of these funds started during the sample period analyzed in this paper. So, there are a total of 31 closed end equity funds in our sample as of December 2007 and of those 12 are bank affiliated funds.

In order to establish a closed end fund, a corporation must obtain permission from the Capital Market Board of Turkey.[10] Within approximately fifteen days after their IPO, the

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[9] Closed end funds constitute a small portion of the total market capitalization of the ISE. When we consider investment companies, including closed-end funds, open-end funds and pension funds, their portfolio value constitutes 10.5% of total market capitalization of the ISE as of June 2007. Similarly, in the U.S., mutual funds held 12.2 percent of total value of outstanding stocks in 1994 (Edwards, 1996).

[10] The Capital Market Board of Turkey is similar to the Securities Exchange Commission of the U.S. It regulates the operations of the ISE and the firms that are listed on it.

closed end fund's shares start trading on the ISE. Turkish closed end funds are required to report their portfolio holdings in major asset categories, stocks by sector, government securities by maturity, repurchase agreements and foreign exchange, etc, to the ISE every Friday since July 1995. Moreover, once a month, closed end funds must report individual securities included in their portfolios. Hence, their montly reports provide even more detailed information on actual holdings of these funds.

The portfolio of closed end funds may consist of investments in stocks, Treasury bills and Treasury bonds, as well as foreign exchange and valuable commodities, such as gold. In this study we analyze closed end equity funds because they are required to invest at least 25% of their portfolio in stocks listed on the ISE. The closed end equity funds in our sample mainly hold stocks, Treasury bills, and repurchase agreements. On average, stocks constitute approximately 60 percent of the portfolio holdings of these funds during the sample period analyzed in this paper.

Several restrictions on the portfolio holdings of closed end equity funds are imposed by the Capital Market Board of Turkey. First, at any point in time, they have to invest at least 25% of their portfolios in stocks trading on the ISE in order to have the tax exempt status.[11] Second, they are not allowed to hold more than 9 percent of the shares of any company. Third, they cannot invest more than 10 percent of their NAV in the securities of a single company. If this limit is exceeded because of changes in the NAV of the closed end equity fund, the portfolio holdings of the fund should be adjusted within three months to satisfy the requirements of the Capital Market Board. The closed end equity funds are allowed to participate in IPOs, however they are not allowed to invest in domestic or foreign closed end or open-end funds.

There is no requirement for dividend payment. In general, they do not pay dividends. For example, only three of the existing twenty-two Turkish closed end funds paid dividends in 2002 and only six out of 31 funds distributed dividend in 2007. Four of the Turkish closed end equity funds have not paid any dividends since their establishment.

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[11] All of the funds satisfied this restriction during our sample period.

4.   Methodology and Data

4.1. Discounts and Their Determinants in the Turkish Market

Weekly closed end equity fund prices relative to their NAVs are examined for the period between July 1995 and December 2007 in this paper. The percentage discount for a fund i in a given week t, $DISC_{it}$, is calculated as,

$$DISC_{it} = \left[\frac{NAV_{it} - SP_{it}}{NAV_{it}} \right] \times 100,$$

where NAV_{it} is the market value of a fund i's porfolio[12] at the end of the week t and SP_{it} represents the stock price of fund i at the end of week t.   A positive $DISC_{it}$ value indicates a discount and a negative number indicates a premium.

Given the factors used in explaining the discount in the literature and the regulation in Turkey, unrealized capital gains cannot be used as an explanation for the existence of discounts in Turkey since closed end funds are exempt from taxes. Moreover, the investor sentiment hypothesis only partially explains the discounts on closed end equity funds in Turkey (Güner and Önder, 2007). Therefore, the remaining explanations of discounts can be grouped into the nine categories; portfolio composition, diversification, liquidity, agency cost, ownership structure, size of the fund, past performance, dividend payout and market conditions. These categories are defined in the following paragraphs.

Portfolio Composition: There is no restrictions on holding illiquid stocks. However, funds are required to hold at least 25 percent of their NAVs in stocks in order to be exempt from capital gains tax. Common stocks are by far the riskiest and the hardest to hedge among the assets invested in by closed end equity funds in Turkey. Hence, discounts are expected to increase as a fund increases its investment in common stocks. Although Grullon and Wang (2001) fail to document a statistically significant relationship between this variable and the discounts on the U.S. equity funds, the stock holdings of Turkish funds might be an important factor in explaining the discount on them because of stock market inefficiencies.

According to the investor sentiment hypothesis, small stocks are mainly held by small investors and therefore, they are affected more from the investor sentiment. If closed end equity funds also invest in small stocks, they will face investor sentiment risk. In order to

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[12] We have weekly closed-end fund data and financial statements are prepared quarterly. Therefore, we don't have fund operating expenses on a weekly basis. As a result, what is called as NAV in this paper is actually market value of closed end fund's portfolios on a per share basis. Since we are dealing with weekly data, exclusion of fund operating expenses in calculating the NAV of a fund is not expected to have a big impact on our results. Furthermore, discounts reported in this paper are expected to be higher than the actual discounts on funds because of this exclusion.

control for this effect, the share of stock holdings invested in the smallest three size decile portfolios will be included in the empirical model. It is expected that as the small stock holdings of funds increase, their discount will increase as well.

Diversification: Another appealing explanation for discounts is the level of diversification in the fund's portfolio (Boudreaux, 1977). This explanation is dismissed for the U.S. closed end funds because individual investors can easily achieve the diversification benefits by themselves. On the other hand, Chan, Kota and Li (2008) report a negative relationship between number of stocks held in a fund's the portfolio and its discount. Similarly, diversification might be a valid explanation for discounts on Turkish closed end funds because stock investment is relatively new, diversification is costly, and principles of modern portfolio management are not utilized by Turkish individual investors (Yüce, Önder and Mugan, 1999). Therefore, investors could be willing to pay a higher price for a well-diversified portfolio constructed by a closed end fund. As a result, the more diversified a fund's portfolio, the smaller the expected discount.

Liquidity: Liquidity of the fund's own shares might be an important factor affecting the discounts on closed end equity funds in Turkey. Datar (2001) argues that discounts are observed when claims issued by funds are less liquid than the assets included in their portfolios. Using several trading activity measures as proxies for liquidity, he documents empirical evidence strongly supporting his claims. Moreover, Boudreaux (1973) finds a significant relationship between trading volume of fund shares and the discounts on these funds. Similarly, Chan, Kota and Li (2008) report a negative relationship between turnover and discount for Chinese Closed End Funds. Therefore, it is hypothesized that funds with more liquidity will have smaller discounts, controlling for the fund's size.

Agency cost: According to the agency cost argument, if the cost of forming and maintaining the fund is high, the discount will be large as well because these types of expenses are not considered in the NAV calculation. Malkiel (1977) and Lee, Shleifer and Thaler (1990) did not find support for the agency cost explanation for discounts on the U.S. funds and Ammer (1990) finds only partial support for the U.K. funds. However, it might be a valid explanation for the existence of discounts on Turkish closed end funds because of low levels of public float rate and restricted rights of minority shareholders[13] in Turkish companies (Önder, 2003).

Ownership Structure: The ownership structure of funds might also affect the size of

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[13] For example, Turkish laws do not give minority shareholders any judicial avenue to challenge a manager's decisions.

the discounts in emerging markets even though it is not considered to be an important factor in explaining discounts on the funds traded in developed markets. Banks have played an important role in the development of the stock market in Turkey. Moreover, the first Turkish closed end fund, Vakif Fund, was established by one of the state banks in Turkey. Currently, about fourty percent of the funds are affiliated with a bank. Banks may acquire more information about companies than the market and other financial institutions. Similarly, the individual investors might think that banks have better information about the stocks in which they invest. Furthermore, big banks are one of the most reputable financial institutions in Turkey because of the banker crisis of the early 1980s. Counting on the reputation that they have in the eyes of investors, banks share the same name with their affiliated funds. If these arguments are correct, then funds that are affiliated with banks are expected to have a lower discount than non-bank affiliated funds.

According to Grullon and Wang (2001), funds with large blockholdings are expected to have higher discounts. However, they fail to report significant relationship. They argue that as the fund is dispersely owned by many shareholders, the discount is expected to be lower; but as the holdings of the largest shareholders increase, the discount is expected to increase. This can be explained by the agency cost between large and minority shareholders, as well. If ownership is not dispersed, or if there are few large shareholders, these large shareholders might use the funds for their own purposes and their actions may not be controlled by the minority shareholders who have limited rights in emerging markets like the ISE. Although Malkiel (1977, 1995) does not find any significant relationship between percentage of shares held by insiders and discount on the U.S. funds, it might explain the discounts on Turkish funds because of their low public ownership rate. For example, on average 7.7 percent of the U.S. closed end equity fund shares are held by blockholders (Grullon and Wang, 2001). On the other hand, the mean fraction of shares held by the largest shareholder is 22.43 percent in Turkish closed end equity funds and, on average, only 56.16 percent of the shares are held by shareholders with less than 1 percent ownership.

Size: Although size of the fund is one of the potential explanatory variables mentioned by the financial industry, Malkiel (1995) fails to find a significant relationship between the size of the discount and the size of the fund. However, this might be a valid explanation for discounts in an emerging market where investors may not be well-informed about the operations of a company. In such a market, investors might use the size as an indicator of the quality of the fund. Furthermore, large funds might be able to have lower managerial, administrative and transaction costs because of economies of scale in their

operations. Hence, the discount is expected to be lower for larger closed end funds.

Past Performance: Investors might be willing to pay a premium if they think that the fund will perform well in the future. When past performance is used as a proxy for future performance, it is expected that the higher the return on a fund based on its NAV, the smaller is the size of the discount.

Age: Investors are more familiar with older funds. Furthermore, older funds might be perceived as being more experienced in stock investments. Therefore, older funds are expected to have lower disounts.

Dividend Yield: According to Malkiel (1977), higher the distributions to the investors, lower the discounts are expected to be. Therefore, dividend yield variable is added to the base model as an additional control variable.

Investor Sentiment: When investors are optimistic in general, they wil be optimistic about individual closed end funds as well. As a results, discounts on individual funds is expected to be lower when investors are in general optimistic. This variable controls for the mood of the investors in general

Market Condition: The general performance of the market might affect the size of the discounts as well. If the investor sentiment theory holds, as the market goes up, people will be optimistic about the stock market resulting in a decline in discount. On the other hand, if it is a bear market, the pessimism will increase in the market, resulting in an increase in the size of the discount.

4.2. Empirical Model

The following regression model is estimated to analyze the factors explaining the discounts on Turkish closed end equity funds:

$DISC_{it}$ = *f(Portfolio Composition, Diversification, Liquidity, Agency cost, Ownership Structure, Size, Past Performance, Age)*

Portfolio Composition is measured by two variables: *SHOLD* measures the percentage of the closed end equity fund's portfolio invested in stocks and *S3DECILE* is the share of NAV invested in stocks from the smallest three decile portfolios. As the stock holding or the share of the portfolio invested in stocks from the smallest three size decile portfolios increases, the discount of the fund is expected to increase. Because funds report their individual stocks holdings on a monthly basis, *S3DECILE* is available on a monthly basis in our dataset.

Diversification is measured by two variables given the available data: the number of

different sectors a fund's portfolio is invested in (*NINDUSTRY*) and the number of different stocks held in a fund's portfolio (*NSTOCKS*). Funds can diversify their portfolios by investing in stocks from different industries and by investing in different stocks. As a fund's diversification increases due to either variable, the discount is expected to decline. Because each fund is required to report their investment in different industries every week and report their investment in different stocks every month, the former variable is available on a weekly basis and the latter variable is available on a monthly basis.

Liquidity of the fund shares is measured by the turnover rate (*TURNOVER*). It is defined as the ratio of trading volume of a fund's shares to its number of shares outstanding.

Unfortunately, there is no information about the payments made to portfolio managers. Therefore, the natural logarithm of the fund's administrative expenses, *LOGADMEXP*, is used as a proxy for agency cost. Administrative expenses are in nominal terms and they are increasing throughout our sample period partly because of high inflation rate experienced in the country. To account for changes in administrative expenses due to inflation, these expenses are deflated by inflation before taking their logarithms.

Ownership structure is measured by two variables. *BANK* is an indicator variable taking a value of 1 if a fund is affiliated with a commercial bank and 0 otherwise. The other ownership variable, *LARGE*, measures the ownership concentration. It is defined as the proportion of a fund's equity held by the largest shareholder of the fund.

The logarithm of the total NAV of the fund (*LOGNAV)* is used to control for the size of the fund. The past performance is measured by the lagged return on the NAV of the fund (*LRNAV*).

The age is the natural logarithm of the one plus fund's age in years at that point in time. In order to eliminate autocorrelation in error terms, the lagged discount, $DISCOUNT_{t-1}$, is also included in the model.

This basic model is augmented with three more variables to test the robustness of our findings. These variables are the dividend yield, average discount on all closed end equity funds and the market conditions.

The market is proxied by the return on the ISE-100 index (*RMARKET*). Turkey experienced a currency and banking crises in February 2001 resulting in the failure of the sixth largest bank (Demirbank) of the country and nine more banks. In order to control for the impact of this crisis on the movement and the size of the discount, a dummy variable, *CRISIS*, is created. The beginning of these crisis is marked as November 17, 2000 (Alper, 2001). Therefore, crisis dummy variable takes a value of 0 for the period before November

17, 2000 and 1 for the period after that.

The lack of weekly data on some variables leads us to estimate two different models. Because the individual industries invested in a fund's portfolio are reported on a weekly basis, the following base model is estimated using weekly data:

$$DISCOUNT_t = f(DISCOUNT_{t-1}, \quad BANK_t, \quad LARGE_t, \quad SHOLD_t, \quad NINDUSTRY_t,$$
$$LOGADMEXP_t, LOGNAV_t, TURNOVER_t, LNAGE_t, LRNAV_t,) \quad (1)$$

Because names of individual stocks included in a fund's portfolio is reported on a monthly basis, the monthly base model includes variables about a fund's stock holdings in addition to the weekly variables:

$$DISCOUNT_t = f(DISCOUNT_{t-1}, \quad BANK_t, \quad LARGE_t, \quad SHOLD_t, \quad NSTOCK_t, \quad S3DECILE_t,$$
$$LOGADMEXP_t, LOGNAV_t, TURNOVER_t, LNAGE_t, LRNAV_t,) \quad (2)$$

In estimating these models, the General Method of Moments (GMM) model is used because of heteroscedasticity and non-normal distribution of discounts. These base models are later augmented to include dividend yield of closed end equity funds, average discount on all closed end equity funds and average return on stocks. To analyze the effect of financial crisis on discounts for non-bank and bank affiliated closed end equity funds, these models are re-estimated by adding $CRISIS \times BANK$ interactive dummy variable to the base models.

4.3. Data Sources

The data used in the analyses are obtained from several publications and databases maintained by the ISE. NAVs of closed end funds on Fridays, the number of shares outstanding at the funds' initial public offerings, their holdings in major asset categories (stocks by sector, government securities by maturity, repurchase agreements and foreign exchange, etc), and individual securities included in their portfolios are obtained from the Weekly and Monthly Bulletins of the ISE.

The Friday closing prices of closed end funds, the level of ISE-100 composite index, and Friday closing prices of all the stocks listed on the ISE are also obtained from the databases maintained by the ISE. Closing prices are adjusted for stock splits and stock dividends. Similarly, the number of shares outstanding for each stock and closed end eequity fund is adjusted for stock splits and stock dividends. Information on dividend payments of

closed end equity funds is obtained from the databases maintained by the ISE.

Splits are quite common for stocks listed on the ISE. The high incidence of splits observed on the ISE can be explained by the relatively high inflation rate per year during our sample period.[14] While working with the price and the NAV data for Turkish closed end funds, it was observed that some funds are slow to report the change in their number of shares outstanding after the split. Since the stock price is adjusted immediately after the split by the ISE, this timing difference results in periods of artificially high discounts for closed end funds. Therefore, in order to eliminate the bias in our results with these "wrong reports", NAVs of each fund are re-calculated from total market value of their portfolio holdings and their adjusted number of shares outstanding for the whole sample period. Moreover, some funds adjust NAV of their portfolios, with respect to their dividend payments before the ex-dividend day, resulting in artificially high premiums. Similar to the stock split adjustment, if incorrect adjustments are observed with respect to dividend payments, NAVs are corrected by adding dividend payments to the NAV of the portfolio before the ex-dividend day.[15]

Information on the number of different sectors and stocks in a fund's portfolio are obtained from the weekly reports of closed end funds published in the ISE Weekly Bulletins. Information on ownership structure and administrative expenses are obtained from the Annual Yearbooks of Companies published by the ISE.

5. Empirical Findings

First, the characteristics of Turkish closed end equity funds over the sample period are presented in this section. Then, the results of the empirical analysis of the determinants of closed end equity funds discounts are discussed.

5.1. Characteristics of Turkish Closed end Funds

The discount is the norm for Turkish closed end funds during the period between July 1995 and October 2005. Figure 1 presents the movement of the average value-weighted discount of all Turkish funds with the level of ISE-100 index. Like discounts in developed markets, the average discount on the funds fluctuates from week to week. The funds are traded at

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[14] Keeping the price within a reasonable price range is a common explanation given for stock splits. Because of high annual inflation rate in Turkey, it is hard to keep stock prices within that range without having frequent splits.

[15] These adjustments did not result in any loss of data. Dividend payment and stock split corrections are done for about 170 out of almost 13,000 observations. Therefore, they are not expected to influence the findings of this study.

premiums over six short periods: during July 1995, between February and April 1997, between January 2000 and March 2000, between April 2000 and November 2000 which is just before the major currency and banking crises in Turkey, between April 2004 and June 2004, and between September 2004 and November 2004. The figure suggests that there is an inverse relationship between the movement of the ISE-100 index and the average discount on Turkish funds in the middle part of the sample period. When the index increased sharply at the beginning of 2000, the discounts declined significantly. However, after 2005, they moved in the same direction.

The discounts on bank-affiliated funds and funds established by other financial intermediaries or individuals show some differences in Figure 2. Although bank-affiliated funds trade at a premium in some periods, non-bank affiliated funds trade at a discount almost all the time during our sample period. In general, the discount on non-bank affiliated funds is greater than that on bank-affiliated funds. However, this trend was reversed in February 2001. This period coincides with the major banking crisis experienced in the country. After the crisis, the bank-affiliated funds start trading at a higher discount than the non-bank affiliated funds and this continued until April of 2004.[16] The failure of one large commercial bank affiliated with a closed end equity fund as a result of this crisis and the possible manipulation of accounts in other banks around the same time period may have resulted in Turkish investors losing their trust in the banking system. As a result of this possible loss of faith in the banking system, the prices of bank-affiliated funds decreased and their average discount increased after crisis. However, after April 2004, banks and bank affiliated closed end equity funds seem to re-gain the confidence of investors and discounts on bank affiliated closed end equity funds become lower than that on non-bank affiliated funds for a while. Since December 2004, the discount on bank-affiliated funds is again higher than the discount on non-bank affiliated funds.

Table 2 presents some characteristics of the 31 closed end funds traded on the ISE during the sample period of this paper. The number of observations changes depending on the initial public offering date of the fund.[17] The results show that Turkish closed end funds

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[16] During this crisis, Demirbank which owned Demir Fund failed. Although one might think that the failure of this bank might be the reason for an increase in the size of discount for bank-affilaited funds after the crisis, the elimination of Demir Fund does not affect the relationship between the discounts on bank and non-bank affiliated funds. The failure of the owning bank did not lead to the liquidation of Demir Fund. The ownership of this fund was transferred to another bank (Denizbank) and it was renamed as Deniz Fund.

[17] Although Avrasya Fund has been trading in the ISE since July 1996, it is excluded from the sample from September 2000 to July 2002. During this time period, the premium on this fund is much higher than the

are, on average, sold at a discount, in line with the U.S. funds. The average value-weighted discount is more than 12 percent, which is higher than the discount reported for the U.S. closed end funds (Weiss, 1989; Lee, Shleifer and Thaler, 1991). However, there are large fluctuations across funds in terms of average discounts. The average discounts on individual funds during the sample period range from a premium of 21.75 percent (for Garanti Fund) to a discount of 41 percent (for Atlantis Fund). Eleven of the closed end funds, on average, trade at a premium over the period analyzed. Eczacibasi Fund seems to be correctly priced in the market on average. Garanti Fund, owned by a bank, has the highest mean NAV per share during the sample period. There is not much variation in the NAVs of the remaining funds.

There is no specialization among the Turkish closed end funds in terms of concentration of their investments in certain industries. It seems that all funds prefer to invest in banks, holding and investment companies, and stocks of companies operating in textile, chemicals petroleum, rubber and plastic products, fabricated metal products, machinery and equipment, and non-metallic mineral industries. On average, the investment in these industries is more than 10 percent of the investment in stocks over the sample period.

The mean values of several characteristics of funds are presented in Table 3 for all Turkish closed end funds as well as bank and non-bank affiliated funds. The average value-weighted discount is lower for bank-affiliated funds than the average value-weighted discount for non-bank affiliated funds (11.865 versus 13.16 percent) as seen in Figure 2. However this difference in discounts of bank- and non-bank affiliated closed end equity funds is not statistically significantly different from zero. The hypothesis of equality of means of the several fund characteristics for bank and non-bank affiliated funds are tested using a t-statistic. It is found that there is a significant difference between bank and non-bank affiliated funds in each of these characteristics except turnover of their shares and their lagged NAV returns. Non-bank affiliated funds invest 66.23 percent of their assets into stocks whereas the average share of stocks in the portfolios of bank-affiliated funds is much lower (49.80 percent). Non-bank affiliated funds, on average, invest in 14.57 different stocks and 7.91 different sectors. On the other hand, bank-affiliated funds, on average, invest in 17.85 different stocks and 8.79 different sectors. So, bank-affiliated funds seem to have more diversified portfolios compared to non-bank affiliated funds. Furthermore, non-bank affiliated funds invest more in stocks from the smallest three deciles (7.13%) compared to the

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highest premium that is observed for other mutual funds during our sample period. Furthermore, the fund has been under investigation for possible manipulation in its price during part of this time period. When no observations are deleted, the average premium on this fund was 558.68 percent and it ranged from 231.18 percent to 1390.60 percent during this period.

bank-affiliated funds (1.25%).[18]

In addition to portfolio characteristics, Turkish closed end funds differ in terms of their ownership structure. On average, the percentage of fund's shares held by the largest shareholder is 26.89 percent for non-bank related funds and 21.81 percent for bank related funds.

Although there are only slight differences in the magnitudes of administrative expenses and NAVs of bank and non-bank related funds, they are found to be significantly different at 1 percent. On the other hand, the turnover rate of non-bank affiliated funds is not significantly different than that of the bank affiliated funds. Moreover, non-bank affiliated funds provide investors with a higher dividend yield than bank affliated funds. Bank affiliated funds, on average, are older and larger than non-bank affiliated funds.

5.2. Determinants of Discounts on Closed end Funds

The Generalized Method of Moment (GMM) estimates of the models specified in equations (1) and (2) are presented in Table 4. Our model explains about 93 (82) percent of the variation in weekly (monthly) discounts. Bank ownership, ownership structure, agency cost, liquidity of the fund, market conditions, and past performance seem to be valid explanations for the existence of discounts on Turkish closed end funds. Although diversification is not found to be a significant factor, the percentage of fund investing in small stocks is found to be positively associated with the size of the discount.

Table 5 and 6 report the results for the four different models estimated with weekly and monthly data. Model 1 reported in Table 4 is taken as the base model. Then in Models 2 through 4 one of the additional variables are added to the model individually. The model 5 reported in the last column has all the variables. The lagged discount has a positive and statistically significant coefficient in all the models estimated with weekly and monthly data indicating persistence in discounts. Bank indicator variable, our variable of interest has a negative and statistically significant coefficient in all the models using both weekly and monthly data. This indicates that discounts on bank affiliated closed end equity funds is lower than that for non-bank affiliated funds. This finding is not consistent with the univariate test results. However, there are so many differences in characteristics of non-bank and bank affiliated closed end equity funds. After controlling for these differences which are

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[18] All of the stocks traded in the ISE are divided into ten decile portfolios in terms their market capitalization every year. Then, the proportion of fund's assets invested in the smallest 3 and 5 size decile portfolios are calculated.

also other determinants of discounts, bank affiliated funds have a lower discount than non-bank affiliated funds. This finding is consistent with our apriori expectations. Lower discounts for bank affiliated funds indicate that investors are paying higher prices for these funds after controlling for other determinants of discounts. This is consistent with banks being important players in the Turkish financial system and their reputations spilling over to closed end equity funds affiliated with those banks.

Furthermore, funds with more concentrated ownership (*LARGE*) have lower discounts in all the models estimated. This is inconsistent with the conflict of interest argument between large and minority shareholders. Conversely, this finding might be consistent with large shareholders being better monitors of fund manager's activities.[19] This finding is consistent with what is observed for the U.K. closed end funds. Gemmill and Thomas (2006) find that discounts are significantly affected from the corporate governance measures. This paper confirm their findings.

Percent of fund's portfolio invested in stocks has a negative and statistically significant coefficient in only models 1, 2, and 4 with monthly data. It indicates a decline in discount for funds as their investment in stocks increases. This might be consistent with investors buying closed end equity funds shares to achieve a diversified investment in stocks. This variable loses its significance when average discount on all closed end equity funds is added to the model (Models 2 and 5). Average discount on all closed end equity funds is a measure of investor sentiment and it is shown to be negatively correlated with returns on large company shares. Since closed end equity funds are mostly investing in large company shares, this negative relationship between *SHOLD* and discount might be a reflection of investor sentiment. Our diversification variables, *NINDUSTRY* in weekly models has a negative but statistically insignificant coefficient. On the other hand, *NSTOCK* in monthly models have a negative and statistically significant coefficient when the return on the stock market is controlled for. These results indicate that as funds increase the number of securities in their portfolios, the discount declines significantly, supporting the diversification hypothesis. In monthly models, *S3DECILE* has a positive and statistically significant coefficient. As funds increase their holding of the smallest stocks, their discount increases significantly as predicted by the investor sentiment hypothesis controlling for NAV and other fund characteristics. This finding can also be explained by the risk and lower liquidity of

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[19] We also measure ownership concentration with the public ownership. Its coefficient is found to be insignificant as well. In order to conserve space, these results are not reported in the paper; however, they are available from authors upon request.

these stocks.

It is found that if our proxy for agency cost, general administrative expenses, increases, the discount on Turkish funds increases significantly in both models. This finding supports the agency cost explanation of discounts.

Fund's size is only significant in all of the weekly models and monthly models 3 through 5. It has a positive and statistically significant coefficient indicating higher discounts for larger funds.

Furthermore, as the turnover rate of fund increases, the size of the discount declines. Hence, the frequently traded funds seem to be correctly priced in the market. However, we did not find significant impact of fund's age on the discounts.

Another factor affecting the discounts is the lagged performance of the fund. Investors might be using past performance, i.e. lagged return on NAV, as an indicator of future performance. Lagged NAV return has a negative and statistically significant coefficient in all of the weekly models but not in monthly models. This finding indicates that higher lagged NAV returns on the portfolio of the fund results in lower discounts for the fund.

Dividend yield does not have a statistically significant effect on discounts when added to the model individually. On the other hand, average discount on all closed end equity funds has a positive and statistically significant coefficient in Models 3 and 5. So, when investors are pessimistic they are also pessimistic about closed end equity funds. Finally, return on the stock market has a negative and statistically significant coefficient in Models 4 and 5. As the return on the market portfolio increases, discounts on closed end equity funds decreases significantly. This finding is consistent with investor sentiment explanation. When small investors are optimistic about the stock market in general, they might be investing more in closed end equity funds and as a result, the size of the discount declines.

To see whether banking crises affect the discounts on non-bank and bank affiliated closed end equity funds, *CRISIS×BANK* interactive dummy variable is added to the base model. In both models with weekly and monthly data, bank dummy variable has a larger coefficient in absolute value indicating a larger difference in discounts for non-bank and bank affiliated closed end equity funds. More interestingly the coefficient on the *CRISIS×BANK* interactive dummy variable is positive and statistically significant in all the models. This finding indicates that discounts on bank affiliated closed end equity funds are higher in after crisis period than those in before crisis period. As a result, the difference between the discounts on non-bank and bank affiliated closed end equity funds is lower in the after crisis

period than that in before crisis period. This is consistent with our conclusions from visual inspection of Figure 2. This is consistent with loss of trust to banks after the banking crisis. The results for other explanatory variables of interest do not change significantly when this interactive dummy variable is included in the models. Neither the size nor the sign of coefficient estimates on other explanatory variables change by a material amount. Furthermore, the explanatory power of the regressions does not change significantly either.

6. Conclusions

This study examines the pricing of closed end funds in an emerging market, namely the Istanbul Stock Exchange. First, it is shown that closed end funds in the ISE trade at discounts as well. The size of the discount in the ISE is larger than that observed for closed end funds in the U.S. market. Furthermore, the discount on Turkish closed end equity funds fluctuates widely over time just like the discount on the U.S. funds does.

After documenting the discount and its variability, the factors affecting this discount is investigated for the funds traded on the ISE with a cross-sectional analysis. The results indicate that when analyzed in a univariate setting, there is no difference between discounts on bank and non-bank affiliated funds. This finding is inconsistent with the perceived strong role of banks in the financial system of Turkey. However, when analyzed in a multivariate setting, this difference in discounts on bank and non-bank affiliated funds becomes statistically significantly negative. This finding indicates lower discounts for bank affliated closed end equity funds. Consistent with arguments in Puri (1999), bank affliated closed end equity funds seems to be perceived as of a higher quality by the investors in this emerging market. As a results, investors are willing to pay higher prices to invest in portfolios managed by bank affiliated closed end equity funds. Our analyses also document the effect of most recent financial crisis experienced by the country on the perceived quality of bank and non-bank affiliated closed end equity funds. Since banks are the financial institutions which are affected the most from that financial crisis, bank affiliated closed end equity funds seemed to have negative externalities from that crisis as well.

Moreover, multivariate analyses documents ownership structure, agengy cost, liquidity of fund shares, past performance and general market conditions as determinants of discounts on Turkish closed end equity funds. Furthermore, fund's size and age do not significantly affect discounts on Turkish closed end equity funds.

The findings of this paper have several implications for international investors in emerging markets as well as for the country fund managers. First, this study shows that the

findings in the developed markets can not be generalized to the emerging markets that have different characteristics. Second, contrary to the findings for the U.S. market (Malkiel, 1995), ownership structure is an important variable that explains the discount observed in this emerging market. Third, the perceived role and the reputation of intermediaries in Turkish financial system might be quite different from those in developed markets. Hence, all of these effects have to be considered in making investment decisions in Turkish market. Since the ISE has many characteristics similar to those of other emerging markets, the findings of this paper might be generalized to other emerging markets as well.

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Table 1 – The Yearly Development of the ISE, 1988-2007.

Year	Number of Shares Traded (million)	Trading Volume (million USD)	Market Capitalization (million USD)	% change in the index	Foreign Investment (in million USD)	Number of Firms Listed	Number of Closed end Funds	Value of Closed end Funds (million USD)
1988	32	$115	$1,128			79	0	$0
1989	238	773	6,756	367.84	$17	76	0	0
1990	1,537	5,854	18,737	14.64	89	110	0	0
1991	4,531	8,502	15,564	-21.96	147	134	1	1
1992	10,285	8,567	9,922	-45.64	359	145	2	4
1993	35,249	21,770	37,824	205.67	753	160	2	16
1994	100,062	23,203	21,785	-50.40	1,256	176	3	17
1995	306,254	52,357	20,782	-7.42	1,936	193	9	20
1996	390,917	37,737	30,797	39.57	3,085	213	14	40
1997	919,784	58,104	61,879	83.89	6,018	244	16	78
1998	2,242,531	70,396	33,975	-50.71	3,700	262	17	47
1999	5,823,858	84,034	114,271	241.77	15,358	256	21	122
2000	11,075,685	181,934	69,507	-50.58	7,404	287	21	103
2001	23,938,149	80,400	47,689	-31.80	5,635	279	22	66
2002	33,933,251	70,756	34,402	-33.95	3,450	262	22	45
2003	59,099,780	100,165	69,003	111.38	8,954	285	22	110
2004	6,639,955	147,755	98,073	38.11	16,141	297	23	212
2005	8,338,906	201,763	162,814	60.56	33,835	304	26	368
2006	5,976,128	229,642	163,774	-6.12	39,776	316	31	322
2007	5,398,138	300,842	289,986	72.14	70,262	319	33	370

This table shows the total number of shares traded, total dollar value of traded shares, the total market capitalization, the percentage change in the ISE-100 Composite index, the amount of investment in ISE securities by foreigners, the number of companies listed on the ISE, the number of closed end mutual funds listed on the ISE, and the market capitalization of closed end mutual funds, by year. The decline in the number of shares traded in 2004 is because of the change in the lot size with the conversion of currency to the new lira, YTL (1 YTL=1,000,000 TL). Source: ISE Bulletins.

Table 2 – Some Characteristics of Turkish Closed end Mutual Funds: July 1995 – June 2007.
Panel A – Bank-Affiliated Funds

Closed end Funds	Major Owner (Bank)	First Trading Day	Mean Discount (%)	Standard Deviation of Discount (%)	Mean NAV per share	Number of Weeks in the Sample
Ak	Akbank	May 26, 1999	30.64	23.48	2.4334	445
Alternatif	Alternatifbank	September 2, 1996	15.39	48.78	2.2465	585
Demir (Deniz)	Demirbank	October 30, 1995	-14.89	73.89	1.8188	612
Finans	Finansbank	April 22, 1996	39.69	15.88	2.1691	604
Garanti	Garanti Bankası	November 18, 1996	-21.75	97.15	4.1869	574
İş	İş Bankası	April 15, 1996	17.24	32.08	2.6910	605
Oyak	Oyakbank	May 4, 2007	21.73	7.60	1.1021	33
Sınai Yatırım (TSKB)	TSKB	October 23, 2001	11.45	42.40	1.4874	319
Varlık	Türk Ekonomi Bankası	July 2, 1998	10.39	43.99	1.9040	489
Vakıf	Vakıfbank	August 28, 1991	7.84	39.57	2.8999	644
Yapı Kredi	Yapi Kredi Bankası	October 23, 1995	36.92	17.30	2.3210	629
Yatırım Finansman	İş Bankası	October 6, 1999	-4.86	40.17	1.4954	425

Table 2 – Some Characteristics of Turkish Closed end Mutual Funds: July 1995 – June 2007.
Panel B – Non-Bank Affiliated Funds

Closed end Funds	First Trading Day	Mean Discount (%)	Standard Deviation of Discount (%)	Mean NAV per share	Number of Weeks in the Sample
Ata	October 9, 1997	-7.99	42.87	3.8036	527
Atlas	February 28, 1994	33.23	21.06	3.3175	643
Atlantis	May 18, 1995	41.00	16.47	2.6984	644
Avrasya	July 8, 1996	-22.19	75.10	1.8045	518
Baskent	May 26, 2006	20.29	7.76	1.0650	78
Bumerang	May 29, 1995	20.27	44.00	1.5187	644
Eczacibasi	January 26, 1999	13.06	34.70	1.8326	462
Euro (EMBYO) EGCYO	June 26, 2006	-21.36	35.98		77
Evg (EVNYO)	July 11, 2005	18.48	12.23	1.3220	126
Evren	March 14, 1995	27.78	33.72	2.7333	643
Gedik	April 16, 1999	-8.71	44.73	1.8962	450
Global	April 21, 1992	22.62	27.26	2.6144	579
Hedef	October 6, 2005	-7.09	11.34	0.9117	114
Info	March 4, 2004	-2.83	26.37	1.0145	197
Metro	June 2, 2006	-7.91	18.45	0.8974	81
Mustafa Yilmaz	February 23, 1995	10.54	56.67	1.3578	634
Tac	April 10, 1997	10.01	25.55	3.5548	553
Tacirler	July 10, 2006	14.05	9.92	0.9828	75
Taksim	June 2, 2006	-18.15	36.12	0.8526	81

Table 3 –The Characteristics of Turkish Closed end Mutual Funds.

Variables	All Funds			Non-Bank Affiliated Funds			Bank-Affiliated Funds		
	Mean	Std Dev	N	Mean	Std Dev	N	Mean	Std Dev	N
Discount (%)	12.57	48.06	12,994	13.16	43.24	7,062	11.87	53.24	5,932
Portfolio Characteristics									
Number of Securities	16.03	7.06	3,862	14.58	6.22	2,148	17.85	7.61	1,714
Number of Industries	8.31	2.78	12,893	7.91	2.50	6,962	8.79	3.00	5,931
Share of Stocks (%)	58.73	22.21	12,994	66.23	23.25	7,062	49.80	17.03	5,932
Share of Stocks in Deciles 1-3 (%)	4.52	8.28	3,856	7.13	10.12	2,145	1.25	2.65	1,711
Ownership Concentration									
Share of the Major Owner (%)	24.57	20.13	12,994	26.89	22.25	7,062	21.81	16.85	5,932
Public Float Rate (%)									
Other Characteristics									
Log(Size)	15.90	1.05	12,994	15.57	0.78	7,062	16.30	1.18	5,932
Turnover Rate	16.58	28.43	12,994	16.90	29.46	7,062	16.20	27.16	5,932
Log(age)	1.71	0.67	12,893	1.68	0.69	6,962	1.75	0.64	5,931
Lagged Return on NAV	0.26	5.72	12,934	0.25	5.90	7,024	0.26	5.49	5,910
Dividend Yield	7.89	26.47	12,994	10.87	34.21	7,062	4.34	10.91	5,932
Log(Administrative Expenditures)	13.63	0.76	12,994	13.46	0.70	7,062	13.83	0.78	5,932

Note: N represents the number of observations for each variable. It changes depending on the availability of data on a monthly or weekly basis. Bank-affiliated funds have 5,932 weekly and 1,714 monthly observations. Except the variables *Discount*, *Turnover Rate* and *Lagged Return on NAV,* all of the characteristics of bank-related mutual funds are different from non-bank related mutual funds at 1 percent significance level.

Table 4 – GMM Results of the Main Model – Determinants of Discounts on Closed end Funds

	Weekly Estimations		Monthly Estimations	
	Model I	**Model I with Interaction**	**Model I**	**Model I with Interaction**
INTERCEPT	-7.648	-8.276	-21.226	-25.364
	0.00	0.00	0.00	0.00
LAG(DISCOUNT)	0.944	0.943	0.855	0.854
	0.00	0.00	0.00	0.00
BANK	-0.843	-1.691	-2.004	-4.672
	0.00	0.00	0.02	0.00
*BANK*CRISIS*		1.281		3.933
		0.00		0.01
LARGE	-0.036	-0.039	-0.080	-0.088
	0.00	0.00	0.00	0.00
STOCK HOLDINGS (%)	-0.008	-0.008	-0.057	-0.052
	0.20	0.25	0.01	0.02
NUMBER OF INDUSTRIES	-0.015	-0.019		
	0.74	0.66		
NUMBER OF SECURITIES			-0.053	-0.068
			0.38	0.26
STOCKS IN DECILE 1-3 (%)			0.084	0.085
			0.01	0.01
LN(ADM.EXP.)	0.544	0.713	1.519	2.093
	0.00	0.00	0.00	0.00
LN(MARKET VALUE)	0.266	0.192	0.717	0.581
	0.04	0.15	0.15	0.24
TURNOVER	-0.083	-0.084	-0.173	-0.175
	0.00	0.00	0.00	0.00
LN(AGE)	0.053	-0.196	0.396	-0.394
	0.71	0.20	0.33	0.41
LAGGED RETURN ON NAV	-0.104	-0.102	0.036	0.042
	0.00	0.00	0.66	0.60
Adj. R^2	0.935	0.935	0.824	0.825
N	12802	12802	3728	3728

Note: The values in the second row of each variable represent p-values.

Table 5 – GMM Estimates – Determinants of Discounts on Closed end Funds Using Weekly Data

	Model 2	Model 3	Model 4	Model 5
INTERCEPT	-8.143	-15.535	-7.910	-17.425
	0.00	0.00	0.00	0.00
LAG(DISCOUNT)	0.944	0.933	0.943	0.931
	0.00	0.00	0.00	0.00
BANK	-0.901	-0.944	-0.833	-1.034
	0.00	0.00	0.00	0.00
LARGE	-0.034	-0.037	-0.036	-0.033
	0.00	0.00	0.00	0.00
STOCK HOLDINGS (%)	-0.008	0.000	-0.007	0.003
	0.22	0.99	0.28	0.67
NUMBER OF INDUSTRIES	-0.015	-0.045	-0.036	-0.071
	0.73	0.31	0.41	0.11
LN(ADM.EXP.)	0.577	0.650	0.528	0.697
	0.00	0.00	0.00	0.00
LN(MARKET VALUE)	0.273	0.585	0.313	0.678
	0.04	0.00	0.02	0.00
TURNOVER	-0.083	-0.082	-0.080	-0.079
	0.00	0.00	0.00	0.00
LN(AGE)	0.028	-0.129	-0.002	-0.248
	0.85	0.37	0.99	0.10
LAGGED RETURN ON NAV	-0.102	-0.114	-0.102	-0.108
	0.00	0.00	0.01	0.00
DIVIDEND YIELD	-0.009			-0.015
	0.19			0.04
AVERAGE DISCOUNT		0.070		0.077
		0.00		0.00
RETURN ON ISE			-0.103	-0.113
			0.00	0.00
Adj. R^2	0.935	0.935	0.934	0.934
N	12802	12802	12307	12307

Table 6 – GMM Estimates - Determinants of Discounts on Closed end Funds Using Monthly Data

	Model 2	Model 3	Model 4	Model 5
INTERCEPT	-20.478	-43.935	-24.785	-45.820
	0.00	0.00	0.00	0.00
LAG(DISCOUNT)	0.854	0.825	0.859	0.829
	0.00	0.00	0.00	0.00
BANK	-1.925	-2.099	-2.104	-2.133
	0.03	0.02	0.01	0.02
LARGE	-0.084	-0.082	-0.072	-0.076
	0.00	0.00	0.01	0.00
STOCK HOLDINGS (%)	-0.058	-0.028	-0.060	-0.031
	0.01	0.22	0.01	0.19
NUMBER OF SECURITIES	-0.054	-0.069	-0.115	-0.128
	0.37	0.24	0.06	0.04
STOCKS IN DECILE 1-3 (%)	0.085	0.069	0.084	0.070
	0.01	0.03	0.01	0.04
LN(ADM.EXP.)	1.470	1.774	1.347	1.531
	0.00	0.00	0.00	0.00
LN(MARKET VALUE)	0.709	1.628	1.208	2.079
	0.16	0.00	0.02	0.00
TURNOVER	-0.173	-0.168	-0.163	-0.158
	0.00	0.00	0.00	0.00
LN(AGE)	0.440	-0.012	0.045	-0.307
	0.28	0.98	0.91	0.44
LAGGED RETURN ON NAV	0.030	-0.019	0.062	0.024
	0.71	0.81	0.50	0.79
DIVIDEND YIELD	0.015			0.008
	0.10			0.39
AVERAGE DISCOUNT		0.193		0.182
		0.00		0.00
RETURN ON ISE			-0.098	-0.108
			0.00	0.00
Adj. R^2	0.824	0.829	0.822	0.827
N	3728	3728	3494	3494

Figure 1 - Average Discount and ISE-100 Index over the Period,
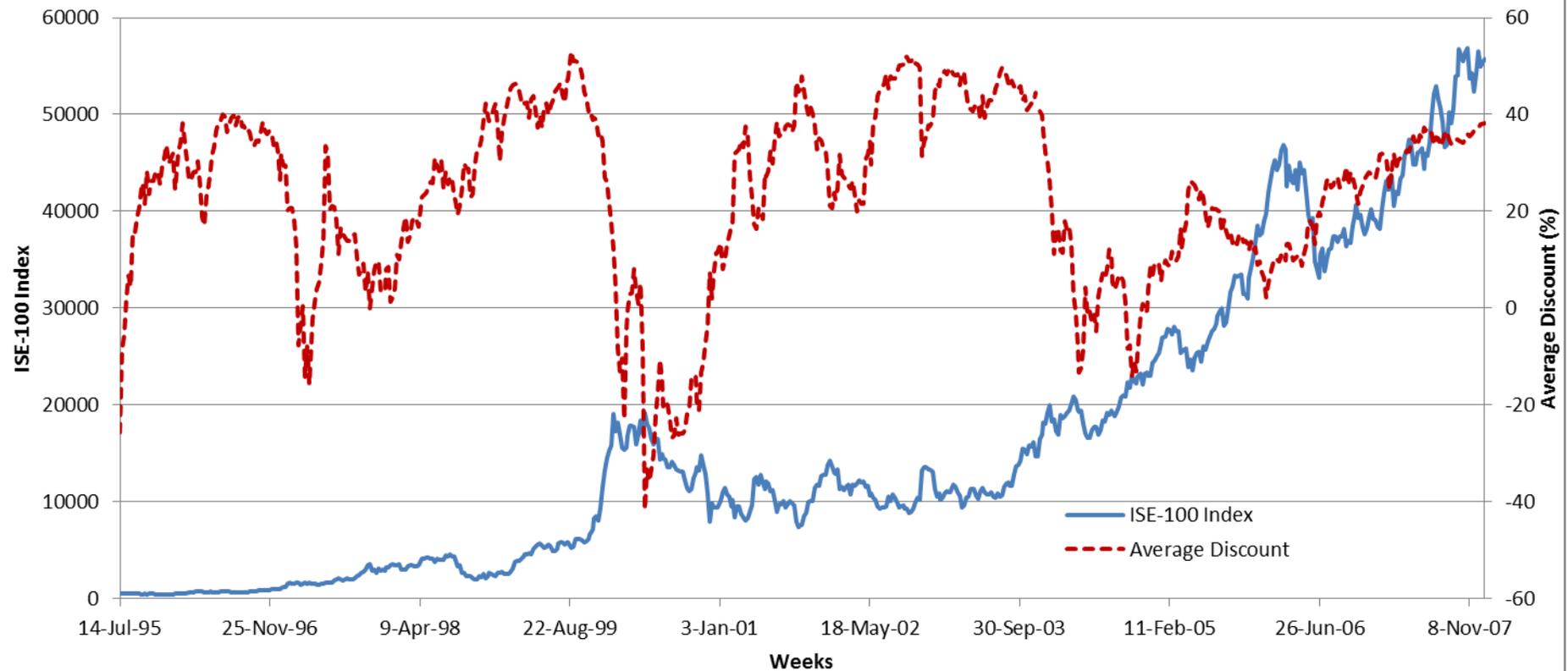July 1995 - December 2007.

Figure 2 - Average Discounts on Bank-Affiliated and Non-Bank Affiliated Funds, July 1995 - December 2007