Valuation of Opacity in Turkish Banking Industry

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ABSTRACT

This study investigates Turkish banking industry in terms of opacity. Opacity can be defined as a market condition where consumers have limited information about each bank's asset portfolio and its ability to repay the debt. Recent studies proved that banking sector in general has an opaque nature and it is difficult for markets to evaluate their fair value. Such asymmetric information may lead banks to be vulnerable in times of internal and external disturbances. Turkey had experienced severe financial crises in the last decade because of its banking structure. Although banking system seemed to be progressed afterwards, its need to be realized that banking opacity continues to threats whole banks and so the economy. This study examines Turkish banks that are publicly traded in the Borsa Istanbul between 2003-2008. Banks are studied whether their opaque nature generates greater return than transparent assets. Second, it is identified whether opaque oriented banks have an influence on valuation discount of those banks. Finally, in order to assume that opacity creates systematic risk, the study investigates how opaque assets contribute to price synchronicity. Findings show that banks are better off when they invest more in opaque assets relative to transparent assets. It is also found that opaque assets create cost of equity capital hence greater valuation discounts necessity. Lastly it is statistically significant that opaque structure leads price synchronicity among Turkish stock market.

Keywords: Opacity, Valuation Discounts, Price Synchronicity, Borsa Istanbul

ÖZ

Bu çalışma Türk bankacılık endüstrisini opaklık bazında araştırmaktadır. Daha önce yapılan çalışmalar göstermiştir ki, bankacılık endüstrisi genel olarak opak bir yapıya sahip ve bu nedenle piyasaların bankaların asıl değerini gösteremediğini ortaya koymuştur. Piyasaların gerçek değeri yansıtamamasının sebebi asimetrik bilgi olarak değerlendirilebilir ve bu durum bankaları iç ve dış tehditlere karşı savunmasız bırakır. Geçtiğimiz 10 yıl içerisinde Türk bankacılık sektörü ağır krizler yaşamıştır; bankaların son zamanlardaki performansı istikrarlı görünse de opaklığın bankalar ve dolayısıyla ekonomi için tehlikesi sürmektedir. Bu çalışma, 2003-2008 yılları arasında Borsa İstanbul'da işlem göre 10 banka üzerinde yapılmıştır. Öncelikle, bankaların opak yapısının, aynı yapı içindeki şeffaf varlıklarla kıyaslanıp, daha fazla karlılık getirip getirmediği incelenmiştir. Daha sonra, opak varlıkların değerleme iskontosuna yaptığı etki araştırılmıştır. Son olaraksa; fiyat senkronunun sistematik risk yarattığı varsayılarak, opak varlıkların fiyat senkronuna etkisi incelenmiştir. Çalışma sonuçları opak varlıkların karlılık üzerinde şeffaf varlıklardan daha fazla etkisi olduğunu göstermiştir. Ayrıca, opak varlıkların sermaye maliyetini artırdığını ve değerleme iskontosunu yükselttiği gözlemlenmiştir. Son olarak, Türkiye piyasalarında bankacılık opak varlıklarının fiyat senkronu üzerinde pozitif etkisi olduğu istatiksel olarak kanıtlanmıştır.

Anahtar Kelimeler: Opaklık, Değerleme İskontosu, Fiyat Senkronu, Borsa İstanbul.

ACKNOWLEDGMENTS

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LIST OF ABBREVIATIONS

BR   : Breitung

CORDEP   : Core Deposits

EBT   : Earnings before Taxes

EXVAL   : Excess Equity Capital

INTRISK   : Interest Risk

IPS   : Im, Peseran and Shin

ISE   : Istanbul Stock Exchange

LLC   : Levin, Lin and Chu

LNASSETS   : Logarithmic Form of Total Assets

M-W   : Maddala and WU

NONINT   : Non-Interest Income

PSYNC   : Price Synchronicity

OTHLOAN   : All other Loans

OTHOPQ   : Other Opaque Assets

TRADE   : Trading Assets

TRANSP   : Transparent Assets

Chapter 1

INTRODUCTION

1.1 Importance of Opacity

As in all countries, banking industry has a crucial importance for the Turkish economy. Banks are the main providers of funds within the financial system; they are the ones taking the mission of matching surplus of funds and shortage of funds in order to satisfy the need of those two parties. It is a known fact that a distortion in banking sector of any economy may cause devastating consequences in that economy. Therefore, government bodies are constantly working on regulations of financial intermediaries and also on monitoring their healthiness to keep the confidence in the system. One of the most assuring confidences in this regard is the deposit insurance which is promised by governments to its citizens if there is a bankruptcy.

As of April 2013, deposit insurance amount in Turkey is 23,300 euros (around 50,000TL) and which means people who have deposit in their banks will be compensated in case of a bankruptcy. Without the deposit insurance, banking industry will be vulnerable since the depositors is not going to easily decide between healthy and unhealthy banks. Deposit Insurance prevents bank depositors' runs but also it may invite moral hazard problems (Grossman, 1992; Wheelock and Kumbhakar, 1995). In order to prevent moral hazard, governments apply regulations

and examinations. Since the failure of banks has a critical importance for the economies, bank opaqueness is a crucial reason to regulating and examining banks.

Even though the regulations and deposit insurance make banks safer, it is still hard for investors to distinguish healthy and non-healthy banks because these measures do not prevent the bank opacity (Flannery and Sorescu, 1996). The reason why even the most analytical investors cannot separate banks' opaqueness is that all banks are required to disclose same information in the same formation. However, one should acknowledge that distribution of a bank's balance sheet might a lot riskier than the other because of the asset choice of that bank. For example, two different banks may hold same amounts of trading assets among their assets at the end of a fiscal quarter but since trading assets are more liquid, during a quarter period of time they can be easily moved or changed. Banks' loans are another source of bank opacity because they are not clear enough for one to see the details of that loan. When the publicly disclosed financial statements are examined, it can be seen that the details regarding a bank's loans are not specified which again makes hard to assess that banks riskiness by the investors. Such obscurity also creates asymmetric information among the savers and the lenders (Heider et al,, 1996). Unsatisfied disclosure of information causes opacity and asymmetric information but even though the bank discloses the information, investors may not interpret the quality of the data or because of the complexity of the industry; the riskiness of a bank may not be realized by all investors (Jones, Lee and Yeager, 2013).

In literature, opaqueness is associated with financial crises. According to this statement, Spargoli (2012) points that financial markets cannot work properly

because investors will be unable to justify banks' situation after a shock hits the banking system. It has been observed that in the subprime mortgage crisis, the valuation discount of banks with more opaque assets, have been increased significantly due to their distributions of assets (Jones, Lee and Yeager, 2013). Opaque assets can be simply defined as assets that are hard to measure their true nature; banks' opaque assets mostly contain loans and easily substitutable assets such as tradable assets. Due to the fact that banks are opaque concentrated; grading agencies seem to disagree more over banks than over other types of firms (Morgan, 1997). Therefore, opaque assets are considered riskier than transparent assets. As a result, banks with more transparent assets create less information uncertainty and if banks are keeping opaque assets then those are expected to generate higher return than the transparent assets but with a cost of leading to an information uncertainty. So, opacity of banks can be linked with the profitability of banking sector.

Banks may invest more on opaque assets in order to generate higher returns when the return is compared with transparent assets. So, when investors are willing to determine fundamental value, they need to apply greater discount for opaque assets. If the valuation discount is identified incorrectly because of the uncertain nature of banks' distribution of their assets then banks are going to enjoy for their selections of opaque assets with higher share prices. Therefore, it may create an incentive for them to invest in opaque instruments even more.

Another concern regarding opacity is price synchronicity. In this study, banking opaqueness is going to be examined whether it is creating price synchronicity. The logic behind that investigation is to identify if the banks with opaque assets are valued inefficiently by the investors, then feedback effect will occur and accordingly, other banks in the market will be encouraged to invest more in opaque assets which

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will in turn create a price synchronicity. If such synchronicity exists, then it may cause an increase in systematic risk.

1.2 Aim and Contribution of the Study

The aim of this study is to investigate the effects of bank opacity and its implications in terms of bank profitability, price synchronicity of banking stock returns in Turkey. This investigation covers the years 2002-2007 just before the mortgage crisis and also in 2008. If we would be living in a perfect market then the opaqueness and subsequently risk level of any bank could be assessed perfectly and valued accordingly. But there is a great possibility that investors cannot determine the true riskiness since the opacity is inherited in banking industry. Such mispricing can cause a price synchronicity and could push banks to take an advantage and enjoy higher share prices which in turn may cause severe crushes in financial system. The recent global sub-prime mortgage crisis that has started in 2008 made whole banking industry and investors uncomfortable. It was such an unexpected distortion and revealed how banks are vulnerable around the globe because of great concentration of riskier assets.

Chapter 2

LITERATURE REVIEW

In the literature, market opacity in general and its effects in economies are studied from different perspectives in order to reveal the outcomes of it. Relative to other industries, banking sector opacity has acted a significant attention due to the fact that the banks' role in their economies. Prior sub-prime mortgage financial crisis has shown that being opaque could be quite dangerous when the investors are noticed how non transparent their banks are.

Price synchronicity regarding banking industry equity shares has been investigated in the prior studies. In order to understand the trend of synchronicity, determinants of banking equity shares should be observed. Furthermore, making a distinction between developing and developed countries is necessary regarding their supervisory system because it may have an influence on banks for their motivations and willingness to disclose more or detailed information about their conditions. As a result, information disclosure might affect stock prices and even price synchronicity among the whole banking industry in that country.

Regulatory bodies in banking industry provide deposit insurance in order to keep the confidence of small investors, especially in times of bank related crises. As the depositors of banks believe that their funds are safe, there is no incentive for them to withdraw their money. Such confidence environment may motivate banks to disclose

more public information. On the other hand, Demirguc Kunt and Detriagiache (1999) state that deposit insurance may cause investors to control less of their banks which also causes moral hazard and managers of banks to take advantage from such laxity. Bill Francis et al. (2012) found that countries with deposit insurance together with the less state bank ownership, higher banking industry freedom and lower bank orientation have less price synchronicity. On top of that, Francis et al. (2012) concluded that high economic growth countries that have higher macro stability, better protection of property rights also have less stock price synchronicity.

This study aims to show price synchronicity of Turkey among banking industry. In prior studies countries are examined in terms of their synchronicity level. Since Turkey is an emerging country, it is crucial to make a distinction between developed and developing economies. Also, it will be beneficial to take a look at price synchronicity patterns in different economies by considering the whole industries and not separating the banking industry at first. In that regard, Morck et al. (2000) revealed that stock prices in countries that have relatively high per capita GDP (gross domestic product) tend not be synchronized but on the other hand, countries with relatively less per capita GDP have a trend that stock prices are moving together. In that study, Morck et al. (2000) stated that the reasoning behind their results could be based on firms which in emerging economies can be related on the same ground and principles. For instance, firms in such environment are more likely not to be diversified, they may be avoid a superior protection for private property rights and it causes a loss of attraction in their stock markets for informed arbitrages. Furthermore, political distortions or even remorse of it could lead stock price movements among the entire market. When the countries are ordered according to their per capita GDP in order to rank their level of price synchronicity, it has been

discovered that United Stated which is one of the most developed country in the world has the lowest degree of synchronicity while Turkey was the highest fifth country that has a same stock movements across its stock exchange market (Morck et al, 2000).

Equity share price synchronicity is consisting with poor market information and opaqueness. Empirical evidence that Morck et al. (2000) have been found is also confirmed by other several studies. Jin and Myers (2005) have concluded that countries which have high price synchronicity in their market with a higher R^2 are relatively more vulnerable and they are experiencing more financial crashes in their economies. The reason for that is due to those countries' information environments with a great degree of opacity. Li, Morck, Yang and Yeung (2004) observed that as the country based means of R^2 values declined over time; information disclosure, level of capital market liberalization and effective legal system are increasing at the same time. Such negative relationship is leading a greater improvement in those economies which means that the opacity level is diminishing. R^2 is driven from the CAPM (Capital Asset Pricing Model). After beta values are calculated from CAPM, R^2 is found by regressing daily index and stock returns of traded stocks in order to determine the price contagion level.

Since United States has lower R^2 and less price synchronicity in its capital markets, Durnev et al. (2004) examined structure of the U.S. firms in terms of openness, information transparency and investment decisions to examine if their level of disclosure is consistent with their R^2s. The findings were also consistent and approved that with a lower R^2, firms had a lot few difficulties with asymmetric

information, coordination between firms and capital suppliers and hence greater efficiency on their investments.

In prior studies, it has been suggested that opaqueness severely threatens economic environments of countries. In general opacity in an economy prevents to assess fundamental value of firms for the investors. Bank opacity in specific deserves to pay even more attention since financial intermediaries are backbones in any financial system. Jones et al (2012) investigated banks during the announcements of mergers between the periods of 2000-2006 prior to the sub-prime mortgage crisis and revealed that banks that are opaque investment oriented enjoyed more from intra industry re-valuations associated with announcements. Their findings showed how U.S. banks that are not merged had higher returns because they were actually taking risk by investing on opaque assets. Subsequently, during the time when the crisis has been occurred those were the ones who had most severe damage and experienced sharp price declines because of greater opaqueness.

Morgan (2000) emphasizes that a bank's asset distribution is a lot different than non-financial firm. Banks hold quite few fixed assets compare to its financial assets which are mostly composed of loans. The reasons that absence of physical assets and abundance of financial assets create a security uncertainty since collaterals attached to those assets are not known by the outsiders. Among the financial assets trading assets are contributing to bank opacity. Myers and Rajan (1998) explains "paradox of liquidity" by mentioning how trading assets are actually transparent unlike bank's loans. These assets are highly liquid as much as they are transparent but the problem is that they are highly switchable. For example, after trading assets are published in the balance sheet, bank management can replace some of its trading assets, sell them

or simply add some more risky ones to their portfolios which make this account to be difficult to track.

If financial intermediaries are assumed to be opaque in their nature then it is challenging for anyone to assess the fundamental value of banks in general. Therefore, it can be assumed that there must also be a disagreement among the rating agencies (Morgan, 2000). Morgan (2000) has investigated bank opacity by showing such disagreement between major grading agencies. He examined entire bond issues in United States between the years of 1983 until 1993. He used regression in order to measure the disagreement of ratings among the rating agencies by using average rating, issuer type and the year of the issue. In general, he observed that disagreement is decreasing as risk and maturity of on issue is decreasing. Together with that Morgan (2000) confirmed that the rating agencies disagree a lot more often about banks' ratings. The split which is the absolute difference between grades taken into consideration and the mean together with other characteristics of an issue; the split probability was deviating around 18 percent and the difference of this variation compare to banks and non-financial firms was as high as 12 percent. As the opacity emerges, it makes firms to become uncertain for investors and even though for the professional and globalized rating agencies such as Moody's and S&P. The tendency of disagreement among all industries is pointing that the sectors which deal with asset backed securities market are easier to interpret and grade due to their riskier nature. Grading banks and also insurance companies' bonds on the other hand, creates different opinions for the rating agencies and the splits are greater. (Morgan 2000).

Yang (2012), investigated portfolio decisions and contracts of banks by assuming that banking industry is highly opaque. In that opaque environment consumers can't distinguish healthy and sick banks. Such non efficient taking of risk by the banks is not traceable by the investors until a bank declares a loss. After a heavy loss is incurred, investors run away from the banks that they realized are risky and this may lead bankruptcies across the industry. Yang (2012) in his research is indicating the motivation behind the preference of choosing opaque assets by financial intermediaries.

Chapter 3

TURKISH BANKING INDUSTRY

As its nature, banking industry is accepted as an opaque environment. Even though the studies made in the literature prevails this fact, a further look into the Turkish banking industry is necessary since the study is going to be applied on Turkish markets. Therefore, this section is intended to give general information about the Turkish Banking industry. Statistical data is obtained from the Banks Association of Turkey. The period which the data set is given covers the years from 1985 to 2011.

Since we consider the whole Turkish banking industry, one of the important indicators is obtained from balance sheet. On the asset side, liquidity is crucial against customer withdrawals and also when customers come along with loan requests. Liquid assets are composed of cash in vault and in central bank, cash that hold in other banks and money market securities. Total amount of liquid assets were 4,401 thousands TL in the year 1985 and it significantly risen to 149,854,867 thousands TL as of December 2011. Loans and Receivables account is the biggest asset item and covers one third of the total assets among the banks. Starting from the 1985 to 2011 loans and receivables account grew each year and it has reached an amount of 184,289,489 thousands of TL.

3.1 Structure of the Economy and Banking Sector; An Overview

In order to assess the banking sector in mentioned years, it is necessary to examine both external and internal factors that made influence on the development of banking industry. External political and economic factors made a significant impact on the Turkish economy and so on the banking system. In 1991, economy of Turkey is imposed to external shocks because of the Gulf crisis. As it is written in the development report by Banks Association of Turkey (2010), international capital investors pull back their capital and this caused domestic trade to be slowed together with big down in the tourism sector. Another shock is experienced throughout in world in 1997 because of the Asian crisis. Asian crisis was an important lesson for all financial systems in terms of understanding the negative effects of opacity. Because of the structural imbalances in finance sector and discrepancies in balance sheets among the banks caused increased risk perceptions between the investors. Therefore, emerging economies such as Turkey are considered more non-transparent and untrustworthy, which in turn caused capital withdrawals. Finally in 1998, Russian crisis is appeared. Even though global impact of this crisis was relatively minor compare to prior crises, devaluation of ruble and FX liberalization process made a negative impact on Turkish economy in trade channel.

Domestic factors were also accelerated the possibility of having a financial crisis. When the pre-crisis period is examined until 2001, unstable growth rates were disturbing. The economy was excessively depended on the international capital inflows and therefore between the years 1990 and 2000 growth performance was moving up to 9.7 percent to a down level of -5.5 percent. Public sector debt was another problematic part of the Turkish economy and financial deficit reached to

10% of the national income in the year of 1994 in which domestic markets together with political distortions prevented treasury to borrow at longer maturities. Balance of public sector and also balance of payment distortions caused interest and exchange rate pressures. The general price level was also increasing and between the periods of 1990-2000 inflation rates was highly unstable and volatile. Under these circumstances, expectations have worsened and subsequently it has been more difficult for to access to funds of longer maturities. Unstable condition of interest rates continued and such environment was not suitable for traditional banking activities.

In the beginning of 1990s, banking and finance sector had a small share compare to other economies but especially to developed countries around the world. Financial structure of Turkey was serving more for the public sector and less for the private and also it had a powerless deposit to credit transformation. On the other hand, financial liberalization has fastened process of banking sector growth and it became easier for private entrepreneurs to open new banks. Table 1 shows the increase in number of branches, personnel and total asset shares in the sector. After financial liberalization, increasing number of private banks, branches and asset shares escalated quickly and therefore transmission period into the liberalization of the banking sector required setting up a different infrastructure for the new system. As a result, adaptation to a new system made financial industry more fragile with contribution of the mentioned domestic and international negative factors.

Table 1. Operational Indicators of Banking Industry

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number of Banks	66	65	69	70	67	68	69	72	75	81	79
Number of Branches	6,560	6,477	6,206	6,241	6,104	6,240	6,442	6,819	7,370	8,104	8,298
Share of Total Assets*	47,2	45,2	44,3	42,3	47	46,3	45,5	43,9	44,1	46,30	47,8
Share of Total Assets**	62,1	60,1	58,3	55,8	62,9	61,7	60,4	60,2	60,4	67,5	69,2
Share of Global Capital %	3,5	3,3	3,7	3,8	3,0	2,9	3,0	4,7	4,4	7,1	3,4

Source: BRSA, BAT. Participation Banks were included as of 2005
*For the 5 largest banks. ** For the 10 largest banks*

In 2000 of November, interest rates increased sharply. That was an indication that the risk perception of the investors is high and it subsequently leads a massive capital outflow, this in turn resulted with a decrease in Central Bank reserves and spillover effect continued with stock prices and one of the medium sized financial intermediary has crashed in the stock market. A series of measures started to taken in order to stop the panic that the financial sector had in. However those measures are seemed just temporary and Turkish Lira was imposing a heavy speculative attack. As a result of such formation and developments; November 2000 and February 2001 crises took place in Turkish banking history.

Because of the tension and panic in the markets; while demand for Turkish Lira was decreasing, it was increasing rapidly for foreign exchange. Central Bank intervened in order to reverse the situation and sold around six billion dollars due to foreign investors are left Turkish markets. Since investors were buying more foreign exchange and keep demanding it, Central Bank reserves declined significantly and caused interest rates to increase even more.

After interventions and measures that are taken by authorities, a severe reflection of the November crisis is eased.

Severe regulations and rules have been applied carefully in order not to experience such vulnerabilities in banking sector of Turkey. As a matter of fact, Turkish banking industry showed a solid performance after the banking crises mentioned above. However, one must keep in mind that opacity exists in banking sector since it is considered as its nature among all banks. Global financial crisis which started in 2008 in US, lead panic all around the world including Turkish markets. Since the markets are globalized, external impacts must also be aware of. To success more secure system in banking, opacity should not be ignored.

Chapter 4

DATA AND METHODOLOGY

4.1 Source and Type of Data

Data set used in in this study is based on banks that are publicly traded in Turkey. Since the data availability is crucial to make a sound analysis, in total 10 banks are taken out of 15 publicly traded banks. The sample period is composing over the 2003 to 2008 prior to sub-prime mortgage crisis and quarterly bank data is used throughout the sample. Data are extracted from the official web site of the Banks Association of Turkey (2013) and Financial Information News Network (2013). All figures in the data set are taken as nominal euro terms.

4.2 Methodology

In order to determine the bank opacity on profitability, valuation discounts of banking industry and price synchronicity, three models are developed and in total, 12 different variables are used. Trading assets (TRADE) and all other loans (OTHLOAN) are specified as opaque asset variables and they are taken from banks' balance sheets. Last opaque asset classified variable, other opaque assets (OTHOPQ) are calculated from balance sheets by subtracting total loans, trading assets and transparent assets from total amount of assets. Transparent assets (TRANSP) are used to make a distinction from opaque assets and this variable is calculated by taking sum of cash, funds that are kept in other banks and institutions, and guarantees and warrantees items. Earnings before taxes income (EBT) is taken from banks'

income statements. Non-interest income (NONINT) and core deposits (CORDEP) variables are also collected from balance sheets. Total asset variable is computed in its logarithmic form in order to capture its growth effects (Katırcıoğlu, 2009). Interest risk (INTRISK) is calculated by subtracting liabilities form assets that have a maturity of less than 1 year and used as currency value in euros. Bank leverage variable (LVRG) is calculated by subtracting total liabilities over assets from 1 to represent banks' leverage.

4.2.1 Panel Unit Root Tests

Panel unit root tests are conducted in this study on all the variables that are mentioned above. The methods used are constructed by Levin, Lin and Chu (LLC) (2002), Im, Pesaran and Shin (IPS) (2003) and Maddala and Wu (1999) and Breitung (BR) (2000). Levin, Lin and Chu (2002) test anticipates common unit root procedure for our panel data. IPS and M-W tests on the other hand, predict for individual unit root procedure for panel data analysis. It should be noted that M-W test is superior compare to IPS test since the value of M-W test is not based on various lag lengths in singular ADF regressions (Baltagi and Kao, 2000). Moreover, Baltagi and Kao (2000) point those Fisher type methods like M-W are more dominant than IPS in regards of size adjusted power.

4.2.2 Pooled (Panel) Regression Analysis

Recent studies revealed that banking industry opacity caused systematic risk among markets (Jones et al, 2013). To be able to understand how opacity makes an influence on markets and within the banking industry, three different models are developed. In the first model where bank opacity and profitability is investigated, following functional identification has been suggested:

$$EBT=\beta_0+\beta_1(TRADE)_t+\beta_2(OTHLOAN)_t+\beta_3(OTHOPQ)_t+\beta_4(TRANSP)_{t+}\acute{\varepsilon}_t \qquad (1)$$

where earnings before taxes (EBT) represents banks' profitability and a function of trading assets (TRADE), all other loans (OTHLOAN), other opaque assets (OTHOPQ) and transparent assets (TRANSP). The model predicts how opaque assets impact on earnings before taxes and also including transparent assets to make a contrast with opaque assets. In this point following hypothesis will be developed:

H_0 = Opaque assets do not export positive impact on profitability.

H_1 = Opaque assets export positive impact on profitability.

After identify the relationship between profitability and opaque variables of banks compare to transparency, we developed our second model to specify the impact of opacity on valuation. Excess equity charter value is regressed with opaque asset variables and several bank specific variables that the function is as follows:

$$EXVAL = \beta_0+\beta_1(TRADE)_t+\beta_2(OTHLOAN)_t+\beta_3(OTHOPQ)_t+\beta_4(EBT)_t+\beta_5$$

$$(NONINT)_t+\beta_6(CORDEP)_t+\beta_7(INTRISK)_t+\beta_8(LNASSETS)_t+\acute{\varepsilon}_t \qquad (2)$$

where EXVAL represent excess equity charter value which is found by subtracting book value of equity from market value of equity. TRADE, OTHLOAN and OTHOPQ are categorized as opaque variables as same as in function (1). Control bank variables are also included into model to see their contribution on EXVAL. EBT which is used as dependent variable became independent bank variable in this

model. NONINT represents non-interest income, CORDEP is used for core deposits, INTRISK is interest risk and finally LNASSETS is total assets expressed in logarithmic form to capture the growth effects (Katircioglu, 2009). Then the following hypothesis will be developed:

H_0 = Opaque assets do not export negative impact on excess bank equity charter value.
H_1 = Opaque assets export negative impact on excess bank equity charter value.

Finally, the last model in this study is constructed in order to identify whether opacity among Turkish banks contributing to price synchronicity in the market. In recent studies, higher R^2 is proven to create price synchronicity (Morck et al, 2000). In order to determine if opaque variables cause price synchronicity, the model is suggested in a functional way as follows:

$$PSYNC = \beta_0 + \beta_1(TRADE)_t + \beta_2(OTHLOAN)_t + \beta_3(OTHOPQ)_t + \beta_4(EBT)_t + \beta_5$$
$$(NONINT)_t + \beta_6(CORDEP)_t + \beta_7(INTRISK)_t + \beta_8(LVRG)_t + \acute{\varepsilon}_t \qquad (3)$$

The dependent variable PSYNC represents price synchronicity. In order to come up with the variable; market betas are calculated by using daily price returns for each quarter among the data set for all 10 banks that are publicly traded. Istanbul Stock Exchange (ISE) equal weighted index is used as market proxy. From the generated betas, R^2s are computed. The logistic transform; $\log (R^2/1-R^2)$, is used as PSYNC and as an addition to the second model, bank leverages (LVRG) is also added as bank control variable. Therefore following hypothesis will be developed:

H_0 = Opaque assets do not cause price synchronicity among stock exchange market.
H_1 = Opaque assets causes price synchronicity among stock exchange market.

Chapter 5

EMPIRICAL RESULTS

5.1 Unit Root Stationarity Tests

Panel unit root tests are conducted on all the variables that are been used in this study. In total, 13 different variables are used and they are classified into two groups as asset items and non-asset items. All the asset and non-asset variables have been tested in order to determine their stationarity and alpha levels by using E-Views 6 software. The test is done by applying both level and 1st difference unit root test in their individual intercept and trend form for the mentioned variables and it is repeated by removing trend and finally removing both intercept and trend. Unit root test is performed by taking Levin, Lin and Chu (LLC), Im, Peseran and Shin (IPS) Maddala Wu (M-W) and Breitung (BR) methods. Table 2 represents the results for each different test methods. Trading assets (TRADE) are measured in intercept and trend form and it turns out to be stationary at alpha 10 percent according to LLC (2002) and BR (2000) tests but it is non-stationary as reported by the IPS (2003) and M-W (1999) tests. When the intercept is removed and the variable is checked by its level form, TRADE becomes stationary at alpha 10 percent in IPS test and further when the level is removed as well and tested as none, we see that it is stationary in M-W test at alpha 1 percent.

Excess bank equity charter value (EXVAL) is found statistically significant in LLC test at alpha 5 percent however according to IPS, M-W and BR tests our variable is not stationary. When the trend is removed it becomes stationary at alpha 10 percent in IPS test and it turns out stationary at alpha 1 percent as the intercept is also removed according to M-W test.

Transparent assets (TRANSP) are stationary as it is stated in LLC test at alpha 5 percent but its non-stationary based on the other methods and it is also non-stationary when the trend and intercepts are removed. Even though the outcome from other tests point that the variable is not stationary, since it is found stationary in LLC test, we can empirically conclude that the transparent assets are stationary.

All other opaque assets (OTHOPQ) is found stationary in all methods of the unit root test when the test is conducted at intercept and trend and intercept, although OTHOPQ is not stationary as the intercept is removed, it is obvious that the variable is stationary. Price synchronicity (PSYNC) and earnings before taxes (EBT) is tested and they are stationary at all of the tests in intercept and trend, intercept and without intercept steps. When the rest of table is examined, it can be observed that all the variables are found stationary in their level forms with an exception of all other loans (OTHLOAN). When this variable is tested; it is detected that in any of the alpha levels and also with different test methods it is not stationary. However unit root result with first difference for all other loans is proven to be stationary and therefore, as this independent variable is regressed among the models, it is going to be taken in the first difference. Table 2 is also providing first difference results for our variables used.

Table 2. Panel Unit Root Tests

Levels Variables	LLC	IPS	M-W	B
TRADE				
τ_T	-1.52***	-0.21	24.08	-1.57***
τ_μ	-2.53*	-1.32***	24.11	-
τ	-4.84*	-	52.69*	-
EXVAL				
τ_T	-2.23**	0.48	24.08	-0.92
τ_μ	-2.53*	-1.32***	24.11	-
τ	-4.84*	-	52.69*	-
TRANSP				
τ_T	-1.75**	-0.13	22.84	-0.06
τ_μ	-0.12	3.10	6.72	-
τ	5.60	-	0.96	-
OTHOPQ				
τ_T	-3.57*	-1.90**	41.67*	-2.17*
τ_μ	-2.48*	-1.51**	33.99**	-
τ	-0.92	-	21.34	-
PSYNC				
τ_T	-5.37*	-4.61*	86.86*	-1.03
τ_μ	-6.54*	-6.84*	94.18*	-
τ	-4.81*	-	93.81*	-
EBT				
τ_T	-6.67*	-1.22*	112.09*	-2.46*
τ_μ	-8.93*	-5.60*	130.09*	-
τ	-11.27*	-	145.37*	-
OTHLOAN				
τ_T	-0.71	-0.12	26.56	1.14
τ_μ	-0.42	-2.67	8.36	-
τ	-4.91	-	4.51	-

Table 3. Panel Unit Root Tests (Continued)

Levels Variables	LLC	IPS	M-W	B
NONINT				
τ_T	-13.46[*]	-7.29*	112.35[*]	1.14
τ_μ	-7.37[*]	-5.18[*]	57.20[*]	-
τ	-1.05	-	16.46	-
CORDEP				
τ_T	-1.14	-1.24	14.26	-2.26**
τ_μ	-3.44	-6.10	0.75	-
τ	7.79	-	0.32	-
INTRISK				
τ_T	-1.38[***]	-0.00	16.64	-3.86*
τ_μ	-1.41	3.81	3.87	-
τ	5.01	-	0.72	-
LVRG				
τ_T	-2.54*	-1.54***	40.81*	-0.37
τ_μ	-3.72*	-2.74*	35.52**	-
τ	-0.99	-	18.08	-
LOGASSETS				
τ_T	-1.79**	0.06	16.32	-1.59
τ_μ	-0.16	3.92	4.06	-
τ	8.74	-	0.18	-

Table 4. Panel Unit Root Tests (Continued)

First Difference Variables	LLC	IPS	M-W	B
TRADE				
τ_T	-6.18*	-5.38*	65.28*	-2.07**
τ_μ	-6.94*	-9.09*	102.73*	-
τ	-12.44*	-	138.37*	-
EXVAL				
τ_T	-4.45*	-0.93	27.00	-0.58
τ_μ	-5.50*	-3.74*	38.00*	-
τ	-9.19*	-	87.70*	-
TRANSP				
τ_T	-9.74*	-4.18*	124.96*	-3.22*
τ_μ	-12.53*	-10.50*	144.91*	-
τ	-13.31*	-	158.20*	-
OTHOPQ				
τ_T	-5.54*	-1.60***	107.55*	-0.51
τ_μ	-11.73*	-9.33*	133.05*	-
τ	-14.77*	-	169.66*	-
PSYNC				
τ_T	-8.37*	-12.29*	950.03*	-6.27*
τ_μ	-13.18*	-14.52*	637.00*	-
τ	-18.16*	-	276.31*	-
EBT				
τ_T	-6.67*	-1.21	112.09*	-3.53*
τ_μ	-8.93*	-5.60*	130.03*	-
τ	-11.27*	-	145.37*	-
OTHLOAN				
τ_T	-23.40*	-9.22*	119.03*	-3.32*
τ_μ	-25.35*	-17.49*	148.67*	-
τ	-17.72*	-	154.38*	-

Table 5. Panel Unit Root Tests (Continued)

First Difference Variables	LLC	IPS	M-W	B
NONINT				
τ_T	-10.56*	-1.39***	110.09*	-2.07*
τ_μ	-12.60*	-5.25*	135.02*	-
τ	-14.03*	-	159.82*	-
CORDEP				
τ_T	-6.90*	-2.97*	108.41*	-1.54***
τ_μ	-8.13*	-7.10*	106.61*	-
τ	-7.44*	-	103.54*	-
INTRISK				
τ_T	-7.06*	-3.10*	89.79*	-4.54*
τ_μ	-9.03*	-6.84*	104.91*	-
τ	-10.78*	-	118.95*	-
LVRG				
τ_T	-6.86*	-3.24*	76.12*	-1.90**
τ_μ	-9.41*	-7.88*	104.35*	-
τ	-13.72*	-	154.40*	-
LOGASSETS				
τ_T	-6.44*	-2.85*	92.12*	-4.18*
τ_μ	-9.60*	-7.51*	129.61*	-
τ	-8.37*	-	106.50*	-

Source: TRADE is trading assets. EXVAL represents excess bank equity charter value. TRANSP is derived from summation of transparent assets. OTHOPQ is all opaque assets. PSYNC represents price synchronicity. EBT represents earnings before interests and taxes as net amount. OTHLOAN represents all other loans. NONINT represents noninterest income. CORDEP is core deposits. LVRG represents bank leverage. LOGASSETS represents logarithmic form of total assets. τ_T represents the most general model with a drift and trend; τ_μ is the model with a drift and without trend; τ is the most restricted model without a drift and trend. Optimum lag lengths are selected based on Schwartz Criterion. * denotes rejection of the null hypothesis at the 1% level. Tests for unit roots have been carried out in E-VIEWS 6.

5.2 Impact of Opacity on Bank Profitability

Three models have been developed in order to investigate the impacts of opaque assets on bank profitability relative to transparent assets, relationship between bank opacity and valuation discount and finally how investments on opaque assets are affecting price synchronicity among the market.

For the first model which measures the impacts of opacity on bank profitability, earnings before taxes (EBT) is used as dependent variable and opaque independent variables are regressed to see their influence on earnings before net income. Those opaque independent variables are consisting from trading assets (TRADE), all other loans (OTHLOAN) and all other opaque assets (OTHOPQ). On the other hand, transparent assets (TRANSP) are added into the regression to be able to make a comparison between those opaque assets and transparent assets.

Cross-section panel regression results show that (Table 6) all the variables are statistically significant at alpha 1% with a weighted Durbin Watson stat of 1.43. So, it can be concluded that there is not an autocorrelation problem in the model. According to coefficient results of the regression, it has been observed that trading assets have a positive coefficient by 0.07 meaning that; if trading assets increase by one unit, then earnings before taxes and income is going to increase by 0.07 units. After determining that increase in trading assets have a positive relationship with EBT, we see that the coefficient outcome of all other loans is 3.22 and it proves that it has a significant impact on before tax income because one unit of positive change is going to lead EBT to alter 3.22 units. Also our last opaque variable OTHOPQ has a positive correlation with before tax income and one unit of increase in those other

opaque assets will cause 0.011 units of more before tax income among our model. As a result, it is certain that as banks are investing on opaque natured assets, their earnings before income and taxes are going to increase. However, it is still necessary to make the same regression analysis by using EBT as a dependent variable and less riskier assets as independent variable to compare its impact on banks' profitability to opaque assets. Such comparison is going to help us to understand why banks' investment decisions and structure can be more opaque concentrated. Therefore TRANSP is added to our same model and it is regressed together with other variables. As a result, it is detected that having transparent assets are also making a positive contribution. Regression result for transparent asset variable is 0.07 which means a one unit increase in transparent assets providing EBT to increase by 0.07 units. As findings are studied, it can be seen that investing on transparent assets and keeping them in bank balance sheets are increasing before net income almost as much as trading assets and other opaque assets in our model but with a slightly difference. On the other hand, change in all other loans are providing a lot more source of income for the banks relative to transparent assets and therefore, we can conclude that in total, opaque assets are associated with higher profitability. Table 6 designating the mentioned findings in the model in which the relationship between opacity and banking profitability is investigated. Therefore, we can reject our null hypothesis and accept our alternative hypothesis which is opaque assets export positive impact on profitability.

Table 6. Profitability and Opacity

	Coefficient	Prob.
TRADE	0.065542	0.0000
D(OTHLOAN)	3.218134	0.0001
OTHOPQ	0.011422	0.0043
TRANSP	0.075327	0.0000
Adjusted R^2	0.819326	
F-statistics	50.9295	
Durbin-Watson stat	1.502393	

Source: Impact of opaque assets on bank profitability. The table represents findings of earnings before taxes and extraordinary items in comparison to opaque assets. The model is regressed by Cross-section SUR the estimation is made by using 16 quarter periods with a cross section number of 10. All the estimations are generated from E-Views 6 software.

5.3 Valuation Discounts

After examining banks' opaque asset concentration on their financial structures and its impacts on their profitability, it has been concluded that banks' choices regarding opaque assets are generating more profit relative to transparent assets. Therefore it can be expected that opaque concentrated assets should carry higher valuation discount. That means opaque asset investments are going to cost more because of their risk level and such cost will be reflected as higher valuation discount. In order to prove that opaque assets have a negative influence on banks' capital and in turn it'll lead a higher discount, excess amount of equity value (EXVAL) is calculated by subtracting bank value of equity from market value of equity. EXVAL is used as dependent variable in the model and it is regressed among our opaque oriented assets. As in the previous model opaque assets are composed of trading assets (TRADE), all other loans (OTHLOAN) and other opaque assets (OTHOPQ). In the meantime, bank variables are again used as control variables to see their impacts on

valuation discount. These control variables are earnings before taxes (EBT), non-interest income (NONINT), core deposits (CORDEP), interest rate risk (INTRISK) and bank size (LOGASSETS).

The regression results are given in table 7. If opaque assets are mean to be costly in terms of capital, then they should make a negative impact on EXVAL. Note that out of three opaque categorized assets, two of them have a negative coefficient. OTHLOAN and OTHOPQ variables meet expectations in this regard. TRADE on the other hand, carries a positive influence on excess equity value. Trading assets are identified as an opaque asset variable in this study because as it mentioned at chapter 1, trading assets are short term and highly liquid therefore it can easily be removed or changed between reporting periods of banks' financial statements. However, regression outcome for trading assets demonstrates that in our model TRADE has a prob. value of 0.0015 which means the variable is statistically significant at alpha 1% and coefficient is 0.368452. A positive coefficient indicates that each unit of increase in trading assets provides an increase in excess equity value of 0.37. So, according to outcome we have, it can be considered that TRADE creates a benefit of capital rather than cost and this leads a lower discount in return. When the other two main components of opaque assets are analyzed, they indicate very opposite of trading assets' condition. OTHLOAN has a significant magnitude of negative coefficient with a significance level of alpha 1 percent and it points that only one unit increase in all other loans cause a decrease of EXVAL by 9.072378. Same effect as other loans into excess equity can be seen from other opaque assets as well. OTHOPQ is also statistically significant with 0.0353 prob value at alpha 5 percent. Coefficient value of negative 0.057507 indicate that one unit of increase in OTHOPQ leads cost of capital of coefficient amount.

Table 7. Valuation Discount and Opacity

	Coefficient	Prob.
Asset Variables		
TRADE	0.368452	0.0015
D(OTHLOAN)	-9.072378	0.0000
OTHOPQ	-0.057507	0.0353
Bank Variables		
EBT	3.163208	0.0000
NONINT	1.364274	0.1345
CORDEP	0.122997	0.0030
INTRISK	0.087641	0.0080
LOGASSETS	123.0152	0.1926
Adjusted R^2	0.791636	
F-statistics	61.73860	
Durbin-Watson stat	1.410594	

Source: This table provides regression results regarding opacity and valuation discount by using EXVAL as dependent variable. The model is regressed by Cross-section SUR the estimation is made by using 16 quarter periods with a cross section number of 10. All the estimations are generated from E-Views 6 software.

With exception of NONINT and LOGASSETS, all control variables are statistically significant as reported on Table 7. EBT, CORDEP and NONINT are significant at alpha level 1 percent. The signs of the coefficients are as guessed with the exception of INTRISK. Interest rate risk is calculated by taking the absolute difference between assets and liabilities that have maturity of less than one year therefore an increase in INTRISK should decrease our equity value and increase the valuation discount. However, regression results show that the variable has a positive sign of coefficient and in the case of Turkey between the years of 2003 and 2008; a unit of increase in the interest risk also increases EXVAL. Earnings before taxes has got positive coefficient as well and it makes sense to assume that profitability makes equity value

higher. Compare to other control variables, EBT provides greater impact on EXVAL. A unit increase in before taxes income, leads 3.163208 units equity value. Core deposits also found to make a positive affect with a coefficient 0.122997 on EXVAL. Therefore, we can reject our null hypothesis and accept our alternative hypothesis which is opaque assets export negative impact on excess bank equity charter value.

5.4 Price Synchronicity

As it mentioned before, stock price synchronicity is associated with poor market and firm level information. In the previous models, it has been proved that banks are relying on opaque assets more than transparent assets because of their greater returns. Also it has concluded that opaque assets cause cost of capital and such cost will trigger higher valuation discounts. In this third and final model, price synchronicity will be investigated to identify the market's behavior regarding banking industry's opaque nature. The hypothesis estimates that as the investments on opaque assets increase, there will be further non transparency and it will create a condition of being inaccessible to understand and evaluate the true situations that firms are in (banks) which in turn is going to increase price synchronicity. Therefore, higher synchronicity is an indication of greater likelihood of systematic risk and market failure. The model is developed between the years of 2003 and 2008 as in the previous models.

PSYNC is taken as dependent variable in the model. A high R^2 is a sign of increased level of price synchronicity and after come up with the R^2 values of each bank; a logistic transform is conducted in order to generate our dependent variable. PSYNC is regressed with our independent variables that are classified as opaque assets. Those opaque independent variables are composed of TRADE, OTHLOAN and

OTHOPQ. EBT, NONINT, CORDEP, LVRG and LOGASSETS are set as our control variables in order to observe their impact on synchronicity.

Regression's findings can be checked from table 8. As the table demonstrates, opaque asset variables' coefficients are all found in positive numbers. This implies that there is a positive relationship between opacity and price synchronicity as the hypothesis suggested. Although TRADE variable is not statistically significant, it increases PSYNC by 3.28 units as unite of increase occur. OTHLOAN on the other hand, proves that it is statistically significant at alpha level 1 percent. A unit increase in OTHLOAN increases price synchronicity by 0.002497 according to produced regression results. Among our opaque asset variables, most significant impact toward price synchronicity is contributed by OTHOPQ, A unit of increase in other opaque assets increases price synchronicity by 3.3. OTHOPQ is also statistically significant at alpha 1 percent.

As it comes to bank variables, EBT is statistically significant at alpha 1 percent and has a negative coefficient which implies that an increase in earnings before taxes is going decrease price synchronicity. INTRISK has also negative sign in it coefficient when it regressed with PSYNC and again it implies that as interest risk rises by one unit, price synchronicity will decrease. NONINT and CORDEP variables showed that an increase in their shares increases price synchronicity as well although those variables are found statistically non-significant. LVRG and LOGASSETS are found statistically significant at alpha 1 percent and alpha 10 percent respectively. Their coefficients indicate that they are contributing price synchronicity positively. Therefore, we can reject our null hypothesis and accept the alternative hypothesis which is opaque assets cause price synchronicity among stock exchange market.

Table 8. Price Synchronicity and Opacity

	Coefficient	Prob.
Asset Variables		
TRADE	3.280000	0.2060
D(OTHLOAN)	0.002491	0.0028
OTHOPQ	3.300000	0.0001
Bank Variables		
EBT	-0.000478	0.0019
NONINT	0.000471	0.3020
CORDEP	1.420000	0.5547
INTRISK	-5.83000	0.0126
LVRG	5.041279	0.0000
LOGASSETS	0.114710	0.0619
Adjusted R^2	0.773339	
F-statistics	55.34810	
Durbin-Watson stat	1.645430	

Source: This table provides regression results to show the relationship between price synchronicity and opacity by using PSYNC as dependent variable. The model is regressed by Cross-section SUR the estimation is made by using 16 quarter periods with a cross section number of 10. All the estimations are generated from E-Views 6 software.

As a result of the regression analysis, it can be concluded that opaque assets are creating systematic risk among the market since there is a positive relationship between opaque assets and price synchronicity. Prior literature studies are confirmed that opacity creates systematic risk. In a market where the firm level information is adequate and shareholder protection is provided, R^2s are calculated to be smaller. Any circumstance that makes positive impact on R^2 such as opacity can be considered as a trigger of systematic risk in that market. As the investors don't evaluate the industry as it is supposed to be, then in a time of recessions, market prices will move based on perception change regardless of true position and riskiness of banks.

Chapter 6

CONCLUSION AND POLICY IMPLICATIONS

6.1 Conclusion

Previous studies reveal that opacity is more concentrated in banking industry than other industries. For the Turkish banking industry, 10 out of 15 traded banks are investigated in order to determine banking industry's profitability, valuation discounts and price synchronicity in such opaque environment. The sample period is identified between the years of 2003 and 2008 and quarterly banking data has been used in nominal euro terms.

First of all, it has been determined that opaque assets are more profitable than transparent assets since there is a higher contribution made by opaque assets on earnings before taxes. The fact that opaque assets are more profitable, it pushes banks to invest more on opaque assets and less on transparent assets.

As cost of capital increases, valuation discount will be higher. If a company's cost of capital increases, shareholders are going to demand for more return. Present study investigated this phenomenon by implying that opaque assets cause cost of capital to increase and in turn valuation discounts will rise as well. This suggestion is empirically proved by regressing opaque variables with excess equity capital.

With higher profitability and valuation discounts are taken into account, this study also examined if bank opacity creates price synchronicity as well. As the prior researches concluded, firms with higher R^2s bring higher price synchronicity into markets. The analysis revealed that price synchronicity is greater and R^2 of banks tend to increase in Turkish markets together with opacity.

6.2 Implications

Turkish banking industry has experienced several banking oriented financial crises in the last decade. Even though it showed a significant progress and solid performance afterwards, it is crucial to make society feel safe about their banking system. If people lose trust regarding their intermediary function of the financial system, then there is no doubt that economy will be disrupted. Therefore, regulatory authorities keep regulate banks to take them under control. Besides regulating and monitoring banks, deposit insurance assures public that their money is under the protection of government in a case of bankruptcy. However, banking industries including Turkish banking system have opaque nature. Such opacity is derived from discrete loan agreements that people cannot be aware of therefore, it is difficult to identify a bank's risk level compare to other firms. Furthermore, other opaque assets such as mortgage backed securities, commercial real estate loans, residential real estate loans and other non-classified loans climbing opacity among banking industry even more. In order to cope with opacity, more transparency must be promoted. As it demonstrated, opacity is creating more synchronicity; on the other hand, transparency is going to increase the likelihood of disclosure of information. Having sufficient information regarding a bank's present operations will enable markets to predict future events more accurately.

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