COMPARISON OF LOAN DEFAULT: PARTICIPATION VERSUS CONVENTIONAL BANKS IN TURKEY

A Master's Thesis

by

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Ankara
August 2015

To My Family

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Graduate School of Economics and Social Sciences
of
İhsan Doğramacı Bilkent University

by

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ABSTRACT

COMPARISON OF LOAN DEFAULT: PARTICIPATION VERSUS CONVENTIONAL BANKS IN TURKEY

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August 2015

In this study, I compare the default rates of firm loans issued by participation and conventional banks operating in Turkey by using survival analysis techniques for the period January 2011 - December 2012. Banks provided more than 4 million loans to firms during this period. I find that participation loans are more likely to default, controlling for borrower, loan and bank characteristics. However, loans of firms working with only participation banks are less prone to default compared to loans of firms working with both participation and conventional banks. The default rate of participation loans are found to be higher than that of conventional loans for the firm that borrows from both type of banks. Loans are less likely to default during Ramadan. It is found that large firm loans survive longer in cities where the population is high, where there are proportionately more mosques and more Al-Quran course participants per population.

Keywords: Duration Analysis, Turkish Participation Banks, Loan Default

ÖZET

TÜRKİYE'DE KATILIM BANKALARI VE GELENEKSEL BANKACILIK: KREDİ TEMERRÜT KARŞILAŞTIRMASI

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Bu çalışmada,sağkalım analizi teknikleri kullanılarak Türkiye'deki katılım bankacılığı ve geleneksel bankacılık firma kredilerinin temerrüt olasılıkları 2011 Ocak-2012 Aralık dönemi içerisinde karşılaştırılmıştır. Bankalar söz konusu dönemde, firmalara 4 milyonun üzerinde kredi tahsis etmişlerdir. Banka, borçlu ve kredi karakteristiklerinin etkisi kontrol edildiğinde, katılım kredilerinin temerrüt olasılığı, geleneksel kredilere göre daha fazladır. Sadece katılım bankalarından kredi kullanan kişilerin kredi temerrüt olasılığı, her iki banka tipinden kredi kullananların kredi temerrüt olasılığından düşüktür. Her iki banka tipinden de borç alanlar incelendiğinde, katılım kredilerinin temerrüt olasılıkları aynı şekilde görece yüksektir. Büyük krediler incelendiğinde, kredi temerrüt olasılığı nüfusun fazla olduğu, kişi başı cami oranının yüksek olduğu ve kişi başı Kuran kursu katılımcısının fazla olduğu illerde daha düşüktür.

Anahtar Kelimeler: Sağkalım Analizi, Türk Katılım Bankaları, Kredi Temerrüt

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CHAPTER 1

INTRODUCTION

The assets of the global Islamic finance industry have a compound annual growth rate of 17% between 2009 and 2013. The value of its assets is estimated to be USD 1.87 trillion in the first half of 2014 (Islamic Financial Services Board, 2015). The expansion of Islamic Banks raised several questions in the minds of both academicians and practitioners. Questions, including but not limited to what products Islamic banks offer that are not offered by conventional banks, whether Islamic banks differ in terms of efficiency, risk and other theoretical or practical manners. In this thesis, one of these questions, whether Islamic and conventional banks are different in terms of credit risk, is tried to be answered using the firm loans issued by the commercial and participation banks operating in Turkey for the period 2011-2012.

The contracts offered by Islamic and conventional banks seem to be similar other than Sharia compatibility and some operational nuances. Sharia rules forbid interest rate, gambling, too speculative actions and investment on banned products by Islam (Khan, 2010). One example of operational difference of Islamic banks from conventional banks is that they make a contract to buy a product on behalf of customer, rather than directly providing loan to borrower. As Baele et al (2014) mention, Islamic and conventional banks offer similar credit contracts. Then, there is a question of who prefers to get loans from Islamic banks and whether there are differences in the default

probability of borrowers of two types of banks. Baele et al. (2014) report that religious beliefs of the borrowers are important in their bank choice in Pakistan. In terms of default probability, they find that Islamic loans are less prone to default, show lower probability of default during Ramadan, and in big cities where conservative parties are prominent in Pakistan. Ongena and Şendeniz-Yüncü (2011) investigate who is getting loans from these banks in Turkey and find that young firms, firms with multiple bank relationships, industry based firms and transparent firms are more likely to engage in Islamic banks in Turkey. Several questions can be raised based on their findings. For example, do young firms willingly engage in Islamic banks or do not they have any other option? That is, it might be the case that Islamic banks are dealing with firms not accepted by conventional banks due to risk concerns. The findings of this thesis will provide some answers to these questions.

The participation banks in Turkey are designed as Islamic banks. They are separated from deposit banks by banking law Nr. 5411 (2005) such that they grant participation loans and collect participation funds. Similar to Baele et al (2014), in this thesis, I test three hypotheses using the loans issued by banks operating in Turkey. The first hypothesis is that loans issued by participation banks are less likely to default than those issued by conventional banks, controlling for borrower, bank and loan characteristics. The second hypothesis is that if a borrower gets loans from both types of banks, he is more loyal to Islamic loan, i.e., he is more likely to pay back his loan from participation bank. Using mosques per population in a city, Al-Quran course participants per population in a city and Ramadan month as measures of piousness, it is hypothesized that the higher the piousness, holding all else constant, the lower the

probability of default. Therefore, the tests of these hypotheses for the commercial and participation banks in Turkey would help us to understand credit risk dynamics inherent in these banks. The findings of this study can be used by not only regulators but also by market participants and other bank stakeholders. I used survival analysis techniques to test the aforementioned hypotheses. Survival analysis provides the interpretation of likelihood of default while it takes survival time into account.

I employ data set from Central Bank of Republic of Turkey. It includes firm loans provided by participation and conventional banks during the sample period January 2011 - December 2012. The final sample includes only TRY denominated originated loans, resulting in more than 18 million loan-month observations with 335,088 borrowers getting loans from 4 participation and 40 conventional banks. Throughout the thesis, participation loans (banks) and Islamic loans (banks) are used interchangeably.

I find that participation loans are more likely to default compared to conventional loans. Loans of firms working with only participation banks are less prone to default compared to loans of firms working with participation and conventional banks. When the firms that borrow from both types of banks are examined, loans belonging to participation banks are again more prone to default than conventional loans. Among the firms that borrow from both types of banks, if a firm initially takes a loan from conventional bank, then from participation bank, the loan of firm is more inclined to default suggesting that borrowers get their loans where they are able to and if they are rejected at some point they go for participation banks. Large firm loans

survive longer in cities where the population is high, where there are proportionately more mosques and more of Al-Quran course participants per population.

The thesis is organized as follows. In the next chapter, the terminology and different financial instruments in the context of Islamic banking is clarified. In chapter 3, how customers perceive Islamic banks is explained. In chapter 4, efficiency comparison of Islamic and conventional banks is reviewed. These studies related to the main focus of this thesis namely credit risk comparison of these banks are presented in chapter 5. In chapter 6, Turkish banking system is examined. Hypotheses, methodology and data are discussed in Chapter 7. Empirical findings, robustness checks are in chapter 8. Chapter 9 concludes the thesis.

CHAPTER 2

ISLAMIC ECONOMICS AND ISLAMIC BANKING

2.1 Islamic versus Conventional Banking

The perspective of Islamic finance sets the ground for Islamic banks. Hence, how Islamic banks are perceived in the context of Islamic economics provide valuable insight for the purpose of comparison.

Islamic banks follow Sharia principles namely Al-Quran, Hadith (what Prophet said word by word), Ijma (consensus of pioneer Muslims or following scholars) and Qıyas (reasoned comparison). The major Sharia principles in the context of economics are that interest rate in any form, gambling, too speculative actions and religiously banned products' investments (such as alcoholic drink, pork etc.) are forbidden. The prohibition of interest causes Islamic banks to be called "interest free banking" as stated in Khan (2010). The money itself is not a subject of the trade in case of Islamic banking (Özulucan and Deran, 2009) rather money is a tool to finance projects. The agreed ratio is pre-determined. Gharar, i.e. excessive uncertainty in transaction, is forbidden in Islam. This means that speculative derivatives instruments cannot be used. The contract arrangement does not change with the changes in dynamic environment. These characteristics differentiate Islamic banks from conventional banks. Islamic banks are also different in terms of their moral aspects, ethical concerns, social

dimensions (Akkizidis and Khandelwal, 2008). They argue that moral dimension is more prominent for Islamic banks. They also plausibly add that Islamic banks have ethical and social concerns in addition to financial efficiency. Ali et al. (2010) argue that ad hoc basis of contracts, operational costs specific to Sharia compliant contracts and divergence of scholars on the topic of derivatives cause some deficiencies for Islamic banks. The current conditions for Islamic banks such as inadequate money and secondary security markets in addition to very standard risk management (due to derivative limitations) constrain them compared to conventional banks.

There are studies that investigate whether Islamic banks follow Sharia rules (Islamic moral code and religious law) or whether they find ways to manipulate such rules. Khan (2010) reports that the issuance of murabaha may be against the Sharia rule of risk taking. Advocates argue that use of murabaha with the advancement of banks would lessen, yet it is not observed after a decade. It is interesting that even non-profit making Islamic Development Bank highly utilizes non-Profit Loss Sharing instruments (which are called weakly Islamic by conservative ulema –religious scholars-). They make commodity placement transactions such that Islamic bank buys commodity from third party then sells by adding markup cost at deferred payment to borrower (conventional bank or Islamic bank) and borrower sells the same commodity to third party at cost price. Since there occurs a trade and all the parties hold risk (which is almost zero by the way), this is argued that it satisfies Sharia rules. Conventional banks create similar instruments with the markup cost such as LIBOR rate. Khan (2010) also explains some cheatings on accounting information by using directly interest based instruments. However, such deceptions cannot be attributed to all Islamic banks yet it

raises suspicion. However, Khan(2010) concludes that Islamic banks fail on many subjects in terms of Sharia compliance. Sharia boards that are to guide Islamic banks seem to be there just to certificate the debatable weak Islamic instruments and suspicious bank activities.

2.2 Instruments Issued by Islamic Banks and/or Under Islamic Rules

Hassan et al. (2007) classify Islamic banking products as profit and loss sharing (PLS) contracts and non-profit and loss sharing agreements (cost plus transactions in general).

Murabaha is cost plus transaction. Bank buys the asset on behalf of borrower, after that bank sells the asset at higher price to the borrower via deferred or one-time payment.

Mudaraba is a PLS contract between bank and entrepreneur. There is predetermined profit sharing agreement. Bank provides capital only, while entrepreneur provides effort. In case of bankruptcy, bank can not impose any penalty unless manager is found to be intentionally misbehaved. Presley and Sessions (1994) construct a model to show that mudaraba can be more effective than incentive compatible interest contract under certain conditions. Their model is based on information asymmetry between manager and investor and moral hazard problem after project starts. PLS contract would have a problem of managerial effort in bad states, while interest contract would have a problem of capital investment in bad states. The reason is that effort comes from the manager while capital is given by the bank. Hence during stressed periods, the

manager avoids providing extra effort in PLS. In the interest contract, the manager makes an optimization for investment and effort because the return of manager is connected to return of investment. During stressed periods investment is reduced. It is shown that mudaraba would make manager's compensation dependent on the outcome of project.

Musharaka is also a PLS contract in which the profit shares should be determined prior to agreement, but this time both parties are active in management decision and provide capital for the project.

There are other non-PLS instruments as well (Wilson, 2011). Some of the popular ones are Salam, İjara leasing and İstisna. Salam refers to financier's advance payment for future delivery. However, nuance is that quality, time and location of delivery with transportation arrangement should be pre-determined without any ambiguity to prevent speculation. Ijara can be considered as leasing arrangement where the ownership remains (or pre-determined sale to lessee at the end of leasing period) yet the usage is transferred in exchange for a rent. Damage or loss of product belongs to lessor, if the damage is not lessee's fault. The leasing should be in purpose of trade not of speculation. Istisna means buying the product on behalf of a third party. It is used for special products.

There are also other products (sukuk-Islamic bonds, Wakala-empowerment contract acting on behalf of third party) to provide financing needs of various parties. Sukuk is basically certificate to represent ownership rights for the projects, tangible

assets and usufructs (Mauro et al., 2013). Sukuk holders share the profit of the underlying asset. Wakala is used for fee based transactions.

There are some studies examining whether products issued by Islamic banks solve some asymmetric information problems (Aggarwal and Yousef, 2000). They point out the debt-like instrument nature of Islamic banks. They construct a model based on agency problem where banks have bargaining power in case of default. They find that optimal contract in such a setting would be murabaha contract. Therefore more severe agency problem would result in more use of such contracts. They argue that increase in competition between banks may bring about PLS financing. Prohibition of charging interest is also considered as transfer of bargaining power to entrepreneurs meaning that it changes distribution of wealth. They also state the short term nature of lending is another result of severe agency problem that Islamic banks face with.

In general, Sharia boards are in place for Islamic banks (Hassan et al., 2007) to monitor whether their products are compatible with Sharia law. These boards are found to be effective when they act as supervisory rather than advisory boards (Mollaha and Zamanb, 2015).

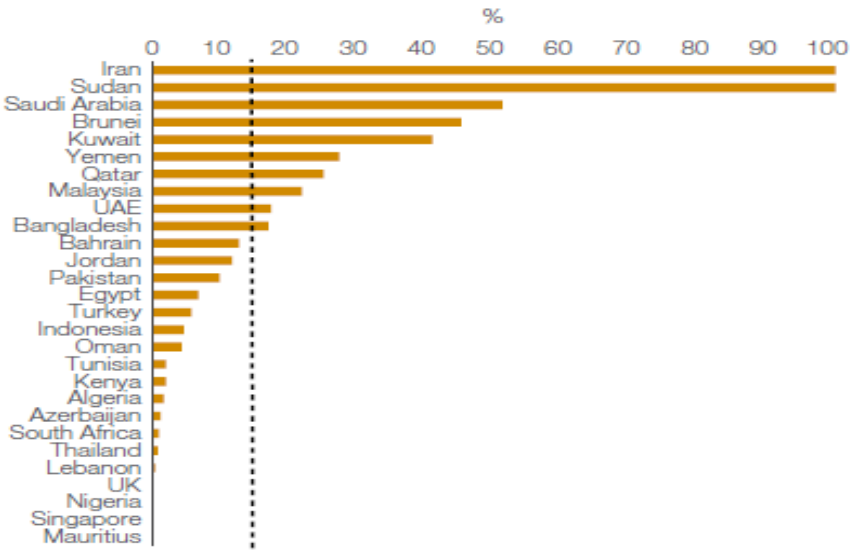
2.3 History and Today of Islamic Banking

Islamic banking had started in the mid 1940s in Malaysia and then Pakistan in the late 1950s. Egypt experienced this type of banking with the establishment of Mit Ghamr Savings Bank in 1963) and Nasser Social Bank in 1971 (Otiti, 2011). In 1973, Islamic Development Bank was founded with the purpose of economic improvement

and social progress of member countries. Since its establishment, Islamic banking has been spread around the world.

As shown in figure 1, Iran and Sudan utilize Islamic banking solely, while the other countries have dual banking structures where the share of Islamic banks in terms of total banking assets change between 0% and 51.3%. The share of participation banks in total banking assets in Turkey is around 5.7% in the first half of 2014. Islamic financial services industry stability report (2015) also emphasizes that there is a strong government support in Turkey for the development of the participation banks. The share of participation banks in the banking sector is targeted to be 15% in 2023.

Figure.1 The shares of Islamic Banks in the Banking Sector by Country



Source: Islamic Financial Services Industry Stability Report 2015

Islamic banks had started to operate in Turkey with the establishment of two participation banks in 1985 (Özulucan and Deran, 2009). They are different in the sense that they can not open regular deposit accounts or lend loans in Turkey. They are permitted to open private current account or participation accounts on liability side and provide financing products that are compatible with Sharia rules. Before 2005, these banks were called as special finance houses. After 2005 with Banking Law No.5411, they are designated as participation banks.

CHAPTER 3

ISLAMIC BANKING AND AWARENESS

How customers perceive the so called Islamic banks would definitely matter in terms of risk analyses. The credentials come from procedures followed and instruments used by Islamic banks. Reputation is something vulnerable and hard to recover and the banking industry can be considered as trust mechanism. In the context of Islamic banking, reputation is linked to perception of the customers about Sharia compliance of products that Islamic banks use.

3.1 Awareness

It is important to know the clients of Islamic banks and whether they are different from those of conventional banks. If only Muslims are the clients of Islamic banks, then these banks have a diversification problem in their customer pool. They are in a segmented market where only Muslims invest in, if they do not attract non-Muslims or if individuals are not aware of their products. The empirical findings suggest that both Muslims and non-Muslims are aware of their products and use them not only for religious reasons but also economic reasons.

Rammal and Zurbruegg (2007) investigate awareness of Islamic banking products among Muslims in Australia. Majority of respondents are willing to adopt helal products of Islamic banks, but they are not well informed about products such as possibility of loss in PLS arrangements. Interestingly, some respondents are ready to use Islamic banking products, if credit facilities were available. However credit facilities are against the Sharia principle because they are interest based.

Ahmad and Haron (2002) examine corporate customers in Malaysia to understand whether individuals are aware of Islamic banking products and services. The majority of survey participants are non-Muslims. The results indicate the shortage of marketing of these products. They also find that more than fifty five percent of customers say that they select Islamic banks because of both religious and economic reasons. The economic reasons are cost and profit concerns of these corporate customers.

Abdullah et al (2012) examine the perception of non-Muslim customers towards Islamic Banks in Malaysia. Within survey sample, they find that services and products are well understood by non-Muslims.

These findings suggest that non-Muslims are aware of Islamic banks and their products. People use their products not only because of religious reasons but also economic reasons. It seems that these banks diversify their client portfolio by serving both Muslims and non-Muslims.

3.2 Motivation of Borrowers

Since banks serve the needs of stake holders (depositors, creditors, shareholders and borrowers), the motivation of such parties would matter in order to understand why any of such party prefers (or is obliged to use) Islamic bank over the conventional counterparty. There can be various motives while the prominent one is profit motivation. Similar to Ahmad and Haron (2002), Kader and Leong (2009) show that economic factors are important in the client's choice of Islamic products. They find that in a dual banking system where conventional and Islamic banks coexist, interest rate seems to be important factor for fund users for the bank. That is, in case of high lending rates, borrowers go for Islamic banks whereas they prefer conventional banks in reverse conditions when interest rates decline.

Religious motivation may also trigger stakeholders. In the literature it is documented that religion may affect financial decisions and there is relation between being religious and risk taking. Miller and Hoffmann (1995) state that negative correlation between religion and risk taking can be understood by an analogy that a person has nothing to lose if he has faith of God. That is he expects a reward by believing in God, without taking any risk. Hess (2012) finds that religiosity matters in personal financial decision. Compared to lower level of religiosity based on the metropolitan area residency, he finds that risk aversion with a proxy of less bankruptcy and higher ethical standards with a proxy of higher credit scores follow higher level of religiosity. Jiang et al. (2015) confirm this relationship for family firms in a study conducted in China. They classify religions as Western (such as Christianity, Islam and Judaism) and Eastern (Buddhism, Hinduism, Taoism etc.). This relationship seems to

hold for western religions. Based on US study, Hillary and Hui (2009) take this relationship a step further, and find that higher religiosity is associated with lower level of risk exposure measured with volatility in ROA and ROE. Moreover, they observe that CEOs seem to prefer similar religious firms when they change their jobs and move to another firm. As another evidence from the US, Baxamusa and Jalal (2014) find negative correlation between Protestan religiosity and leverage ratio.

Hasan et al. (2012) show that profit, religion and service quality are criteria for the selection of Islamic banks in Pakistan. Özsoy et al. (2013) find that product and service quality is prominent factor in individual's preference of participation banks in Turkey. The other factors are trust, personnel quality and religious motivations. However it is notable that different business model applied by Islamic banks seems not granting to exert market power (Weill, 2011). That is, Islamic banks do not charge higher prices for their products due to providing Sharia compliant products.

Ongena and Şendeniz-Yüncü (2011) examine factors affecting the bank type choice of firms in Turkey using multinomial logit model. Their loan-firm level data come from Kompass for 2008 with 10,170 complete firm quarterly records. They find that young firms, firms with multiple bank relationships, industry based and transparent firms more likely to engage in Islamic banks. Several questions can be raised based on their findings. For example, do young firms willingly engage in Islamic banks or do not they have any other option? That is, it might be the case that Islamic banks are dealing with firms not accepted by conventional banks due to risk concerns.

CHAPTER 4

EFFICIENCY OF ISLAMIC BANKS

Bank efficiency is measured as relative distance of outputs and inputs compared to best practices. In the literature, three methods are used to measure efficiency of banks. The first one is called Data Envelopment Analysis (DEA henceforth). It is a non-parametric method which optimizes performance of each production unit. The second method is parametric method namely Stochastic Frontier Approach (SFA) which benefits from optimized regression via decision making units. These methods differ in terms of making a functional assumption and power of statistical test. DEA does not make any functional assumptions yet it lacks power. The third method is financial ratios approach (FRA henceforth) (Bader et al., 2008). It uses traditional financial ratios as proxies for profitability, revenue and cost efficiency of banks, such as return on average assets, net interest margin and cost-to-income ratio, respectively.

4.1 Definition and Approaches

The problem in efficiency studies is the definition of input and output. Input, input price and output definitions are important to estimate efficiency. Two approaches are widely used to identify input, input price and output variables. Production approach is widely used to examine efficiency of bank branches. It views intermediaries as producers of service to customers (Ahmad et al., 2010). They indicate that inputs are

costs of labor and material (physical), whereas outputs are services provided to customers and can be represented by number of bank transactions for a time period. Intermediary approach views financial institutions as intermediary between lenders and borrowers. In this approach deposits, labor and material can be considered as input variables. Output variables are loans and investments.

Efficiency measured using DEA is cost efficiency. Isik and Hassan (2002) define cost efficiency as proportional reduction in cost if bank uses right combination of inputs given prices (allocative efficiency) and if bank reduces input usage by being in efficient frontier (technical efficiency). Technical efficiency is further decomposed into pure technical efficiency (reduction in input by not wasting input) and scale efficiency (whether constant returns to scale are reached).

The studies that examine the efficiency of Islamic banks can be classified into two: those that examine banks in different countries and those that examine this issue within a country. In summary, the findings depend on the efficiency measure and the estimation technique used in the analyses. Therefore, the comparative efficiency of Islamic banks is highly contingent upon the methodology used. However, in general, it is found that small Islamic banks are too small in terms of scale and they will benefit economies of scale if they become bigger. Their reaction to global crises differed. It is found that their efficiency declined during the 1998-1999 crisis whereas they improved their efficiency during the 2008-2009 crisis. Finally, Sharia compliance of Islamic banks may explain some of reductions in their output or decline in their efficiency.

4.2 Empirical Findings of Islamic Bank Efficiency

Ahmad et al (2010) analyze efficiency of Islamic banks with DEA over 25 countries during the period 2003-2009. Data come from BankScope and cover 77 Islamic banks, including three participation banks operating in Turkey. They find that mean technical efficiency of Islamic banks is 66%. It means that 34% of inputs are wasted by those banks. It is also shown that during the crisis period of 2008 -2009, the technical efficiency of Islamic banks seems to increase. They find that these banks are small in low income countries and they can achieve more efficiency by increasing their scale. Another finding is that large Islamic banks either have constant returns or decreasing returns to scale indicating that they may be too large.

Yudistira (2004) investigates 18 Islamic banks from different countries between 1997 and 2000 by using Data Envelopment analysis and intermediation approach. He defines three inputs and outputs same as Ahmad et al (2010). He finds that inefficiencies are small during the period analyzed, around 10%; Islamic banks seem to be negatively affected from the 1998-1999 global crisis but not from the challenging periods after that; They suggest merger and acquisitions of small banks because they find increasing returns to scale for small banks. The market power of a bank, defined as deposit share of each bank in the banking sector, is high in Middle East is found insignificant factor in explaining efficiency. He justifies these findings by the recent establishment of Islamic banks in this region.

Bader et al (2007) compare the efficiency of conventional and Islamic banks, by using a different method, namely financial ratio approach. Their sample includes 90 banks, 43 of them are Islamic banks and from 21 countries. They find in general no significant difference between Islamic and conventional banks in terms of their efficiency. However, both types of banks are found to be inefficient in terms of profitability, cost and revenue.

Abdul-Majid et al (2010) compare the efficiency of Islamic and conventional banks during the period 1996-2002. They utilize output distance functions arguing that different accounting standards among countries may distort profit and cost distance functions. They find that output of Islamic banks is 12.7% lower than conventional banks but it is not due to managerial inefficiency. They argue that Sharia-compliance may create a different structure for Islamic banks leading to lower output. For all banks, the average potential output is around 20%, higher than the realized output.

There are several studies that investigate the efficiency of Islamic and conventional banks in a specific region or a single country. Hassan et al. (2009) compare Islamic and conventional banks in the Middle East Region. They find that both type of banks are worse in terms of revenue efficiency than in terms of profit efficiency. Conventional-Islamic banks are not found to be different in terms of efficiency measures.

Mokhtar et al (2006) compare technical and cost efficiency of Islamic banks and conventional banks in Malaysia for the period 1997-2003, using Stochastic Frontier Approach. They find that efficiency of Islamic banks increased during this period yet

these banks are less efficient than conventional banks. They also distinguish Islamic windows of conventional banks. Islamic windows are managed by Sharia principles and as a separate fund. These Islamic windows of conventional banks are found to be less efficient than Islamic banks.

Arslan and Ergec (2010) investigate efficiency of banks in Turkey using DEA analysis. They compare technical efficiency of conventional and participation banks for the period 2006-2009 using the data from Banks Association of Turkey (BAT) and Participation Banks Association of Turkey. They find that efficiency of participation banks improved in 2009 compared to 2006. They argue that this is consistent with expectation, since 2006 is the year when conventional and participation banks have same regulation (Banking law no. 5411). Special Finance Houses have turned into participation banks by this law. They also show that participation banks are better than conventional counterparts in terms of efficiency during their sample period.

CHAPTER 5

RISKS IN LOANS ISSUED BY ISLAMIC VERSUS CONVENTIONAL BANKS

The structure or use of Islamic principles or different products raises the question of whether risks inherent in the business model of Islamic banks are different from those of conventional banks. Credit risk, market risk, operational risk and liquidity (especially deposit withdrawal risk for Islamic banks) risk should be taken into consideration in order to understand the premises and challenges of Islamic banks.

5.1 Risks in General

Čihák and Hesse (2010) delve into the question of whether the stability of Islamic banks differs. They utilize z-scores and various control variables in a panel setting. Their sample period is between 1993 and 2004. They examine 77 Islamic and 397 conventional banks with 520 and 3248 observations respectively. Bank level control variables are asset size of banks, cost-income ratio, loans over assets. Income structure of banks is controlled via income diversity from traditional lending activities. On the country level, GDP growth rate, inflation rate and exchange rate are used as control variables. Herfindahl index is also included in the model to account for market concentration. The governance effect is measured with an index covering political stability, government effectiveness, quality of regulations, rule of law and corruption

level. They drop outliers of z-scores 1st and 99th percentiles in their analysis. They find no significant difference between Islamic and conventional banks in terms of their z-scores. When they examine small and large banks separately, they observe that large Islamic banks are less stable but small Islamic banks are more stable than their conventional counterparts.

Abedifar et al (2013) investigate whether credit and insolvency risks change by the types of banks (Islamic, Islamic window, Conventional), and whether Islamic banks extract rents from customers by offering Islamic products and services. The period is between 1999 and 2009 and banks are from 24 countries that are members of the Organization of Islamic Cooperation. First, they estimate models of credit risk, insolvency risk, and bank interest rate by using proxies loan loss reserves to gross loans, Z-score and net interest margin for interest extraction, respectively. They use several control variables, including ownership structure, bank age, macro-economic indicators, and year and country dummy variables. Overall they find that small Islamic more leveraged (lower capital to asset ratio) banks and the banks in countries with high rate of Muslim population have lower credit risk than credit risk of conventional banks. Arguably they claim that risk aversion of religious people leads to lower credit risk. Small Islamic banks are also superior in terms of insolvency risk. There is little (not-robust) evidence that Islamic banks charges higher interest for loans and lower interest rates for deposits in providing Islamic instruments and services. Conventional banks seem to be more prone to domestic interest rate risk in terms of loan quality compared to Islamic banks.

Kader and Leong (2009) investigate how the demand for Islamic financing changes with the change in interest rate in Malaysia where both Islamic and conventional banks operate. They hypothesize that when lending rate increases borrowers would go to Islamic banks because of profit motivation, the reverse happens in case of decline in interest rates. They use time series analysis techniques such as VAR, Granger causality and Impulse response function. They examine total residential property loans issued by conventional banks and of Islamic banks and base lending rate. The findings are consistent with their hypothesis. They suggest that interest-free Islamic banks are exposed to interest rate risk.

Ergeç and Arslan (2013) hypothesize that Islamic banks are insensitive to changes in interest rates. They use interbank overnight interest rates, consumer price index, industrial production index, total loans and deposits of conventional and participation banks and real exchange rate. All variables are found to be integrated of order one. Impulse response functions show that an increase in interest rate negatively affects deposits of Islamic banks while positively affects loans of Islamic banks. Overall, they find that various interest rates affect Islamic banks instruments' rates in Turkey with vector error correction model.

5.2 Credit Risk

Credit risk is associated with not fulfilling the requirements of debt contracts by either delaying principal and/or interest payment or by not meeting the certain promised covenants. It is also called default risk or sovereign risk. They are related with the ability of governments or issuers to fulfill their debt obligations.

Credit risk arises from moral hazard problem. Due to the information asymmetry, fund provider may not be able to control fund user throughout the project. In case of divergence from project in a risky manner, it may lead to default or worsening of financial situation. Banks as financial intermediaries are to manage such moral hazard issues.

Islamic and conventional banks offer different products and probably to different pool of customers. There might be some differences in their risk dynamics. Song and Oosthuizen (2014) point out this issue. Islamic banks might have higher credit risk, since interest rate can not be charged for a default of borrower other than deliberate intent. Moreover, limited customer base and concentration should also be considered. However, Islamic banks might face with lower credit risk because banks may transfer part of their credit risk to depositors with profit and loss sharing contracts (How et al., 2005). Moreover, religion may be prevalent in the sense that only highly religious people who are assumingly less prone to default work with Islamic banks (Abedifar et al., 2013). Therefore, it is not clear whether Islamic banks hold more or less credit risk compared to conventional banks.

In empirical studies, three variables are extensively used to compare credit risk of banks: (1)Non performing loans ratio (NPL) as a measure of ex-post credit risk, (2) Z-scores, calculated using accounting ratios, (3) Distance to default method, a market based method, measured with the number of standard deviations for market value of assets of banks to reach the level of default which is equal to book value of liability (Kabir et al., 2015)

In a study conducted in Pakistan between 2002 and 2010, Zaheer et al. (2013) consistent with Baele et al. (2014) find that indicators like NPLs and loan loss provisions to gross loans ratios for Islamic banking institutions are lower compared to the ratios of conventional banks. They use z-score for insolvency risk. For the asset quality, non-performing loans over gross loans and provisioning to gross loans are used. They find the asset quality of Islamic banks is better compared to those of conventional banks.

Saeed and Izzeldin (2014) show that there is a connection between efficiency and risk. They use stochastic frontier approach and Merton's distance to default model to measure efficiency and risk, respectively. They apply panel vector autoregressive model to understand the relationship between efficiency and risk. They have unbalanced panel of 106 publicly listed banks from eight countries for the period 2002 - 2010. Turkey is not included in their sample. They control for country effects with variables such as market concentration (assets of three largest banks), loan intermediation (Total Loans /Total deposits), GDP per capita and population density. They state five hypotheses that may explain efficiency and stability relationship. The first hypothesis is bad luck hypothesis. They argue that since Islamic banks can not charge penalties in case of defaults, the riskier borrowers may prefer Islamic banks. This leads to increase in cost inefficiency due to the fact that more monitoring is required. The second hypothesis which is called as moral hazard is about higher risk-higher inefficiency paradigm. Managers may follow an expansionary stage and take more risks. The third hypothesis is skimping hypothesis. Managers may hinder their risks by increasing asset size or restructuring non-performing loans. Since PLS products

in Islamic banks share losses, bank managers may abuse this by increasing loan amount excessively. In case of high inefficiency-low default risk framework, the fourth hypothesis namely risk averse management might be relevant. Risk averse managers may want to be on safe side by reducing risky investments (probably more profitable investments at the same time) and increasing monitoring costs. Finally bad management hypothesis claims that incompetent managers fail to control the risks and also fail to increase efficiency. They find that distance to default reduces (i.e. risk increase) when cost efficiency increases. This finding may imply that risk management is sacrificed for cost efficiency. The other finding is that profit efficiency is positively associated with higher financial instability (higher risk of default) except for Islamic banks. Islamic banks have this relationship at weaker level. Islamic banks can improve their profit efficiency while holding their default risk at a stable level. Saeed and Izzeldin (2014) discuss that this exception may occur due to investment accounts special to Islamic banks which are related to Profit Loss Sharing paradigm.

Kabir et al. (2015) consistent with Baele et al. (2014) use different credit risk proxies (especially favoring Merton's distance-to-default (DD) model, NPL ratio, z-score) to evaluate credit risks of conventional and Islamic banks operating in 13 countries for the period between 2000 and 2012. They find that DD model implies lower credit risk for Islamic banks, while other accounting measures propose the opposite relationship. In their model, they control for asset size, asset growth, cost-to-income ratio and other bank specific characteristics, in addition to country control variables, such as GDP, inflation and concentration.

Beck et al. (2013) find that asset quality, capital ratio, asset intermediation is higher for Islamic banks. They also find that conventional banks are more cost effective. They measure quality by using loss provisions, loss reserves and non-performing loans over gross loans as credit risk indicators for the period of 1995-2009 including 510 banks across 22 countries. They also look at business orientation. They use loan to deposit ratio, fee-based income over total income and non-deposit funding to total funding as proxies for business orientation. Cost-income ratio and overhead cost are two indicators used to measure bank efficiency. For the bank stability, liquidity ratio, z-score, capital to asset ratio are adopted.

Glennon and Nigro (2005) investigate credit risk of small business loans with the framework of discrete time hazard model for a period of 1983-1998. Although they did not compare Islamic banks with conventional banks, they examine size of borrower. They use borrower, lender and loan characteristics in the model. Lender characteristics include but not limited to loan originator and less information is required. Among borrower characteristics, there are firm size (number of employees), firm status (new-old) and industrial classification. Loan attributes are such as type of interest rate, approval amount, whether sold in secondary market. Moreover, they also include time specific and macro-economic conditions. They find that time dependency of default is distinct. New businesses, large firms and firms with higher guarantee percentages are found to be more risky in terms hazard rates.

Baele et al. (2014) compare default rates of Islamic and conventional loans taken by firms. They assume that more religious people will take loans from Islamic banks. Based on the hypothesis that religious customers would be loyal to their debts,

default rates are expected to be lower in Islamic loans. The other hypothesis is that the moral motivation would affect pious customer to default on conventional loan before Islamic loan. Finally, the third hypothesis is the higher the piousness or connectedness (network effect) is the lower the default rate. In an analysis conducted in Pakistan during 2006-2008, it is found that default is less likely for Islamic loans, so the result is consistent with the abovementioned hypotheses. Moreover, during Ramadan and where religious party voters are majority, defaults are found to be less likely. Their findings are robust to the technique used in the analysis, including logit, Weibull hazard model and Cox proportional hazard model. They control for loan characteristics, such as collateral, purpose of financing (agriculture, export etc.) and maturity; borrower characteristics, size of borrowers, regions, whether borrowers use both conventional and Islamic banks, bank types (state, foreign etc.) and city features such as population, share of conservative party votes. In this thesis, I test their hypotheses for the conventional and participation (Islamic) banks operating in Turkey.

In summary, the comparison of Islamic and conventional banks in terms of credit risk in different analyses with different measures shows that there is no direct answer whether one type of bank is more risky in terms of credit risk. Firm size, proxy selection for credit risk such as NPL ratio, distance-to-default, loan loss provisions ratio and probability of default of individual loans demonstrates different results in terms of comparative credit risk. Further analyses at micro level enhance the insight of dynamics of credit risk of Islamic and conventional banks.

CHAPTER 6

BANKS AND BANKING REGULATION IN TURKEY

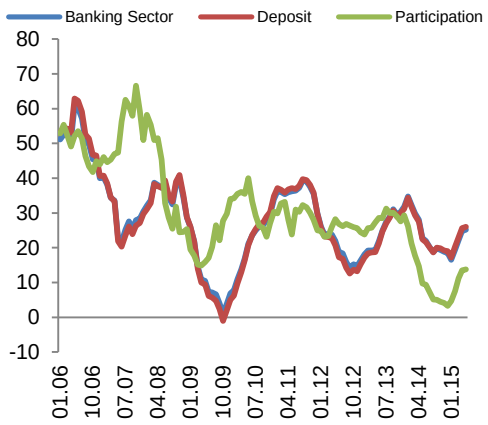
6.1 Banks in Turkey

The Turkish financial system is dominated by banks. According to Banks in Turkey 2014 report (2015), total asset share of banks over total financial assets is around 86% as of December 2013. As of May 2015, there are 50 banks operating in the Turkish banking system: four private participation banks, three state deposit banks, 13 investment and development banks and 30 deposit banks. Recently, a state participation bank was established. Participation banks operate under Islamic principles as Islamic banks.

Several characteristics of Turkish banking sector and participation banks are reported in Table 1. The asset share of participation banks hovers around 5%. The intermediation level of Islamic banks is close to the level of conventional banks for the sample period of 2011-2012 in terms of loans to total deposits ratio. Sharia compliance limits the amount of government assets invested by participation banks. Because of the issuance of sukuk by the government, the share of government securities in the portfolio of Islamic banks increased over the last two years.

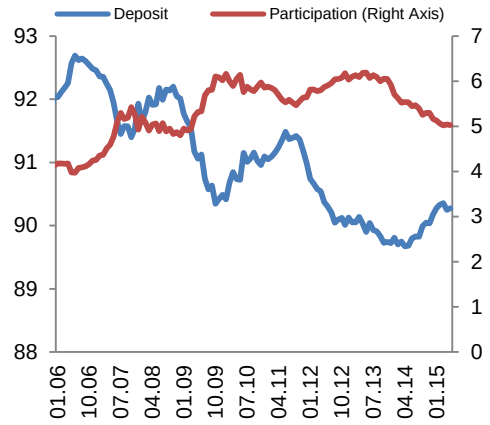
Figure 2 presents the annual loan growth rate of deposit, participation banks and banking sector for the period 2006-2015. The annual average loan growth rate of banking sector has declined from 51.4% in 2006 to 21.7% in 2015 because of macro prudential measures taken by CBRT and BRSA. Loan to value regulations, caps on loans and credit cards, reserve option mechanism, and extending reserve requirements to finance companies are some of the macro prudential measures taken. Except for the last two years, participation banks were able to grow even during crisis period. Figure 3 shows the loan share of participation and deposit banks for the period 2006-2015. The loan share of participation banks has increased from 4.2% in 2006 to 5.1% in 2015.

Figure.2: Annual Loan Growth (%)



Source: BRSA Statistics

Figure.3: Loan Share (%)



Source: BRSA Statistics

According to Table 2, profitability of conventional banks became more prominent over the years compared to participation banks. Interest revenues scaled by total assets may signal that Islamic banks do not charge extra rents from the customers, which is consistent with the findings of Abedifar et al. (2013). This is especially true for the recent periods. Moreover, participation banks seem to improve their operational efficiency by reducing their operational expense to total assets ratio but their ratio is still higher than that of conventional banks.

In terms of liquidity risk and withdrawal risk, there are differences between participation and deposit banks. As Figure 4 demonstrates, term deposits-to-total deposits ratio indicates higher volatility for participation banks. Moreover, demand deposits have higher share in the context of participation banks implying higher withdrawal risk. While almost half of deposits of conventional banks are from high volume deposits, only one third of deposit amount is over TRY 1 million in case of participation banks (Figure 5). These banks hold more liquid assets as shown in Figure 6, possibly for two reasons. Inadequacy of derivative instruments and regulations specific to Islamic banks may limit their hedging activities. Moreover, demand deposits which can be withdrawn on demand are relatively high in Islamic banks. Foreign exchange risk is also important to consider. Banking regulation imposes limits on the ratio of regulatory capital. As Figure 7 indicates, both type of banks covers FX net positions cautiously.

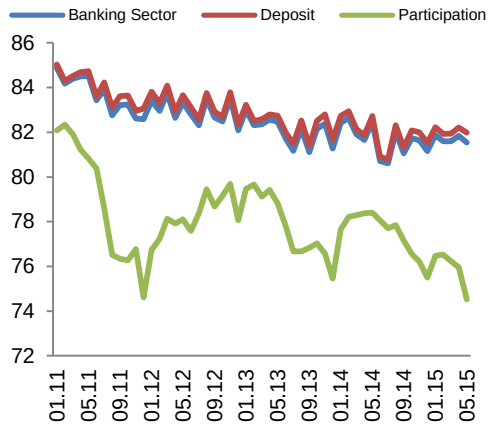
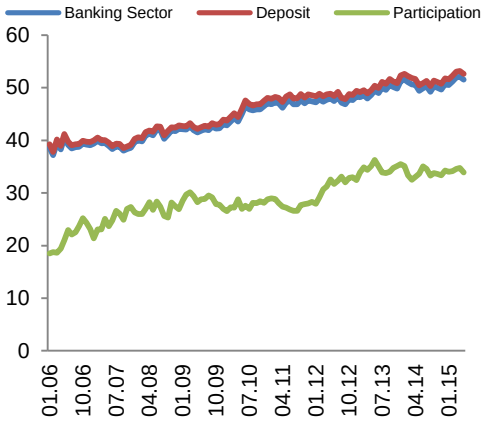
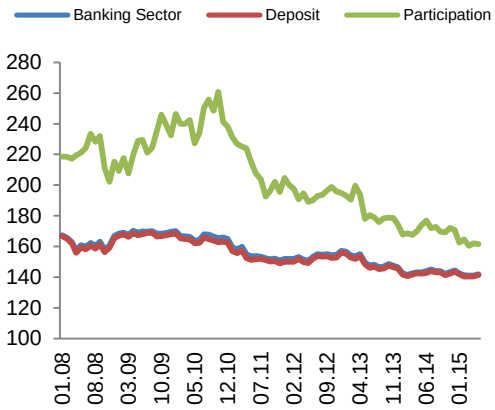
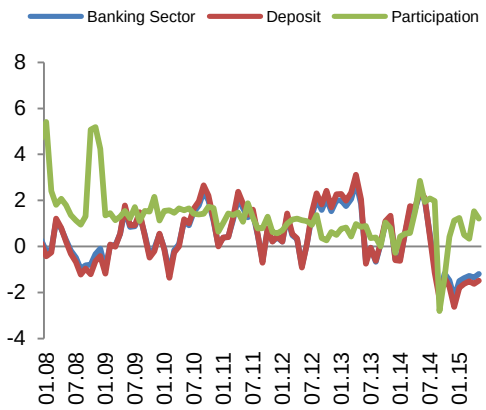
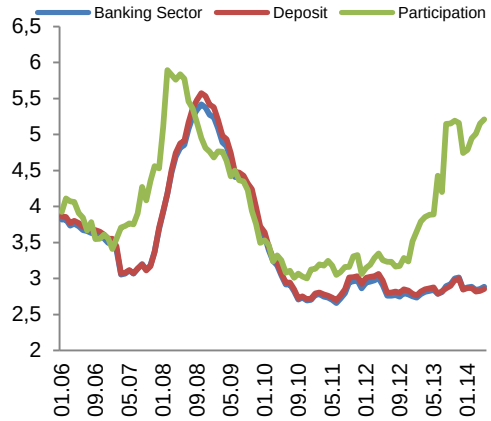
Figure.4:Term Deposits/ Total Deposits	**Figure.5: High volume deposits/Total deposits**
	
Source: BRSA Statistics	Source: BRSA Statistics

Figure.6: Liquidity Requirement Ratio (%)	**Figure.7: Net FX Position/Regulatory Capital (%)**
	
Source: BRSA Statistics	Source: BRSA Statistics

One of the credit risk indicators is non-performing loans to gross loans ratio. Non-performing loans are the loans which are overdue 90 days. Figure 8 indicates that participation bank loans are in general more prone to default. There can be various reasons for the higher NPL ratios of participation banks, such as composition of loans and moral hazard hypothesis. If the loan portfolio is composed of more risky assets such as loans to SMEs, R&D firms etc., then the risk of default increases, holding all else constant.

Figure. 8: NPL ratios of Participation and Deposit Banks

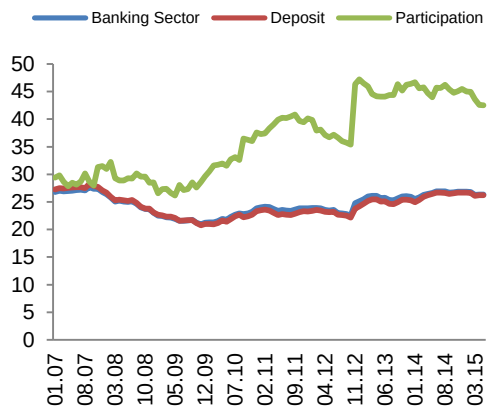


Source: BRSA Statistics

SME loans are important in the sense of diversification benefits. Shaban et al. (2014) show that small banks are more enthusiastic about lending to SMEs compared to large banks. The moral hazard hypothesis, proposed by Berger and DeYoung (1997) seems to be valid for Islamic banks. They hypothesize that if the bank is undercapitalized, it is more likely to invest in riskier businesses. Shaban et al. (2014)

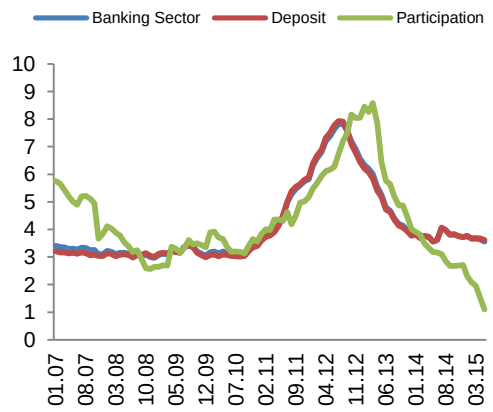
find that in Indonesia, Islamic banks are less capitalized compared to conventional banks. It is observed in Turkey as well. The relative undercapitalization of participation banks in Turkey can be seen at Figure 12. Small firms are more likely to get their loans from participation banks than conventional banks (Ongena and Şendeniz-Yüncü, 2011). The increase in the share of SME loans in the participation banks since 2006 supports these explanations.

Figure.9: SME Loans /Total Loans (%)



Source: BRSA Statistics

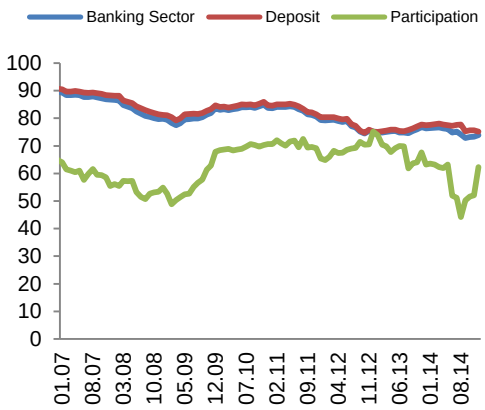
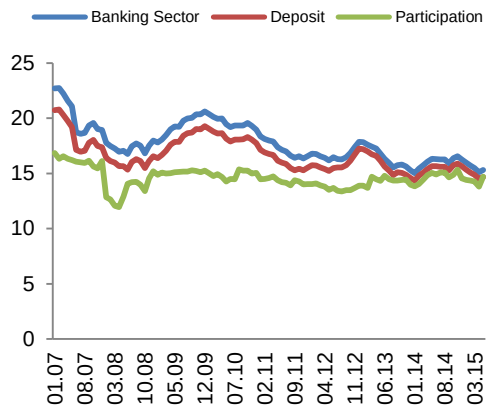
Figure.10: SME NPL/Total SME Loans (%)



Source: BRSA Statistics

Loan loss provisions are the amount allotted as expense for non-performing loans. Farook et al. (2014) investigate the connection between loan loss provisioning and profit distribution management for Islamic banks. They find that loan loss provisions are consistently low and there seems an evidence for such connection. It seems that participation banks use loan loss provisions to manage profit distribution since there are investment account holders in addition to shareholders. The observations

for Turkey is also parallel with the findings of Farook et al. (2014). Moreover, it is notable that the capital adequacy ratios of both types of banks are well above both minimum ratio (8%) and target ratio (%12).

Figure.11: Loan Loss Provisions/Gross Non-Performing Loans (%)	**Figure.12: Capital Adequacy Ratio (%)**
	
Source: BRSA Statistics	Source: BRSA Statistics

6.2 Banking Regulation in Turkey

Banking Law No: 5411, enacted in 2005, regulates banks, financial holdings, banking regulation and supervision agency (BRSA), banks associations and savings deposit insurance fund. According to this law, special finance houses are turned into participation banks. Participation banks can not accept deposits, while conventional banks can not accept participation funds and make financial leasing services.

The regulation on credit operations of banks which was published in the Official Gazette Nr. 26333 dated November 01, 2006, defines six financing instruments that participation banks can use instead of time deposits or interest bearing loans. The first two methods are corporate and individual financing supports. With these supports, participation banks purchase the product on behalf of customer, and sell it to the customer with a mark-up cost. The third method is profit and loss sharing investment. The project profit is shared between the two parties with the terms of the contract. However, the profit is not guaranteed and no clause that guarantees profit is specified in the contract. As the fourth instrument, financial leasing is used to lease machinery, equipment or other fixed items. The financing commodity against document is the fifth method to finance fund users. Finally, participation banks can provide capital as a partner in the sixth method of "joint investments" with some limitations. Some of the limitations are a maximum of seven years of investment and 15% cap on investment share in terms of own funds of bank.

The regulation numbered 26333 also specifies the procedures and principles in determining the qualifications of loans and other receivables and the provisions to be set aside by banks. According to this regulation, banks are required to classify their loans and other receivables into five categories according to their default risk. The first level (the least risky) is for regular loans which are expected to be paid at maturity. The second group is the loans whose borrowers are capable to repay back for now but there is a downward trend for their capacity to pay. These loans require close monitoring. The third group is for loans which are overdue by 90 days but less than 180 days. The fourth group of loans is the ones not paid back after 180 days of the maturity but not

more than 1 year. The loans in Group 5 are considered as “having the nature of loss”. Therefore, the loans in this group are not paid back even one year after their maturity. The loans in groups 3, 4 and 5 compose of non-performing loans.

CHAPTER 7

HYPOTHESES, DATA AND METHODOLOGY

7.1 Hypotheses

The motivations for the preference of Islamic loans raise the question of whether similar type of loans given by conventional and Islamic banks show similar characteristics in terms of default. Regarding Baele et al.(2014), the choice of taking credit from a certain type of bank can be tested via its default characteristics. Religious motivation for similar types of loans is considered to be important. Therefore, in a world where there are pious and secular borrowers and where there is two type of banks (conventional versus Islamic), we have a probability of selection of a bank and probability of acceptance. That is, a person with a desire of taking a loan has a certain level of piousness. This person either goes for conventional bank or Islamic bank (There is no Islamic window of conventional bank in the context of Turkey). Then, there is probability of acceptance of such loan request. Finally, the received loan either matures or defaults.

Like Baele et al. (2014), I will test three hypotheses for a sample of firm loans in Turkey. The first hypothesis implies that participation loans are less prone to default. The second hypothesis is that dual borrower, who borrows from conventional and participation bank, is more loyal to participation loan. That is, in case of borrowing

from two types of banks, participation loans are less likely default. The third hypothesis tests the higher the piousness is, holding all else constant, lower the probability of default. Unlike Baele et al. (2014) I would expect to see different results when I test the hypotheses in Turkey. The reason is that Turkish government aims to increase market share of participation banks. This aim may make participation banks to be more aggressive in granting loans. Moreover, the assumption that participation banks lend more proportionately to religious borrowers is a strict assumption. This assumption may not hold since several studies indicate that non-Muslims are getting these products because of their economic motivation.

7.2 Methodology – Survival Analysis

I test these three hypotheses of Baele et al. (2014) by comparing default probability of firm loans granted by participation and conventional banks using survival analysis.

Loan default has two outcomes: default (failure) or non-default (censoring due to out of sample period non-observation or paid back). Such failure analysis can be implemented via survival (duration) analysis methodology. Jenkins (2005) describes the survival analysis as moving along probabilistic states, a certain number of observations fail to move (do not go next state). Such failure to move may be because of having spell (default, die, or any other transition to event) or because of exiting from study for other reason (censoring or truncation).

Survival, failure and hazard functions are among important concepts in survival analysis. Survival function can be considered as the probability of surviving up to a certain period while failure function is the cumulative probability of failing up to a certain period (Ibrahim, 2005). Let "t" indicates a certain period and "spell" is transition of event then, hazard function simply is "the conditional probability of having a spell length of exactly t, conditional on survival up to time t" (Jenkins, 2005). Failure, survival and hazard function can be shown as follows (Jenkins, 2005).

$$Failure\ Function: Pr(T \leq t) = F(t)$$

$$Survival\ Function: Pr(T > t) = 1 - F(t) \equiv S(t)$$

$$Hazard\ rate: \frac{f(t)}{S(t)}$$

where T: continuous random variable

t: duration (elapsed time)

f(t)= probability density function of T

F(T)=cumulative distribution function of T

The survival analysis is used extensively in medical studies. However, any type of event transition over time can be modeled in this context. Loan or bank defaults are examples of its use in finance. One important problem with the survival observations is that limited sample period does not allow observing every transition of observation (loans, banks or patients). Therefore, one does not know what happened to the observation before or after the sample period. This limitation is called censoring. Right

censoring occurs when the information about the survival time is not known at the end of sample period, while left censoring is not knowing the observation up to analysis period such as loan of previously defaulted borrower. Another problem with survival data is truncation which is related to sample selection (Cook, 2008). As an example to left truncation, sample of previously defaulted borrower without knowing the default date precisely can be selected for analysis. One might argue that such censored observations can be excluded. However, those observations may have some characteristics (valuable information for population), so they should be included in the sample.

Although it is possible to restrict survival function with an assumed distribution to estimate hazard ratio, more direct analysis might be to impose a restriction on functional form of hazard ratio itself (Greene, 2003). Hazard model consists of two type of covariates. The first type of covariate is baseline hazard –duration dependence- (time dependent hazard). It shows the effect of passage of survival time on hazard rate. The other type of covariate includes time varying (age, duration etc.) or fixed (maturity, birth of place etc.) variables. Based on duration dependence assumption whether hazard increases, decreases or stays same over time, different types of distributions are possible. While fixed effects of certain characteristic can be used to control for time invariant unobserved heterogeneity, it is not possible to find every characteristic such as skill. In order to control for such effects, shared frailty with an assumption on distribution can be used.

There are two different ways to interpret hazard ratios. Proportional hazard model (PH) demonstrates that for a particular period, independent variables proportionally differ in terms of hazard ratio. Accelerated failure time (AFT) implies that given the hazard ratio how time changes for a particular independent variable (Jenkins, 2005). For example, if survival of twins where one has the disease and the other has not is compared, it can be seen that relative time of reaching death would be faster for the diseased person. Jenkins (2005) mentions that Weibull distribution is appropriate in both AFT and PH with the advantage of flexible duration dependence.

In summary three factors, which are censoring, time varying covariates and structural modeling, characterize survival data and imply that OLS model is inappropriate while logit/probit (binary models) requires modification (Jenkins, 2005). He argues that OLS is deficient in case of survival analysis, since censored observations are considered as if they are complete. Another problem is that OLS treats observations as independent, while observations experience effects as time goes by as in time series. For example, a loan characteristic such as current value or remaining maturity may change over time which is called as time varying covariate. Binary models are also inadequate for time varying covariates without modification. In discrete analysis, logit model with time dummies or other baseline hazard specifications takes passage of time into account. Hence time dummies or other baseline hazard specifications are required as modification to use binary models. The estimated coefficients in logit models can be transformed into odds ratios to interpret economic significance.

Among various methods for survival analysis, I use continuous parametric (Weibull) model consistent with Baele et al. (2014). As a robustness check, I compare results with discrete complementary log-log regression while accounting for duration dependence. I do not use cox proportional hazard model, since it is computationally burdensome given the size of sample for this thesis. I use Stata program for the analyses and benefit from Stata Survival Analysis And Epidemiological Tables Reference Manual Release 13 (2013). I use survival analysis techniques because average loan amount weighted maturity of loans in my sample is around 1.5 year. The maturity of 47% of loan-month observations exceeds the end of sample period (right censored). There exists serious right censoring problem. Therefore right censoring should be carefully taken into account in this analysis by using survival analysis techniques.

The general continuous model which includes both time varying covariates (note subscript "t") and shared frailty (unobserved heterogeneity in survival analysis) for proportional hazard is shown below consistent with Jenkins (2005).

$$\theta(t, X_t | \vartheta) = \vartheta * \theta_0(t) * \exp(\beta' X_t) = \vartheta * \theta_0(t) * \lambda \quad \textbf{(1)}$$

Where $\theta_0(t)$ = Baseline hazard which depends on time (t)

X_t= Loan specific time independent variables and time varying covariates

ϑ = Shared frailty term

λ= Proportional hazard term

For three hypotheses, I use following continuous model specifications.

Hypothesis 1: Null. Participation loan is equally likely to default compared to conventional loan.

$$Continuous: \theta(t, X_t) = \alpha * \exp\begin{pmatrix} \beta_k * LoanChar_{kt} + \\ \beta_m * BorrChar_{mt} + \\ \beta_h * BankChar_{ht} + \\ YearMonth_l + \\ Financing_p + \\ City_u \end{pmatrix}$$

Hypothesis 2: Null. Participation loan is equally likely to default compared to conventional loan for the same borrower.

$$Continuous: \theta(t, X_t) = \alpha * \exp\begin{pmatrix} \beta_k * LoanChar_{kt} + \\ \beta_m * BorrChar_{mt} + \\ \beta_h * BankChar_{ht} + \\ YearMonth_l + \\ Financing_p + \\ City_u \end{pmatrix}$$

Hypothesis 3: Null. Participation loan is equally likely to default compared to conventional loan as piousness changes.

$$Continuous: \theta(t, X_t) = \alpha * \exp\begin{pmatrix} \beta_k * LoanChar_{kt} + \\ \beta_m * BorrChar_{mt} + \\ \beta_h * BankChar_{ht} + \\ \beta_n * CityPeriodChar_{nt} + \\ YearMonth_l + \\ Financing_p + \\ City_u \end{pmatrix}$$

The dependent variable is hazard rate in continuous model. In the baseline continuous model, loans that are overdue at least 90 days are considered as failure. "α" is duration dependence (baseline hazard dependent on time) term which shows the effect of survival time on hazard rate.

"LoanChar" denotes loan characteristics. It includes the type of loan such that if it is participation loan then part_loan takes value of one. There are also other characteristics namely maturity, and whether loan is collateralized (collateral), the natural logarithm of loan amount (lnloan_amount), the interest rate or mark-up rate of loans for conventional and participation banks, respectively (intrate).

"BorrChar" represents the characteristics of the borrowing firm. They include its size (lnsize), a dummy variable indicating whether a firm takes one or more loans during the sample period (diff), a dummy variable indicating whether a borrower gets a loan from more than one bank (multiplebank), and other dummy variables indicating whether borrower get its first loan from a conventional bank or from a participation bank (consenior and parsenior respectively). There are also dummies if a borrower borrows only from participation bank (borr_participation), if a borrower borrows only from conventional bank (borr_convent) and if a borrower borrows from conventional and participation bank (twotype). Large firm dummy (large_firm) indicates one if sum of all loans granted is greater than those of other firms at 75^{th} percentile. Small firm dummy indicates one if sum of all loans granted is less than those of other firms at 25^{th} percentile. The definition and descriptive statistics of the variables are reported in Table 6.

"BankChar" represents bank characteristics controlled in the model. They are dummy variables indicating the type of a bank: state bank, participation bank, investment bank, large bank, foreign bank. The foreign participation banks are not included in foreign bank definition. Large bank is a dummy variable which takes value of one if the bank asset size in a period greater than the asset sizes of other banks at 75^{th} percentile. The definition and descriptive statistics of the variables are reported in Table 6.

"CityPeriodChar" indicates control variables such as an indication for Ramadan month (ramadan), density of mosques in a city (more_mosque and less_mosque), population of city (bigcity) and Al-Quran course participants per population (more_coursier, less coursier) in a city. The latter three control variables are proxies for piousness or network effect. These control variables are dummy variables taking value of 1 if city has more mosques per population, more population or more course participants per population than other cities at 75^{th} percentile or less than at 25^{th} percentile respectively.

The fixed effects of city (city), time (year-month), use of loan such as agriculture, mining and construction etc. (Financing) are controlled as well.

In the baseline model, I employ loan, borrower and bank characteristics, year-month, financing and city fixed effects. The models are applied at different samples. They are run separately for large and small firms since participation banks give loans to small firms. I also estimate these models for banks with similar size by excluding

large banks to have comparable bank sizes. In order to test the second hypothesis, dual borrowers are used in the analysis.

7.3 Data

The loan and bank data are obtained from Central Bank of Republic of Turkey (CBRT). The population data in 2011 is from Turkish Statistical Institute (TÜİK). Mosque numbers and course attendees of Al-Quran courses for the city data as of December 2014 are obtained from Presidency of Religious Affairs of Republic of Turkey. The monthly loan data covers business loans between the January 2011 and December 2012.

In the analysis, only loans that are originated within the sample period are used. Ten digit tax id information is used to exclude non-business loans. The analysis solely focuses on TRY loans. Therefore, FX loans and FX indexed loans are also excluded. Moreover based on the financing codes, the loans that are particularly related to governmental activities and loans granted to international institutions are excluded as shown in Table 3. Final dataset concludes with more than 4 million loans with more than 18.5 million loan-month observations given by 4 participation and 40 conventional banks (private, foreign, investment and state banks) to 335,088 borrowers. Since loan id information was missing in the dataset, so the identification of loans is required. It is assumed that the loan would be considered same over the period if it is granted by same bank branch, at same original maturity and beginning date, with same financing code to an exact id (according to tax identity code). The limitation is that there may be more than one loan in the same period with same characteristics. In order to account for this,

another assumption was imposed. In this assumption throughout the period, the duplicate loan month observations are grouped together based on the loan amount. In order to adjust possible misreporting errors, extreme values (such as 1000% interest rate) are winsorized at 99^{th} percentile.

Default variable is defined in two ways. First, the loan is called default if it is 90 days overdue (def_loan). Second, the loan is called default if it is overdue 180 days (def_loan2). As shown in Table 4, total of 2.8% loans defaulted under the first definition of default. The sector default ratio is 1.9% in case of 180 days overdue. Default ratio of participation loans are higher compared to conventional loans. Only small number of loans is the single loan outstanding for a borrower, especially for a borrower borrowing from participation bank. That is; there is more than one loan for a borrower in general. Participation loans have shorter maturity and lower interest rate. These banks give more favorable loan degree to the borrowers compared to conventional banks. Most of the participation loans are collateralized, while the amount of collateral on these loans is lower than conventional loans. It is notable that majority of participation loans belong to borrowers borrowing from both types of banks. Regarding to industries, loans for construction, manufacturing and wholesale trade have important share in the loan portfolio of both participation and conventional banks.

Participation loans taken by large firms have high share in the loan composition of participation banks. We should be careful in the interpretation of firm size proxy because size is measured by total value of loans granted to a borrower, during the sample period. This measure may create a problem if the value of loans issued before the sample period are significant or the firm has low debt ratio. It seems that loans are

largely taken in the big cities and the shares are quite close for participation and conventional banks. Participation banks are of middle sized in terms of TRY total asset size. 35% of Islamic loans and 37% of conventional loans are right censored. This is important to notice, since right censoring should be treated in the duration analysis.

When borrowers are analyzed, table 5 indicates that about 9% of borrowers failed to fulfill payments by more than 90 days. The default rate is about 6.3% in case of 180 days. In terms of borrower composition of banks, only one third of participation bank borrowers take loans solely from this type of banks. Majority of their borrowers utilizes both types of banks. These borrowers borrowing from both conventional and participation banks enable us to test the second hypothesis. The variable, ldegree, indicates the highest risk in loan portfolio within a certain bank type for a borrower borrowing from conventional and participation bank. If loan degree issued by participation bank is higher, it may loosely imply that participation bank sees this borrower less risky. However it might be purely related to riskiness level of loan. The average loan degree for the loan portfolio whose borrowers borrow from both types of banks is 1.119 for conventional banks and 1.115 for participation banks. The more direct link to perception of bank about borrower can be established by bdegree variable. Banks give internal ratings to borrowers for their financial situations from one (least risky) to five (riskiest). If the same borrower gets different degrees from different types of banks, then this might indicate risk aversion of those types of banks. However it is still possible that such difference may be related to time dimension. Among the borrowers borrowing from both types of banks, participation bank sees 8.2% of borrowers as less risky. Again almost two third of borrowers who borrow from both

bank types, first take a loan from conventional bank then from participation bank. Reverse happens with around 35% of such borrowers. Finally, 33% of total borrowers borrow from more than one bank.

Table 6 reports the loan-month observations of various characteristics including default, borrower, loan, bank, city, and time characteristics. Mean difference of participation and conventional observations are statistically significant (Welch t-test) at statistical significance level of 0.001. Without control of other characteristics and duration dependence, the default rates of participation loans are lower than the default rate of conventional loans. The share of loans overdue 90 (180) days is 0.59% (0.43%) for participation banks and 0.73% (0.46%) for conventional banks over the time period analyzed in this study. The majority of participation bank borrowers (81.6%) also borrowed from conventional banks whereas only 22% of conventional bank borrowers get loans from participation banks. The share of loans provided to large and medium sized firms is high in the participation banks. Loan degree of participation loans are slightly favorable on average 10% of loans are issued during Ramadan.

Figure.13: Sample NPL Ratios of Firm Loans of Conventional and Participation Banks(%)

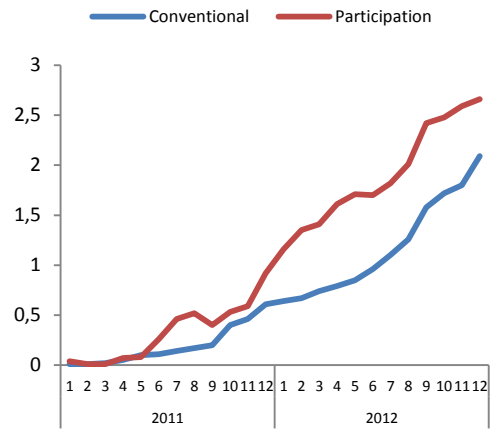


Figure reports NPL ratios (90 days overdue) of conventional and participation loans during the sample period

Figure.14: Sample Collateral Ratios of Firm Loans of Conventional and Participation Banks(%)

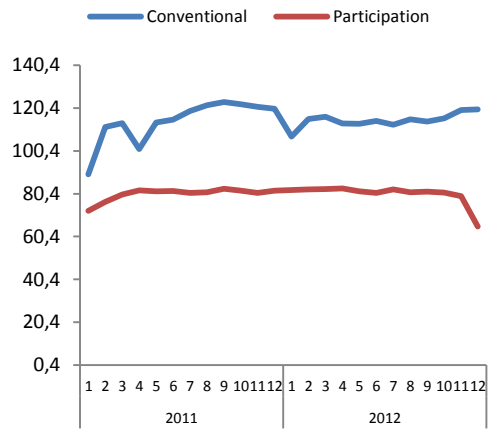


Figure reports collateral amount divided by loan amount of conventional and participation loans during the sample period

Figure.15: Sample Weighted Maturity of Firm Loans of Participation and Conventional Banks

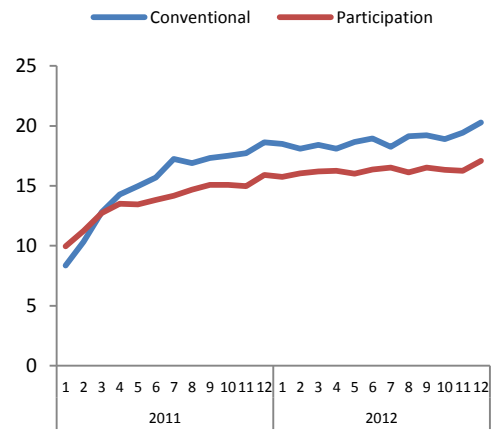


Figure reports weighted maturity of participation and conventional loans during the sample period

The sample data show that the average NPL ratio is 1.4% in the sample period. Loan amount weighted maturity is around 1.5 year, while collateral amount is above loan amount (112%). As presented in Figures 13, 14 and 15, loans issued by conventional banks have higher quality (1.3% versus 2%), longer maturity (1.5 year versus 1.3 year) and higher collateral ratio (115% versus 80%) than those issued by participation banks.

CHAPTER 8

EMPIRICAL FINDINGS

8.1 Main Findings

The first null hypothesis that participation and conventional loans are equally likely to default is rejected as reported in Table 7, when borrower, loan and bank characteristics are controlled in the model. Table 7 reports the results of duration models with Weibull distribution as a baseline hazard function for the whole sample. Dependent variable is hazard rate in the models. Although the first model in Table 7, which does not take any control variable or fixed effects into account, claims otherwise, participation loans are more likely to default than conventional loans when borrower, loan and bank characteristics are controlled for. The hypothesis is rejected regardless of the inclusion of year-month, financing and city fixed effects. Moreover, when interest rate is excluded from the model, the results do not change. This is contrary to the findings of Baele et al. (2014).

The models (5) and (7) reported in Table 7 indicate the comparison of the loans of dual borrowers and borrowers who borrow from only participation banks. The loans belonging to dual borrowers survive less compared to the loans belonging to borrowers who borrow from only participation banks. This finding is consistent with the findings of Baele et al. (2014). In addition, the loans of dual borrowers are found to be more

likely to default compared to the loans of borrowers who get loans only from conventional banks. A possible explanation for this finding is that firms exceeding loan limits from conventional loans may try to take additional loan from participation banks. However, purely borrowing from participation bank may be related to religious motivation. If that is the case, then relatively more religious, so more risk averse borrowers as argued by Hess (2012) with the assumption that religiosity-risk averse relationship is valid for religious people in Turkey as well, may be the reason for lower credit risk compared to dual borrowers. The counter argument is that the borrowers, who could not borrow from conventional banks if they are too risky, get loan from participation banks. If that was the case, it is expected that the loans of these borrowers should have been riskier than loans of dual borrowers. Therefore, there can be religious motivation for at least the majority of borrowers who only borrow from participation banks based on the risk aversion-religiosity relationship assumption.

Table 8 further investigates the first null hypothesis for different samples. When loans of borrowers who work with only one bank are analyzed in models (7) and (8) in Table 8, participation loans survive longer if the loan is only loan outstanding for the borrower (model (7)). However, if borrower gets more than one loan, participation loans perform worse (model (8)). This may be related to "soft-budget constraint" issue described by Boot (2000) that perhaps the bank is trying to protect its close relationship with firm, but firms abuse this relationship by taking more risk.

The second null hypothesis that participation and conventional loans of a dual borrower are equally likely to default is rejected. Table 9 presents the results of the continuous parametric survival models with Weibull distribution for a sample of

borrowers who get loans from both participation and conventional banks. The participation loans of dual borrowers are more likely to default than conventional loans after controlling for bank characteristics, firm characteristics and city, year-month and financing fixed effects. The same finding is observed when interest rate is not controlled in the model (5). This finding is also the opposite of what Baele et al. (2014) find for the banks in Pakistan.

The third null hypothesis, which loans are equally likely to default during Ramadan and in the cities where piousness is high, is rejected. Table 12 reports the results of duration models by using different proxies to capture piousness or network effect. The proxies for piousness as well as network effect are Ramadan month indicator, a variable defined by using the number of mosques per capita in the city, a variable using number of Al-Quran course attendees per capita in the city. The proxy for network effect is big city which is defined by a dummy variable which takes the value of one if the population of the city is greater than 750,000 inhabitants. Piousness and network effect proxies are included one by one in the models. Loans are found to be significantly less prone to default during Ramadan period regardless of whether interest rate on loans is controlled or nor in the model. Loans are also found to be less inclined to default in cities where there are more mosques and number of course participants per population, only when the interest rate is not included in the model. The other finding is that loans are more prone to default in big cities.

Ramadan anomaly is also documented by Białkowski et al. (2013). They argue the Ramadan has a positive effect on investor confidence. They also indicate that Ramadan anomaly holds especially in Turkey and in markets where there are more

Muslims. During Ramadan it might be expected that pious borrowers are more likely to be loyal to their loan payments. It can be argued that in cities where there are more mosques, one can expect that network effect may force pious borrowers to be more loyal to their loans. However, the results should be interpreted cautiously because the number of mosque divided by population may be related to the prosperity of a city. The number of Al-Quran course participants per capita in a city may weakly signal overall piousness level. Introducing the interest rate variable seems to capture the effects of piousness and network effect proxies as shown in Table 12. The intuitive reasoning for this finding is that interest rate may capture some of the proxy characteristics because for the cities in which piousness is relatively high, one can expect that interest based instruments would not be demanded highly. Hence, decrease in demand may lead to decrease in interest rate of loans. Including interest rate variable seems to capture also the effect of being a big city as well. This might also be relevant with the demand conditions of loans. Interest rate can be high in cities where there is much more demand for loans.

The further investigation of piousness level is shown in Table 13. Table 13 reports the results of continuous survival models with additional interaction variables between a dummy variable for participation loans and religiosity proxies. The models (1) to (4) reported in Table 13 present the maximum likelihood estimation results for duration analyses with Weibull distribution as a baseline hazard function for the whole sample. The models (5) to (12) report the results for samples of loans taken by small and large firms. Interestingly, participation loans during Ramadan are found to be more likely to default for the whole sample. This result also holds for small firms sample; i.e

participation loans taken by small firms during Ramadan are more likely to default as shown in the model (6). However, for large firms the coefficient is insignificant. Although loans taken in big cities are more likely to fail for the whole sample, loans taken by large firms in big cities are less likely to default. Two religiosity proxies (more_mosque and more_coursier) are found to be negatively associated with hazard rate in case of large sample. That is, both conventional and participation loans taken by large firms in cities where there are more mosques and more attendees of Al-Quran courses per population, are found to be less inclined to default compared to other cities. Moreover, the absolute value of these coefficients on interaction terms with participation loans for large firms is higher than the coefficients of city characteristics. It seems that large firms getting participation loans from more religious cities are less likely to default, so they are more loyal to their loans in these cities.

Dietsch and Joel (2004) find that SMEs are riskier than large firms. Therefore, Altman and Sabato (2007) suggest separating large and small firms in terms of their credit risk. Models (1) and (2) reported in Table 8 investigate the default rates of loans borrowed by small firms. It is important to remind that small and large firms are classified by their total amount of loans granted by all banks during the sample period. A firm is classified as small firm in terms of their total assets or sales. It is found that participation loans of small firms are more likely to default than conventional loans of small firms. This finding does not change, if borrower borrows only from participation bank or borrows from participation and conventional banks. Models (3) and (4) reported in Table 8 investigate whether participation loans are different from conventional loans in terms of credit risk for a sample of large firms. The participation

loans are found to be riskier than conventional loans for these firms as well. Moreover, when I compare the model (1) and (3) in Table 8, participation loans of large firms are more likely to default compared to participation loans of small firms. In addition, participation loans of large firms are more likely to default with the passage of survival time since the duration dependence of such loans are higher in magnitude than duration dependence of small firm loans. All of the models reported in Table 8 control for borrower, loan and bank characteristics and year-month, financing and city fixed effects.

The second hypothesis is also tested separately for small and large firms. Table 11 indicates continuous survival analyses results of the models for small and large firms which are dual borrowers. As shown in Table 11, the findings for the whole sample are valid for small and large dual borrowers. The absolute value of coefficients on parsenior and consenior variables are higher for small firms than large firms, suggesting that loans of small dual borrower firms taking loans initially from conventional banks are more risky compared to loans of large dual borrowers taking loans initially from conventional banks.

Participation banks in Turkey are neither small nor big in terms of asset size. Therefore, comparing participation banks with large banks may distort findings. The loans granted by large banks are excluded from the sample, and models are estimated for the sample of loans given by small and medium sized banks in some of the models. The results of the models are reported in columns (5) and (6) in Table 8 as well as columns (5), (6), and (7) in Table 10. In a similar size setting, participation loans still perform worse than conventional loans in terms of credit risk while controlling for

year-month, city and financing fixed effects as reported in columns (5) and (6) in Table 8. Worse performance of participation loans is observed also for participation loans of dual borrowers as reported in columns (5), (6) and (7) in Table 10.

Some of the findings with respect to control variables are contrary to the expectations. For example, the longer maturity is associated with lower default rate. It may be related to screening hypothesis that long term loans are monitored more carefully (Jiménez and Saurina, 2004). Such screening hypothesis may be valid to explain the negative coefficient found on collateral variable. There is no clear cut expectation about the sign of this coefficient. Jiménez and Saurina (2004) argue that collateral may be positively or negatively associated with probability of default. Negative association is possible as long as moral hazard may be alleviated with collateral. It might be the case that borrowers avoid to default when they have collateral, since they have more to lose in case of default. The interest rate/(financing rate for participation banks) is found to have negative coefficient. Higher levels of interest rate may be understood as higher risk for customer, so the bankers examine those more strictly, resulting in lower default rate.

When borrower characteristics are examined, the size of borrower is found to be negatively associated with default rate in general. Banks may screen large firms vigilantly which is consistent with screening hypothesis (Jiménez and Saurina, 2004). Loans of borrowers working with more than one bank –multiplebank variable-, holding all else constant, are more likely to default as shown in Table 7. It may be the case that riskiness of borrower forces him to take additional loans from other banks because of reaching the borrowing limit from a single bank. However, the size effect is observed

for small firms as shown in the columns (1) and (2) in Table 8. It seems that loans of large firms are less likely to default if the large firm works with multiple banks. The intuition behind this is that banks monitor carefully large firms to protect their claims, since now they have competitors and more to lose in case of default (Jimenez and Saurina, 2004).

The bank control variables also provide interesting results. As expected, loans granted by the state banks are more likely to default when year-month, financing and city fixed effects are controlled and interest rate is excluded as in the model (7) reported in Table 7. Similarly, loans of investment banks are found to be riskier than loans of deposit banks while controlling for fixed effects as again shown in the model (7) reported in Table 7. It is notable that investment banks seem to be good at picking small firms as shown in Table 8. The "soft-budget constraint" issue stated by Boot (2000) can explain higher credit risk of large firms and firms that get multiple loans from a single bank (Models (3) and (8) reported in Table 8). Boot (2000) argues that banks may be loose in imposing requirement of debt contracts because of their close relationship with these firms. These firms seem to exploit firm-bank relationship.

Loans taken from large banks are more likely to default as shown in Table 8. This finding that large banks are riskier is consistent with the findings of Čihák and Hesse (2010). It can be explained by the too-big-to-fail hypothesis.

Although loans of small firms taken by foreign banks perform worse, it seems that foreign banks are good in picking large firms (Models (1) and (3) in Table 8). Şahin and Doğukanli(2014) argue that foreign banks provide loans to less risky and

more transparent firms. It seems that foreign banks prefer quality borrowers, so they are able to manage credit risk even in multiple lendings.

Two explanations can be proposed to explain why the findings for Turkish banks differ from the findings of Baele et al. (2014) for the first and second hypotheses ie, having higher default rates for loans given by participation banks.

First of all, the aggressive growth strategies of participation banks in Turkey and government support for the target of 15% market share for participation banks in 2023 may partly explain the comparatively higher credit risk of participation banks. It might be related to moral hazard hypothesis (Saeed and Izzeldin, 2014) that managers of participation banks may feel to be forced to increase their loan size while sacrificing the performance of loans. The target of high market share (15% in 2023) might pressure managers of participation banks to extend excessive credits. Moreover, as shown in Table 2, operational expense to average total assets of participation banks is at downward trend. This may imply two options: either operational efficiency increases or risk management practices are reduced (moral hazard).

Second, bad luck hypothesis stated by Saeed and Izzeldin (2014) might be valid. This hypothesis claims that since participation banks can not charge penalties for overdue loans, the risky borrowers has an incentive to prefer Islamic banks. This is what I see empirically in table 10 with consenior variable. It seems that the loans of borrowers who borrow first from conventional bank then from participation bank are more inclined to default. The magnitude of this coefficient is even higher in case of

small firms. That is, loans of small firms switching to participation banks seem to be riskier than loans of large firms switching to participation banks.

8.2 Robustness Checks

Several robustness checks are employed to examine whether the findings are robust. First, right censored observations are excluded from the sample. Although this procedure eliminates right censoring problem, it is not recommended because these observations carry important information so excluding them creates a sample selection bias. The excluded observations are more likely to have higher maturity and/or granted close to the end of sample period. Table 14 reports the results of the maximum likelihood estimation of continuous duration models with Weibull distribution for the sample of loans excluding right censored observations in models. Columns (1) and (2) of Table 14 reject the first null hypothesis similar to previous finding that participation loans are more likely to default compared to conventional loans. Models reported in columns (3), (4) and (5) in Table 14 test the second null hypothesis. Participation loans of dual borrowers survive less compared to conventional loans of dual borrowers. In models reported in columns (6), (7), (8) and (9) in Table 14, the coefficients of piousness and network effect proxies are similar to the coefficients for the whole sample. Among the control variables, the coefficient of maturity has changed. When the right censored observations are excluded, higher maturity loans are found to be more likely to default. The difference can be explained by the exclusion of loans with higher maturity from the sample. The coefficients of state bank and foreign bank are also found to be sensitive to the exclusion of right censored observations from the sample.

As a second robustness check, the definition of default is changed. The banking regulation classifies a loan as default when loan payment is being 90 days or more overdue. Table 15 reports results of the the maximum likelihood estimation of duration models with Weibull distribution with new default definition; that is, 180 or more days overdue of loan payment. Results are consistent with the findings of previous comparable models. The only difference is observed for the borrowers getting a single loan form a single bank. It is found that the default rate of participation loans of those borrowers is not found to be significantly different from the default rate of conventional loans, as reported in column (5) in Table 15.

One of the assumptions made in grouping the loan information is that there are no duplicate observations for a single loan in the data set. Therefore, a loan is assumed to be unique if it is issued by a bank from a branch with the same financing code, the same original maturity and same starting date. However there might be duplicate observations with above mentioned characteristics. These observations either represent another loan or they are "duplicate" because of misreporting. Therefore as a robustness check, the so called "duplicate" observations are excluded from the model. Table 16 reports the results of the maximum likelihood estimations of the duration models, excluding duplicate observations from the sample. The participation loans are more likely to default compared to conventional loans for all borrowers and also for dual borrowers. During Ramadan, loans are less likely to default. Loans in cities where there are more number of mosques per capita are also less prone to default. However, the negative association between more attendees of Al-Quran courses per population in a city -more_coursier variable- with default rate disappears in this sample. Loans of dual

borrowers, who first borrow from conventional banks then from participation banks, are positively associated with hazard rate. The major findings are similar to previous ones.

Fourth, a discrete survival time analysis is employed. Treating the survival time as continuous or discrete requires the robustness check. The reason is that loans default on a certain date, but the default of loans are grouped in time intervals such as months. Moreover, Weibull regression restricts the baseline hazard to be linear. Therefore, no baseline hazard assumption should be tested. Complementary log-log regression can be used in discrete analysis.

The discrete model for the analysis can be shown as follows for complementary log log regression (Jenkins, 2005)

$$cloglog[h(j,X)] = D(j) + \beta' X \qquad (2)$$

Where , j= Discrete time specification and $D(j)$ = Baseline hazard function

Dependent variable is default of a loan in a certain month in case of discrete model. D(j) stands for duration dependence (baseline hazard). In baseline discrete model there is no functional form assumption for duration dependence. Natural logarithm of survival time is assumed to compare results with results of continuous Weibull model. Table 17 reports the test results of three hypotheses with discrete model setting. Three null hypotheses are rejected. The previous results are supported with the discrete time models while controlling for loan, borrower and bank characteristics, as well as year-month, financing and city fixed effects.

CHAPTER 9

CONCLUSION

In this study, I compare the default rates of loans issued by participation and conventional banks during the period January 2011 - December 2012 in Turkey. Banks provided more than 4 million loans to firms during this period. Three hypotheses are tested. The first hypothesis is that participation loans are equally likely to default compared to conventional loans controlling for loan, bank and borrower characteristic and fixed effects. The second hypothesis tests default rates for the dual borrowers. The third hypothesis is related with the default rates and proxies used for piousness.

I find that participation loans are more likely to default than conventional loans, controlling for borrower, loan and bank characteristics. Loans of firms working with only participation banks are found to be less prone to default compared to loans of firms working with both participation and conventional banks. When the firms that borrow from both types of banks are examined, participation loans are more likely to default. Loans are less inclined to default during Ramadan. Large firm loans are found to survive longer in cities where the population is high, where there are proportionately more mosques and more Al-Quran course participants per population. The findings are found to be robust to the identification of loans, continuous or discrete survival time specification of the model, and default specification.

There are some limitations for these analyses that should be kept in mind. In order to identify a loan, it is assumed that a single loan is unique if it is issued by a bank from a branch with the same financing code, the same original maturity and same starting date. This assumption may affect the results, since misreported –duplicate- observations may be counted as a different loan. In order to overcome this problem, I exclude these duplicate observations. Moreover, the size of data requires a trade-off between sample size and sample period. I used two years of data. Although it is not a long period, there are more than 18.5 million loan month observations. Another limitation is the use of loan amount in clarifying large and small firms. Total loan amount granted only during the sample period may not adequately represent the true firm size. The reason is that there may be loans given before or after the sample period. Finally, the piousness proxies are questionable. The true piousness level is hard to measure. The proxies in this thesis may capture some other effects and it is hard to separate those effects. For example number of mosques per population in a city may capture the wealth effect of city. Piousness of firm may not necessarily be linked to overall piousness of the city .A survey conducted for the firm may be more direct indicator for piousness.

There are several policy implications of our empirical findings. First, the balanced growth of the participation banks may be supported rather than aggressive growth strategies. They may be extending to riskier borrowers because of high market share targets. Second, SME financing is important in the economies since SMEs contributes to job creation as well as economic growth. It seems that participation banks may increase financing to SMEs with a high share in their loan portfolio. However, the

SME function of the participation banks can be further enhanced with a prudential manner. PLS mechanism can support this function. The other finding that most of the borrowers of participation banks also borrow from conventional banks implies that participation banks fail somehow to attract conservative -so risk averse- customers. Enhancing the trust for the products of participation banks and increasing the standardization of legal framework for such products may be considered to attract religious -less risky- borrowers.

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APPENDICES

APPENDIX A: BANKS IN TURKEY

Table 1. First Glance of Turkish Banking System								
	Banking Sector				Participation Banks			
	2011	2012	2013	2014	2011	2012	2013	2014
Share of total assets in the banking sector (%)					4.6	5.1	5.5	5.2
Assets (% of GDP)	93.8	96.7	110.7	113.3*	4.3	5.0	6.1	6.0*
Loans/Total Assets	56.1	58.0	60.5	62.2	68.6	68.2	64.6	61.5
Government securities/Total assets	23.4	19.7	16.6	15.2	3.5	3.5	5.0	6.5
Loans/Total deposits	98.2	102.9	110.7	117.9	98.3	100.1	101.2	98.2
Year-on-year loan growth	29.9	16.4	31.8	18.5	25.0	24.5	29.3	3.3
Deposits/Total assets	57.1	56.3	54.6	52.8	69.9	68.2	63.8	62.6
Funds borrowed/total assets	14.2	13.2	15.4	15.7	11.5	13.1	15.9	14.3
NPLs (gross,% of total loans)	2.8	2.9	2.8	2.9	3.2	3.2	3.6	5.0
Provisioning ratio	79.4	75.2	76.3	73.9	65.4	75.1	63.2	62.4
Source: CBRT Table reports some characteristics of deposit and participation banks for the period of 2011-2014. * denotes the data as of 2014Q3.								

Table 2. Profitability Indicators

%		Net Income / Average Total Assets (%)			Net Income / Average Shareholder's Equity (%)			Net Interest (Profit) Revenues (Expenses) / Average Total Assets (%)			Fees, Commission and Banking Services Revenues / Average Total Assets (%)			Operational Expenses / Average Total Assets (%)		
Year	Month	Sector	Deposit	Participation	Sector	Deposit	Participation	Sector	Deposit	Participation	Sector	Deposit	Participation	Sector	Deposit	Participation
2006	12	2.60	2.49	3.31	21.01	22.24	30.76	4.85	4.76	5.54	1.90	3.07	4.14	3.08	1.91	3.31
2007	12	2.78	2.69	3.14	24.77	26.63	30.72	4.88	4.80	5.41	1.94	3.01	4.04	3.01	1.93	3.47
2008	12	2.05	1.94	2.84	18.74	19.86	24.12	4.72	4.61	5.41	1.91	3.04	4.13	3.04	1.90	3.46
2009	12	2.63	2.59	2.35	22.92	25.24	18.99	5.44	5.43	5.17	1.80	2.72	3.79	2.73	1.80	2.88
2010	12	2.46	2.46	2.02	20.12	22.17	16.86	4.30	4.30	4.01	1.60	2.62	3.45	2.63	1.60	2.31
2011	12	1.74	1.73	1.62	15.48	16.76	14.84	3.46	3.43	3.68	1.50	2.30	3.03	2.31	1.50	2.06
2012	12	1.83	1.84	1.47	15.68	16.81	14.69	4.07	4.08	3.98	1.50	2.35	2.98	2.35	1.52	1.99
2013	12	1.60	1.61	1.26	14.19	15.11	13.75	3.72	3.74	3.45	1.46	2.30	2.69	2.28	1.49	1.65
2014	12	1.33	1.36	0.15	12.25	13.29	1.58	3.53	3.55	3.21	1.39	2.11	2.71	2.11	1.43	1.49

Source: BRSA Statistics

Table reports profitability measures of participation and deposit banks in Turkey over the period of 2006-2014. Deposit banks do not include investment and development banks.

APPENDIX B: DESCRIPTIVE STATISTICS, MAIN FINDINGS AND ROBUSTNESS CHECKS

Table 3. Sample Characteristics		
Variable	**Unit**	**Number of Observations**
Original loan month observations	Loan-Month	47,741,789
Exclusion of loans given to government, banking and international institutions and/or opened before sample period and/or missing variables	Loan-Month	29,228,095
Total sample loan-month observations	Loan-Month	18,513,694
Participation Banking observations	Loan-Month	2,089,786
Conventional Banking observations	Loan-Month	16,423,908

Table 4. Descriptive Statistics of Loan Observations					
		Unit	**Conventional**	**Participation**	**Sector**
def_loan	=1 if loan defaults(90 days overdue), =0 otherwise	%	0.0286	0.0311	0.0288
def_loan2	=1 if loan defaults (180 day overdue), =0 otherwise	%	0.0184	0.0226	0.0187
diff	=1 if there are many loans for a borrower; =0 otherwise	%	0.9777	0.9914	0.9789
collateral	=1 if the loan is collateralized; =0 otherwise	%	0.7902	0.9303	0.8024
loan_ amount	the loan amount at opening	1,000 TRY	152.3951	123.2842	149.8632
sum collateral	the collateral amount of loan at opening	1,000 TRY	144.4398	92.3582	139.9101
intrate	interest rate of loan	%	14.2514	12.5253	14.0966
loandegree	Regulation based loan degree, 1=highest - 5=lowest degree	Unit	1.0799	1.0558	1.0778
maturity	time to original maturity in terms of month	Months	11.1452	9.5969	11.0106
borr_ conventional	=1 if a borrower borrows from conventional bank only; =0 otherwise	%	0.7701	-	0.7031
borr_ participation	=1 if a borrower borrows from participation bank only; =0 otherwise	%	-	0.1923	0.0167
twotype	=1 if a borrower borrows from two type of banks; =0 otherwise	%	0.2299	0.8077	0.2802
agriculture	=1 if loan is for agriculture; =0 otherwise	%	0.0292	0.0280	0.0291
construction	=1 if loan is for construction; =0 otherwise	%	0.1044	0.1579	0.1091
manufacturing	=1 if loan is for manufacturing; =0 otherwise	%	0.3425	0.3272	0.3412
mining	=1 if loan is for mining; =0 otherwise	%	0.0108	0.0130	0.0110
education	=1 if loan is for education; =0 otherwise	%	0.0043	0.0100	0.0048
electricity	=1 if loan is for electricity; =0 otherwise	%	0.0039	0.0076	0.0043
wholesale trade	=1 if loan is for wholesaletrade; =0 otherwise	%	0.3169	0.2587	0.3118
transporting	=1 if loan is for transporting; =0 otherwise	%	0.0540	0.0277	0.0517
fishing	=1 if loan is for fishing; =0 otherwise	%	0.0013	0.0015	0.0013
health	=1 if loan is for health; =0 otherwise	%	0.0120	0.0161	0.0123
hotel	=1 if loan is for hotel; =0 otherwise	%	0.0189	0.0080	0.0180
individual	=1 if loan is for individual;	%	0.0733	0.1255	0.0778

Table 4. Descriptive Statistics of Loan Observations (Cont'd)					
		Unit	**Conventional**	**Participation**	**Sector**
	=0 otherwise				
renting	=1 if loan is for renting; =0 otherwise	%	0.0283	0.0188	0.0275
large_firm	=1 if sum of loans by borrower is > 75th percentile, =0 otherwise	%	0.2507	0.4332	0.2665
small_firm	=1 if sum of loans by borrower is < 25th percentile, =0 otherwise	%	0.2511	0.1424	0.2416
part_loan	=1 if participation bank; =0 otherwise	%	0.0000	1.0000	0.0870
privatebank	=1 if bank is private domestic; =0 otherwise	%	0.5738	-	0.5239
investment bank	=1 if bank is investment or development bank; =0 otherwise	%	0.0014	-	0.0012
foreignbank	=1 if bank is foreign bank; =0 otherwise	%	0.2150	-	0.1963
largebank	=1 if TRY total assets of bank is > 75th percentile; =0 otherwise	%	0.8783	-	0.8019
smallbank	=1 if TRY total assets of bank is < 25th percentile; =0 otherwise	%	0.0011	-	0.0010
bigcity	=1 if pop>750000; =0 otherwise	%	0.8734	0.8711	0.8732
Right censoring	=1 if maturity of loan is greater than sample end-period; =0 otherwise	%	0.3743	0.3547	0.3726
Number of Loans		**Number**	**4,080,559**	**388,711**	**4,469,270**

Table reports the descriptive statistics of loan observations. Shares of variable with respect to sub-total and total loans are shown. The reported loan characteristics represent the characteristics at the time of loan origination. TRY=Turkish Lira

Table 5. Variables Indicating Borrower Characteristics					
		Unit	**Conventional Share/Number**	**Participation Share/Number**	**Sector Share/Number**
def_borr	=1 if borrower defaults,=0 otherwise	% Number	0.0862 28,027	0.0521 1,643	0.0862 28,898
def_borr2	=1 if borrower defaults (180 days overdue),=0 otherwise	% Number	0.0601 19,692	0.0416 1,310	0.0600 20,430
borr_participation	=1 if a borrower borrows from participation bank only; =0 otherwise	% Number	- -	0.3201 10,088	- -
borr_convent	=1 if a borrower borrows from conventional bank only; =0 otherwise	% Number	0.9341 303,578	- -	- -
twotype	=1 if a borrower borrows from two type of banks; =0 otherwise	% Number	0.0659 21,422	0.6799 21,422	0.0639 21,422
ldegree	=1 if participation bank sees loans of borrower less risky; =0 otherwise	% of two type borrowers Number	- -	0.1565 3.352	- -
bdegree	=1 if participation bank sees a borrower less risky; =0 otherwise	% of two type borrowers Number	- -	0.0820 1,756	- -
diff	=1 if there are many loans for a borrower; =0 otherwise	% Number	0.6968 226,451	0.4561 14,371	0.7187 240,822
consenior	=1 if conventional loan has early initiation; =0 otherwise	% of two type borrowers Number	0.0417 13,576	0.6337 13,576	- -
parsenior	=1 if participation loan has early initiation; =0 otherwise	% of two type borrowers Number	0.0234 7,614	0.3554 7,614	- -
multiplebank	=1 if borrower borrows from multiple number of banks; =0 otherwise	% Number	0.3145 102,215	0,2798 8814	0.3313 111,029
Number of Borrowers			**325,000**	**31,510**	**335,088**
Table reports the descriptive statistics of loan observations. Shares indicate either number of borrowers for the variable divided by number of total borrowers or divided by number of two type bank borrowers . Reported borrower characteristics represent the initial characteristics.					

Table 6. Descriptive Statistics of Loan-Month Observations							
		Conventional		Participation		Sector	
		Number	Share	Number	Share	Number	Share
Loan Performance:							
tga	=1 if loan defaults certain month; =0 otherwise	116,759	0.0073	12,100	0.0059	128,859	0.0071
tga2	=1 if loan defaults (180 day overdue) certain month; =0 otherwise	74,945	0.0046	8,784	0.0043	83,729	0.0046
Borrower Characteristics:							
twotype	=1 if a borrower borrows from two types of banks; =0 otherwise	3,614,117	0.2201	1,704,918	0.8158	5,319,035	0.2873
borr_participation	=1 if a borrower borrows from participation bank only; =0 otherwise	-	-	384,868	0.1842	384,868	0.0208
borr_convent	=1 if a borrower borrows from conventional bank only; =0 otherwise	12,809,791	0.7799	-	-	12,809,791	0.6919
large_firm	=1 if sum of loans by borrower is > 75th percentile, =0 otherwise	3,664,306	0.2231	963,533	0.4611	4,627,839	0.2500
small_firm	=1 if sum of loans by borrower is < 25th percentile, =0 otherwise	4,373,602	0.2663	233,969	0.1120	4,607,571	0.2489
consenior	=1 if conventional loan has early initiation; =0 otherwise	2,820,657	0.7971	774,567	0.4691	3,595,224	0.6927
parsenior	=1 if participation loan has early initiation; =0 otherwise	718,169	0.2029	876,677	0.5309	1,594,846	0.3073
diff	=1 if there are many loans for a borrower; =0 otherwise	15,835,081	0.9641	2,061,382	0.9864	17,896,463	0.9667
size	sum of all loans taken by borrower from all banks		2,755.0026		5,683.6132		3,085.5778
lnsize	the natural log of the sum of all loans taken by borrower from all banks	-	6.0677	-	7.1525	-	6.1901
ldegree	=1 if participation bank sees loans of borrower less risky; =0 otherwise	908,728	0.2514	324,734	0.1905	1,233,462	0.2319
bdegree	=1 if participation bank sees a borrower less risky; =0 otherwise	329,665	0.0912	78,766	0.0462	408,431	0.0768

Table 6. Descriptive Statistics of Loan-Month Observations								**(Cont'd)**
		Conventional		Participation		Sector		
multiplebank	=1 if borrower borrows from multiple number of banks; =0 otherwise	12,334,176	0.7510	1,862,085	0.8910	14,196,261	0.7668	
Loan Characteristics:								
collateral	=1 if the loan is collateralized; =0 otherwise	14,007,283	0.8529	1,990,317	0.9524	15,997,600	0.8641	
sumcollateral	the collateral amount of loan	-	158.3252	-	96.2061	-	151.3133	
lnsumcollateral	the natural log of collateral amount of loan	-	2.1476	-	3.0622	-	2.2508	
col_size	the highest collateral amount of loan	-	215.9481	-	127.5723	-	205.9724	
lncol_size	the natural log of the highest collateral amount of loan	-	2.8342	-	3.5990	-	2.9205	
ymloandegree	Monthly regulatory degree of loan, =1 Highest, =5 Lowest	-	1.1198	-	1.1081	-	1.1185	
intrate	interest rate of loan	-	13.4014	-	14.4490	-	14.0900	
loan_amount	the loan amount	-	136.8164	-	119.6588	-	134.8797	
lnloan_amount	the natural log of the loan amount	-	3.5696	-	3.7356	-	3.5884	
loansize	the highest loan amount	-	161.4622	-	154.0145	-	160.6216	
maturity	time to original maturity in terms of month	-	16.5386	-	12.8828	-	16.1259	
longmaturity	=1 if maturity of loan is greater than 75th percentile; =0 otherwise	4,365,038	0.2658	228,450	0.1093	4,593,488	0.2481	
shortmaturity	=1 if maturity of loan is less than 25th percentile; =0 otherwise	4,096,611	0.2494	456,579	0.2185	4,553,190	0.2459	
rightcensoring	=1 if maturity of loan is greater than sample end-period; =0 otherwise	7,858,636	0.4785	822,101	0.3934	8,680,737	0.4689	
agriculture	=1 if loan is for agriculture; =0 otherwise	528,826	0.0322	58,486	0.0280	587,312	0.0317	
construction	=1 if loan is for construction; =0 otherwise	1,745,784	0.1063	377,439	0.1806	2,123,223	0.1147	
manufacturing	=1 if loan is for manufacturing; =0 otherwise	5,535,531	0.3370	780,370	0.3734	6,315,901	0.3411	
mining	=1 if loan is for mining; =0 otherwise	168,215	0.0102	28,316	0.0135	196,531	0.0106	
education	=1 if loan is for education; =0 otherwise	89,563	0.0055	20,988	0.0100	110,551	0.0060	

Table 6. Descriptive Statistics of Loan-Month Observations							**(Cont'd)**
		Conventional		Participation		Sector	
electricity	=1 if loan is for electricity; =0 otherwise	57,839	0.0035	16,536	0.0079	74,375	0.0040
wholesaletrade	=1 if loan is for wholesaletrade; =0 otherwise	5,620,764	0.3422	572,268	0.2738	6,193,032	0.3345
transporting	=1 if loan is for transporting; =0 otherwise	1,166,982	0.0711	68,907	0.0330	1,235,889	0.0668
fishing	=1 if loan is for fishing; =0 otherwise	24,766	0.0015	3,255	0.0016	28,021	0.0015
health	=1 if loan is for health; =0 otherwise	213,581	0.0130	39,100	0.0187	252,681	0.0136
hotel	=1 if loan is for hotel; =0 otherwise	354,062	0.0216	19,313	0.0092	373,375	0.0202
individual	=1 if loan is for individual; =0 otherwise	402,536	0.0245	59,848	0.0286	462,384	0.0250
renting	=1 if loan is for renting; =0 otherwise	515,568	0.0314	44,960	0.0215	560,528	0.0303
Bank Characteristics:							
largebank	=1 if TRY total assets of bank is > 75th percentile; =0 otherwise	15,092,845	0.9190	-	-	15,092,845	0.8152
smallbank	=1 if TRY total assets of bank is > 75th percentile; =0 otherwise	9,336	0.0006	-	-	9,336	0.0005
privatebank	=1 if bank is private domestic; =0 otherwise	9,007,367	0.5484	-	-	9,007,367	0.4865
statebank	=1 if bank is state bank; =0 otherwise	4,472,932	0.2723	-	-	4,472,932	0.2416
foreignbank	=1 if bank is foreign bank; =0 otherwise	2,922,617	0.1779	-	-	2,922,617	0.1579
investmentbank	=1 if bank is investment or development bank; =0 otherwise	20,933	0.0013	-	-	20,933	0.0011
City Characteristics:							
bigcity	=1 if pop>750000; =0 otherwise	14,058,871	0.8560	1,852,586	0.8865	15,911,457	0.8594
more_mosque	=1 if # of mosques divided by population > 75th percentile; =0 otherwise	633,819	0.0386	63,577	0.0304	697,396	0.0377
few_mosque	=1 if # of mosques divided by population < 25th percentile; =0 otherwise	12,546,251	0.7639	1,638,218	0.7839	14,184,469	0.7662

Table 6. Descriptive Statistics of Loan-Month Observations							**(Cont'd)**
		Conventional		Participation		Sector	
few_coursier	=1 if # of Al-Quran course participants/population < 25th percentile; =0 otherwise	9,898,021	0.6027	1,328,242	0.6356	11,226,263	0.6064
more_coursier	=1 if # of Al-Quran course participants/population > 75th percentile; =0 otherwise	1,176,281	0.0716	115,847	0.0554	1,292,128	0.0698
Time Period:							
ramadan	=1 if Ramadan is at that month; =0 otherwise	1,514,119	0.0922	193,487	0.0926	1,707,606	0.0922
Number of Year-month Observations		16,423,908	-	2,089,786	-	18,513,694	-
Table reports the descriptive statistics of loan-month observations. Shares of variable with respect to sub-total and total loan-month observations are shown.TRY=Turkish Lira							

Table 7. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypothesis 1

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable= Hazard Rate	No Control Variable and No fixed effects	Baseline Model Excluding Year-Month and City Fixed Effects	Baseline Model Excluding Year-Month Fixed Effects	Baseline Model	Baseline Model	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate
Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample
part_loan	-0.196***	2.891***	2.899***	2.209***		1.594***	
	(0.042)	(0.075)	(0.075)	(0.080)		(0.079)	
borr_ participation					0.484***		0.408***
					(0.070)		(0.069)
twotype					0.809***		0.969***
					(0.036)		(0.039)
Loan Characteristics:							
maturity		-0.023***	-0.023***	-0.030***	-0.029***	-0.042***	-0.040***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
collateral		-2.085***	-2.084***	-2.168***	-2.182***	-2.598***	-2.560***
		(0.035)	(0.035)	(0.035)	(0.034)	(0.022)	(0.022)
intrate		-0.146***	-0.146***	-0.127***	-0.117***		
		(0.006)	(0.006)	(0.006)	(0.005)		
Borrower Characteristics:							
lnsize		-0.265***	-0.263***	-0.286***	-0.347***	-0.428***	-0.483***
		(0.009)	(0.009)	(0.009)	(0.009)	(0.011)	(0.010)
diff		0.149***	0.147***	0.101***	0.158***	-0.023	0.059**
		(0.022)	(0.023)	(0.022)	(0.022)	(0.025)	(0.024)
multiplebank		0.178***	0.180***	0.380***	0.264***	0.503***	0.343***
		(0.023)	(0.023)	(0.022)	(0.025)	(0.021)	(0.025)
Bank Characteristics:							
statebank		-0.088***	-0.075**	0.264***	0.240***	0.173***	0.154***
		(0.030)	(0.030)	(0.027)	(0.027)	(0.024)	(0.024)
investment bank		1.864***	1.918***	1.353***	0.157	1.197***	0.361
		(0.276)	(0.281)	(0.295)	(0.291)	(0.352)	(0.334)
foreignbank		-0.208***	-0.200***	0.017	-0.011	0.149***	0.117***
		(0.021)	(0.022)	(0.019)	(0.021)	(0.023)	(0.023)
largebank		2.388***	2.385***	1.676***	0.486***	1.180***	0.418***
		(0.059)	(0.060)	(0.064)	(0.040)	(0.070)	(0.041)
_cons	-5.063***	-4.869***	-4.894***	-8.038***	-6.727***	-7.637***	-6.928***
	(0.016)	(0.085)	(0.113)	(0.255)	(0.248)	(0.242)	(0.236)
Year-Month Fixed Effect	No	No	No	Yes	Yes	Yes	Yes
Financing Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes
City Fixed Effects	No	No	Yes	Yes	Yes	Yes	Yes

Table 7. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypothesis 1 (Cont'd)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable= Hazard Rate	No Control Variable and No fixed effects	Baseline Model Excluding Year-Month and City Fixed Effects	Baseline Model Excluding Year-Month Fixed Effects	Baseline Model	Baseline Model	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate
Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample
Number of loan-months	18,290,806	18,133,124	18,133,124	18,133,124	18,133,124	18,290,806	18,290,806
Number of Loans	4,469,270	4,333,401	4,333,401	4,333,401	4,333,401	4,469,270	4,469,270
Number of borrowers	335,088	333,278	333,278	333,278	333,278	335,088	335,088
Duration Dependence	1.06	1.26	1.26	1.19	1.19	1.21	1.21
log-likelihood	-647,991	-401,792	-400,392	-346,202	-347,386	-406,561	-402,739
Number of regressors	3	26	107	131	132	130	131
chi-squared	21.4***	60,671***	63,470***	125,264***	112,029***	95,346***	87,378***

Table reports the maximum likelihood results of parametric duration models with Weibull distribution. Dependent variable is hazard rate in all models. Model (1) does not include control variables. Through model (2) and (4) fixed effects are included. Model (6) and (7) exclude interest rate . Sample period is between 1:2011 to 12:2012. A For each variable in the specification Table reports the estimated coefficient, statistical significance level and standard error (below in parentheses). In all estimations involving parametric models, standard errors are clustered by borrower.
* p<0.1, ** p<0.05, *** p<0.01

Table 8. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypothesis 1 - Different Samples

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable= Hazard Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate, Diff, Multiple bank variables	Baseline Model Excluding Interest Rate, Diff, Multiple bank variables
Sample	Small Firm	Small Firm	Large Firm	Large Firm	Similar Bank Size	Similar Bank Size	Single Bank-Single Loan	Single Bank-Multiple Loan
part_loan	1.200***		1.639***		2.028***		-0.249*	1.406***
	(0.077)		(0.051)		(0.072)		(0.138)	(0.149)
borr_ participation		0.416***		0.587***		1.216***		
		(0.071)		(0.119)		(0.152)		
twotype		0.525***		1.133***		2.008***		
		(0.051)		(0.025)		(0.124)		
Loan Characteristics:								
maturity	-0.037***	-0.037***	-0.053***	-0.051***	-0.062***	-0.059***	-0.041***	-0.036***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.005)	(0.005)	(0.001)	(0.001)
collateral	-2.144***	-2.138***	-2.988***	-2.965***	-2.854***	-2.783***	-1.817***	-2.348***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.061)	(0.058)	(0.030)	(0.030)
Borrower Characteristics:								
lnsize	-0.577***	-0.581***	-0.228***	-0.255***	-0.267***	-0.294***	-0.588***	-0.697***
	(0.007)	(0.007)	(0.010)	(0.011)	(0.021)	(0.021)	(0.010)	(0.011)
diff	0.281***	0.283***	-0.509	-0.540	0.566***	0.587***		
	(0.020)	(0.020)	(0.512)	(0.512)	(0.099)	(0.099)		
Multiple bank	0.344***	0.280***	0.163	-0.482***	0.174**	-0.632***		
	(0.021)	(0.023)	(0.106)	(0.110)	(0.085)	(0.164)		
Bank Characteristics:								
statebank	0.101***	0.094***	0.077**	0.047			0.394***	0.139***
	(0.025)	(0.026)	(0.038)	(0.037)			(0.038)	(0.036)
investment bank	-0.616	-1.214	1.550***	0.562***	1.376***	0.476*	0.375	1.668*
	(0.921)	(0.912)	(0.178)	(0.173)	(0.323)	(0.244)	(0.474)	(0.851)
Foreign bank	0.214***	0.207***	-0.228***	-0.340***	0.734**	0.178	0.252***	-0.117***
	(0.021)	(0.022)	(0.026)	(0.025)	(0.299)	(0.143)	(0.033)	(0.034)
largebank	1.280***	0.642***	1.227***	0.277***			0.315**	1.383***
	(0.067)	(0.050)	(0.047)	(0.023)			(0.128)	(0.132)
_cons	-7.308***	-6.726***	-23.402	-23.995	-8.963***	-8.452***	-2.750***	-5.964***
	(0.238)	(0.235)	(1815.120)	(4598.340)	(0.591)	(0.598)	(0.374)	(0.364)
Year-Month Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Financing Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 8. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypothesis 1 - Different Samples (Cont'd)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable= Hazard Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate, Diff, Multiple bank variables	Baseline Model Excluding Interest Rate, Diff, Multiple bank variables
Sample	Small Firm	Small Firm	Large Firm	Large Firm	Similar Bank Size	Similar Bank Size	Single Bank-Single Loan	Single Bank-Multiple Loan
Number of loan-months	3,869,472	3,869,472	3,901,955	3,901,955	3,393,689	3,393,689	597,732	3,626,234
Number of Loans	1,222,650	1,222,650	1,268,023	1,268,023	885,313	885,313	94,266	854,514
Number of borrowers	298,036	298,036			54,909	54,909	94,266	129,793
Duration	1.2	1.2	1.64	1.65	1.34	1.38	1.04	1.13
Dependence								
log-likelihood	-160,056	-160,029	-44,729	-44,192	-47,164	-47,716	-22,059	-111,795
Number of regressors	130	131	130	131	128	129	128	128
chi-squared	80,235***	78,276***	39,441***	40,514***	20,734***	18,691***	34,118***	45,831***

Table reports the maximum likelihood results of parametric duration models with Weibull distribution. Dependent variable is hazard rate in all models. Model (1) and (2) have small firm sample. Model (3) and (4) have large firm sample. Model (5) and (6) are for medium sized and small sized banks. Model (7-8) include loans whose borrowers have one loan outstanding from a single bank. Sample period is between 1:2011 to 12:2012. A For each variable in the specification Table reports the estimated coefficient, statistical significance level and standard error (below in parentheses). Except for model 3 and 4, in all estimations involving parametric models, standard errors are clustered by borrower.

* p<0.1, ** p<0.05, *** p<0.01

Table 9. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypothesis 2

Model	(1)	(2)	(3)	(4)	(5)
Dependent Variable: Hazard Rate	No Control Variables	Baseline Model Excluding Diff, Multiplebank variable, Year-Month and City Fixed Effects	Baseline Model Excluding Diff, Multiplebank variable, Year-Month Fixed Effects	Baseline Model Including Loan Amount, Excluding Diff and Multiple Bank	Baseline Model Excluding Interest Rate, Diff and Multiple Bank
Sample	Dual Borrower	Dual Borrower	Dual Borrower	Dual Borrower	Dual Borrower
part_loan	-0.169***	2.484***	2.484***	1.207***	0.988***
	(0.052)	(0.117)	(0.116)	(0.043)	(0.033)
Loan Characteristics:					
maturity		-0.033***	-0.032***	-0.047***	-0.040***
		(0.003)	(0.003)	(0.001)	(0.001)
collateral		-2.324***	-2.319***	-2.206***	-2.776***
		(0.089)	(0.089)	(0.019)	(0.013)
intrate		-0.112***	-0.110***	-0.076***	
		(0.011)	(0.011)	(0.001)	
lnloan_amount				-0.288***	
				(0.005)	
Borrower Characteristics:					
lnsize		-0.213***	-0.214***	-0.080***	-0.310***
		(0.020)	(0.019)	(0.004)	(0.003)
Bank Characteristics:					
statebank		-0.216***	-0.168**	0.562***	0.112***
		(0.081)	(0.079)	(0.026)	(0.023)
investmentbank		1.390***	1.561***	0.815***	0.752***
		(0.285)	(0.284)	(0.292)	(0.245)
foreignbank		-0.481***	-0.469***	-0.172***	-0.092***
		(0.071)	(0.072)	(0.021)	(0.015)
largebank		2.278***	2.285***	0.943***	1.094***
		(0.095)	(0.096)	(0.041)	(0.032)
_cons	-5.423***	-4.964***	-4.739***	-23.731	-9.492***
	(0.049)	(0.203)	(0.285)	(1064.393)	(1.002)
Year-Month Fixed Effect	No	No	No	Yes	Yes
Financing Fixed Effects	No	Yes	Yes	Yes	Yes
City Fixed Effects	No	No	Yes	Yes	Yes
Number of loan-months	5,261,621	5,221,647	5,221,647	4,004,375	5,261,621
Number of Loans	1,252,197	1,217,765	1,217,765	820,389	1,252,197
Number of borrowers	21,422	21,422	21,422		
Duration Dependence	1.21	1.45	1.45	1.75	1.31
log-likelihood	-162,145	-113,957	-112,270	-47,459	-102,936
Number of regressors	3	24	105	129	128
chi-squared	10.6***	9,206***	36,327***	82,092***	118,615***

Table reports the maximum likelihood results of parametric duration models with Weibull distribution. Dependent variable is hazard rate in all models. Sample period is between 1:2011 to 12:2012. A For each variable in the specification Table reports the estimated coefficient, statistical significance level and standard error (below in parentheses). Model (1) does not include control variables. Model (2) (3) include interest rate variable and additional fixed effects (year-month, financing, city). Model (4) includes interest rate, fixed effects and natural logarithm of loan amount. Model (5) is same as model (4) except excludes natural logarithm of loan amount. In estimations of Model (1) (2) (3), standard errors are clustered by borrower.

* p<0.1, ** p<0.05, *** p<0.01

Table 10. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypothesis 2-Different Bank Size

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable: Hazard Rate	Baseline Model Excluding Diff and Multiple Bank	Baseline Model Excluding Diff and Multiple Bank	Baseline Model Excluding Interest Rate, Diff and Multiple Bank	Baseline Model Excluding Interest Rate, Diff and Multiple Bank	Baseline Model Excluding Interest Rate, Diff, Large bank, State Bank, Multiple Bank	Baseline Model Excluding Interest Rate, Diff, Large bank, State Bank, Multiple Bank	Baseline Model Excluding Interest Rate, Diff, Large bank, State Bank, Multiple Bank
Sample	Dual Borrower	Dual Borrower	Dual Borrower	Dual Borrower	Dual Borrower and Similar Bank Size	Dual Borrower and Similar Bank Size	Dual Borrower and Similar Bank Size
part_loan					1.758***		
					(0.046)		
parsenior	-0.209***		-0.299***			-0.231***	
	(0.014)		(0.014)			(0.022)	
consenior		0.209***		0.299***			0.231***
		(0.014)		(0.014)			(0.022)
Loan Characteristics:							
maturity	-0.029***	-0.029***	-0.038***	-0.038***	-0.065***	-0.061***	-0.061***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
collateral	-2.508***	-2.508***	-2.774***	-2.774***	-2.888***	-2.766***	-2.766***
	(0.014)	(0.014)	(0.013)	(0.013)	(0.021)	(0.021)	(0.021)
intrate	-0.072***	-0.072***					
	(0.001)	(0.001)					
Borrower Characteristics:							
lnsize	-0.268***	-0.268***	-0.318***	-0.318***	-0.244***	-0.271***	-0.271***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.005)
Bank Characteristics:							
statebank	0.196***	0.196***	0.097***	0.097***			
	(0.023)	(0.023)	(0.023)	(0.023)			
investmentbank	-0.444*	-0.444*	-0.207	-0.207	1.313***	-0.276	-0.276
	(0.259)	(0.259)	(0.259)	(0.259)	(0.247)	(0.259)	(0.259)
foreignbank	-0.147***	-0.147***	-0.127***	-0.127***	1.550***	0.119**	0.119**
	(0.016)	(0.016)	(0.015)	(0.015)	(0.062)	(0.047)	(0.047)
largebank	0.135***	0.135***	0.240***	0.240***			
	(0.014)	(0.014)	(0.014)	(0.014)			
_cons	-8.148***	-8.357***	-8.576***	-8.875***	-23.868	-21.382	-21.613
	(1.002)	(1.002)	(1.002)	(1.002)	(2159.149)	(1379.987)	(1379.988)
Year-Month Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Financing Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of loan-months	5,094,395	5,094,395	5,133,712	5,133,712	2,198,503	2,132,552	2,132,552
Number of Loans	1,189,343	1,189,343	1,223,177	1,223,177	491,717	478,187	478,187
Number of borrowers							
Duration Dependence	1.31	1.31	1.33	1.33	1.35	1.43	1.43
log-likelihood	-92,308	-92,308	-101,197	-101,197	-33,289	-33,545	-33,545
Number of regressors	129	129	128	128	127	127	127
chi-squared	120,508***	120,508***	115,969***	115,969***	37,341***	34,628***	34,628***

Table reports the maximum likelihood results of parametric duration models with Weibull distribution. Dependent variable is hazard rate in all models. Sample period is between 1:2011 to 12:2012. All models include year-month, city, financing fixed effects. Model (1) (2) include interest rate variable, while model (3) (4) exclude this variable. Sample is restricted to loans whose borrowers borrow from conventional and participation bank in all models. In models (5) (6) (7) additional restriction to sample is to exclude large banks. For each variable in the specification Table reports the estimated coefficient, statistical significance level and standard error (below in parentheses).* p<0.1, ** p<0.05, *** p<0.01

Table 11. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypothesis 2-Different Firm Size

Model	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable: Hazard Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate
Sample:	Small Firm-Dual Borrower	Small Firm-Dual Borrower	Small Firm-Dual Borrower	Large Firm-Dual Borrowers	Large Firm-Dual Borrowers	Large Firm-Dual Borrowers
part_loan	1.084***			1.055***		
	(0.161)			(0.056)		
parsenior		-0.527***			-0.381***	
		(0.041)			(0.029)	
consenior			0.527***			0.381***
			(0.041)			(0.029)
Loan Characteristics:						
maturity	-0.033***	-0.031***	-0.031***	-0.062***	-0.061***	-0.061***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
collateral	-2.166***	-2.060***	-2.060***	-2.938***	-2.913***	-2.913***
	(0.045)	(0.045)	(0.045)	(0.025)	(0.026)	(0.026)
Borrower Characteristics:						
lnsize	-0.255***	-0.288***	-0.288***	-0.156***	-0.109***	-0.109***
	(0.015)	(0.016)	(0.016)	(0.012)	(0.012)	(0.012)
Bank Characteristics:						
statebank	-0.120	-0.139	-0.139	0.273***	0.233***	0.233***
	(0.101)	(0.101)	(0.101)	(0.044)	(0.043)	(0.043)
investmentbank	-14.356	-15.412	-15.412	0.887***	-0.175	-0.175
	(6283.530)	(6368.524)	(6368.524)	(0.249)	(0.260)	(0.260)
foreignbank	0.315***	0.311***	0.311***	-0.221***	-0.287***	-0.287***
	(0.046)	(0.046)	(0.046)	(0.030)	(0.029)	(0.029)
largebank	1.128***	0.076*	0.076*	0.926***	0.078***	0.078***
	(0.160)	(0.042)	(0.042)	(0.054)	(0.026)	(0.026)
_cons	-9.742***	-8.575***	-9.102***	-23.731	-24.108	-24.488
	(1.027)	(1.017)	(1.017)	(2528.826)	(3990.278)	(3987.228)
Year-Month Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Financing Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of loan-months	182,025	181,276	181,276	2,384,367	2,303,403	2,303,403
Number of Loans	76,113	75,690	75,690	700,722	678,329	678,329
Number of borrowers						
Duration Dependence	1.17	1.18	1.18	1.64	1.66	1.66
log-likelihood	-8,765	-8,648	-8,648	-32,247	-31,570	-31,570
Number of regressors	128	128	128	125	125	125
chi-squared	12,221***	12,249***	12,249***	32,496***	31,808***	31,808***

Table reports the maximum likelihood results of parametric duration models with Weibull distribution. Dependent variable is hazard rate in all models. Sample period is between 1:2011 to 12:2012. All models include year-month, city and financing fixed effects. Models (1) (2) and(3) are based on small firms sample. Models (4)(5) and (6) are based on large firm sample.For each variable in the specification Table reports the estimated coefficient, statistical significance level and standard error (below in parentheses).

* p<0.1, ** p<0.05, *** p<0.01

Table 12. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypothesis 3

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable: Hazard Rate	Baseline Model Excluding Diff, Multiple Bank, Year-Month Fixed Effects	Baseline Model Excluding Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, Year-Month Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects
Sample:	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample
part_loan	2.889***	2.214***	2.214***	2.213***	2.162***	1.599***	1.592***	1.589***
	(0.075)	(0.081)	(0.082)	(0.082)	(0.071)	(0.084)	(0.084)	(0.084)
Period-City Characteristics:								
ramadan	-0.391***				-0.337***			
	(0.015)				(0.015)			
bigcity		0.030				0.164***		
		(0.030)				(0.032)		
more_			-0.063				-0.174***	
mosque			(0.046)				(0.050)	
more_				-0.015				-0.072*
coursier				(0.036)				(0.040)
Loan Characteristics:								
maturity	-0.025***	-0.033***	-0.033***	-0.033***	-0.038***	-0.046***	-0.046***	-0.046***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
collateral	-2.080***	-2.153***	-2.153***	-2.153***	-2.633***	-2.568***	-2.568***	-2.568***
	(0.035)	(0.034)	(0.034)	(0.034)	(0.023)	(0.022)	(0.022)	(0.022)
intrate	-0.146***	-0.129***	-0.129***	-0.129***				
	(0.006)	(0.006)	(0.006)	(0.006)				
Borrower Characteristics:								
lnsize	-0.235***	-0.234***	-0.234***	-0.234***	-0.370***	-0.367***	-0.367***	-0.367***
	(0.008)	(0.007)	(0.007)	(0.007)	(0.009)	(0.009)	(0.009)	(0.009)
Bank Characteristics:								
statebank	-0.090***	0.237***	0.236***	0.235***	-0.330***	0.120***	0.111***	0.108***
	(0.030)	(0.027)	(0.027)	(0.027)	(0.024)	(0.025)	(0.025)	(0.024)
investment	1.920***	1.296***	1.297***	1.296***	1.694***	1.181***	1.182***	1.178***
bank	(0.261)	(0.255)	(0.255)	(0.254)	(0.285)	(0.299)	(0.299)	(0.299)
foreignbank	-0.187***	0.035*	0.035*	0.036*	-0.305***	0.188***	0.194***	0.194***
	(0.022)	(0.019)	(0.019)	(0.019)	(0.026)	(0.023)	(0.023)	(0.023)
largebank	2.366***	1.653***	1.652***	1.651***	1.841***	1.123***	1.112***	1.111***
	(0.060)	(0.067)	(0.067)	(0.067)	(0.061)	(0.076)	(0.076)	(0.076)
_cons	-4.710***	-7.828***	-7.800***	-7.800***	-4.281***	-7.487***	-7.331***	-7.330***
	(0.113)	(0.246)	(0.245)	(0.245)	(0.114)	(0.233)	(0.231)	(0.231)
Year-Month Fixed Effect	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Financing Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City Fixed Effects	Yes	No	No	No	Yes	No	No	No

Table 12. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypothesis 3 (Cont'd)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable: Hazard Rate	Baseline Model Excluding Diff, Multiple Bank, Year-Month Fixed Effects	Baseline Model Excluding Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, Year-Month Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects
Sample:	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample
Number of loan-months	18,133,124	18,133,124	18,133,124	18,133,124	18,290,806	18,290,806	18,290,806	18,290,806
Number of Loans	4,333,401	4,333,401	4,333,401	4,333,401	4,469,270	4,469,270	4,469,270	4,469,270
Number of borrowers	333,278	333,278	333,278	333,278	335,088	335,088	335,088	335,088
Duration Dependence	1.26	1.2	1.2	1.2	1.29	1.22	1.22	1.22
log-likelihood	-400,157	-348,714	-348,712	-348,719	-467,695	-411,014	-411,142	-411,181
Number of regressors	106	49	49	49	105	48	48	48
chi-squared	63,606***	123,174***	123,105***	123,062***	50,854***	88,930***	88,866***	88,724***

Table reports the maximum likelihood results of parametric duration models with Weibull distribution. Dependent variable is hazard rate in all models. Sample period is between 1:2011 to 12:2012. Models include year-month, city and financing fixed effects. Models (1) (2) (3)and(4) include interest rate variable. Models (5)(6)(7) and (8) do not include interest rate variable.For each variable in the specification Table reports the estimated coefficient, statistical significance level and standard error (below in parentheses). In estimations of all models, standard errors are clustered by borrower.

* p<0.1, ** p<0.05, *** p<0.01

Table 13. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypothesis 3 –Different Firm Size

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent Variable: Hazard Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate
Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Small Firm Sample	Small Firm Sample	Small Firm Sample	Small Firm Sample	Large Firm Sample	Large Firm Sample	Large Firm Sample	Large Firm Sample
part_loan	2.147***	1.642***	1.599***	1.603***	1.570***	1.300***	1.159***	1.164***	1.929***	1.941***	1.615***	1.619***
	(0.071)	(0.151)	(0.085)	(0.085)	(0.075)	(0.130)	(0.077)	(0.077)	(0.170)	(0.085)	(0.050)	(0.050)
Period-City Characteristics:												
ramadan	-0.356***				-0.200***				-0.290***			
	(0.016)				(0.017)				(0.075)			
part_loan# ramadan	0.199***				0.138**				0.130			
	(0.050)				(0.065)				(0.113)			
bigcity		0.168***				0.044*				0.101**		
		(0.030)				(0.026)				(0.042)		
part_loan#bigcity		-0.048				-0.151				-0.376***		
		(0.135)				(0.120)				(0.074)		
more_mosque			-0.150***				-0.010				-0.347***	
			(0.050)				(0.045)				(0.088)	
			(.)				(.)				(.)	
part_loan# more_mosque			-0.285				0.160				-1.394***	
			(0.189)				(0.226)				(0.315)	
more_coursier				-0.051				0.016				-0.125**
				(0.039)				(0.035)				(0.055)
part_loan#more_ coursier				-0.293*				-0.006				-1.192***
				(0.153)				(0.173)				(0.205)
Loan Characteristics:												
maturity	-0.038***	-0.046***	-0.046***	-0.046***	-0.034***	-0.042***	-0.042***	-0.042***	-0.061***	-0.057***	-0.058***	-0.057***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.009)	(0.002)	(0.002)	(0.002)
collateral	-2.633***	-2.568***	-2.568***	-2.568***	-2.329***	-2.134***	-2.135***	-2.135***	-2.785***	-3.069***	-3.062***	-3.058***
	(0.023)	(0.022)	(0.022)	(0.022)	(0.023)	(0.023)	(0.023)	(0.023)	(0.098)	(0.023)	(0.023)	(0.023)
Borrower Characteristics:												
lnsize	-0.369***	-0.367***	-0.367***	-0.367***	-0.508***	-0.520***	-0.521***	-0.521***	-0.160**	-0.229***	-0.229***	-0.230***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.007)	(0.007)	(0.007)	(0.007)	(0.079)	(0.010)	(0.010)	(0.010)
Bank Characteristics:												
statebank	-0.331***	0.121***	0.110***	0.107***	-0.368***	0.036	0.031	0.029	-0.396***	0.058	0.060	0.054
	(0.024)	(0.025)	(0.025)	(0.024)	(0.026)	(0.025)	(0.025)	(0.025)	(0.118)	(0.038)	(0.038)	(0.037)
investmentbank	1.695***	1.181***	1.182***	1.179***	0.064	-0.526	-0.527	-0.527	1.655***	1.350***	1.354***	1.351***
	(0.285)	(0.299)	(0.299)	(0.298)	(0.827)	(0.850)	(0.850)	(0.850)	(0.299)	(0.178)	(0.178)	(0.178)
foreignbank	-0.305***	0.188***	0.194***	0.194***	-0.032	0.261***	0.263***	0.263***	-0.630***	-0.255***	-0.252***	-0.249***
	(0.026)	(0.023)	(0.023)	(0.023)	(0.023)	(0.021)	(0.021)	(0.021)	(0.125)	(0.026)	(0.026)	(0.026)
largebank	1.842***	1.123***	1.112***	1.110***	1.768***	1.201***	1.197***	1.196***	1.580***	1.153***	1.155***	1.152***
	(0.061)	(0.076)	(0.076)	(0.076)	(0.065)	(0.066)	(0.066)	(0.066)	(0.165)	(0.046)	(0.046)	(0.046)
_cons	-4.280***	-7.491***	-7.332***	-7.330***	-3.922***	-6.798***	-6.754***	-6.755***	-5.492***	-24.239	-24.136	-24.125
	(0.114)	(0.233)	(0.231)	(0.231)	(0.093)	(0.233)	(0.231)	(0.231)	(0.800)	(2015.332)	(2014.458)	(2014.249)

Table 13. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypothesis 3 –Different Firm Size (Cont'd)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent Variable: Hazard Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate
Sample	Whole Sample	Whole Sample	Whole Sample	Whole Sample	Small Firm Sample	Small Firm Sample	Small Firm Sample	Small Firm Sample	Large Firm Sample	Large Firm Sample	Large Firm Sample	Large Firm Sample
Year-Month Fixed Effect	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Financing Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City Fixed Effects	Yes	No	No	No	Yes	No	No	No	Yes	No	No	No
Number of loan-months	18,290,806	18,290,806	18,290,806	18,290,806	3,869,472	3,869,472	3,869,472	3,869,472	3,901,955	3,901,955	3,901,955	3,901,955
Number of Loans	4,469,270	4,469,270	4,469,270	4,469,270	1,222,650	1,222,650	1,222,650	1,222,650	1,268,023	1,268,023	1,268,023	1,268,023
Number of borrowers	335,088	335,088	335,088	335,088	298,036	298,036	298,036	298,036	19,283			
Duration Dependence	1.29	1.22	1.22	1.22	1.15	1.2	1.2	1.2	1.57	1.66	1.66	1.66
log-likelihood	-467,680	-411,013	-411,131	-411,160	-181,347	-161,616	-161,623	-161,624	-52,352	-46,130	-46,102	-46,104
Number of regressors	111	54	54	54	111	54	54	54	111	54	54	54
chi-squared	50,963***	88,963***	89,056***	88,851***	49,941***	78,818***	78,832***	78,792***	46,346***	36,638***	36,695***	36,690***

Table reports the maximum likelihood results of parametric duration models with Weibull distribution. Dependent variable is hazard rate in all models. Sample period is between 1:2011 to 12:2012. Models include year-month, city and financing fixed effects. Models (1) (2) (3)and(4) are based on whole sample available. Models (5)(6)(7) and (8) are based on small firm sample. Models (9)(10)(11) and (12) are based on large firm sample. Models include interaction terms for Ramadan, big city, more_mosque and more_coursier variables respectively. For each variable in the specification Table reports the estimated coefficient, statistical significance level and standard error (below in parentheses). In estimations of all models except for models (10) (11) and (12), standard errors are clustered by borrower.

* p<0.1, ** p<0.05, *** p<0.01

Table 14. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of hypotheses –Excluding Right Censored Observations

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Test of Hypothesis	Hypothesis 1	Hypothesis 1	Hypothesis 2	Hypothesis 2	Hypothesis 2	Hypothesis 3	Hypothesis 3	Hypothesis 3	Hypothesis 3
Dependent Variable: Hazard Rate	Baseline Model Excluding diff, multiple bank , interest rate	Baseline Model Excluding interest rate	Baseline Model Excluding diff, multiple bank , interest rate	Baseline Model Excluding diff, multiple bank , interest rate	Baseline Model Excluding diff, multiple bank , interest rate	Baseline Model Excluding diff, multiple bank , interest rate, Year-Month Fixed Effects	Baseline Model Excluding diff, multiple bank , interest rate, City Fixed Effects	Baseline Model Excluding diff, multiple bank , interest rate, City Fixed Effects	Baseline Model Excluding diff, multiple bank , interest rate, City Fixed Effects
Sample	Whole Sample Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations	Dual Borrower Excluding Right Censored Observations	Dual Borrower Excluding Right Censored Observations	Dual Borrower Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations
part_loan	1.669***		1.217***			2.242***	1.617***	1.667***	1.674***
	(0.025)		(0.036)			(0.026)	(0.040)	(0.025)	(0.025)
borr_participation		0.462***							
		(0.069)							
twotype		0.739***							
		(0.037)							
parsenior				-0.208***					
				(0.015)					
consenior					0.208***				
					(0.015)				
ramadan						-0.375***			
						(0.013)			
part_loan#ramadan						0.208***			
						(0.038)			
bigcity							0.072***		
							(0.010)		
part_loan#bigcity							0.049		
							(0.034)		
more_mosque								-0.085***	
								(0.019)	
part_loan#more_mosque								-0.322***	
								(0.069)	
more_coursier									0.007
									(0.013)
part_loan#more_coursier									-0.375***
									(0.053)

Table 14. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of hypotheses –Excluding Right Censored Observations (Cont'd)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Test of Hypothesis	Hypothesis 1	Hypothesis 1	Hypothesis 2	Hypothesis 2	Hypothesis 2	Hypothesis 3	Hypothesis 3	Hypothesis 3	Hypothesis 3
Dependent Variable: Hazard Rate	Baseline Model Excluding diff, multiple bank , interest rate	Baseline Model Excluding interest rate	Baseline Model Excluding diff, multiple bank , interest rate	Baseline Model Excluding diff, multiple bank , interest rate	Baseline Model Excluding diff, multiple bank , interest rate	Baseline Model Excluding diff, multiple bank , interest rate, Year-Month Fixed Effects	Baseline Model Excluding diff, multiple bank , interest rate, City Fixed Effects	Baseline Model Excluding diff, multiple bank , interest rate, City Fixed Effects	Baseline Model Excluding diff, multiple bank , interest rate, City Fixed Effects
Sample	Whole Sample Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations	Dual Borrower Excluding Right Censored Observations	Dual Borrower Excluding Right Censored Observations	Dual Borrower Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations
Loan Characteristics:									
maturity	0.002***	0.003*	-0.002	-0.003**	-0.003**	-0.017***	0.001**	0.001*	0.001*
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
collateral	-2.040***	-1.995***	-2.135***	-2.108***	-2.108***	-2.579***	-2.044***	-2.045***	-2.044***
	(0.008)	(0.025)	(0.014)	(0.015)	(0.015)	(0.008)	(0.008)	(0.008)	(0.008)
Borrower Characteristics:									
lnsize	-0.290***	-0.367***	-0.236***	-0.247***	-0.247***	-0.354***	-0.289***	-0.289***	-0.289***
	(0.001)	(0.010)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
diff		-0.018							
		(0.028)							
multiplebank		0.157***							
		(0.025)							
Bank Characteristics:									
statebank	-0.092***	-0.110***	0.051*	0.013	0.013	-0.808***	-0.109***	-0.114***	-0.117***
	(0.014)	(0.029)	(0.030)	(0.030)	(0.030)	(0.013)	(0.014)	(0.013)	(0.013)
investmentbank	1.218***	0.273	0.983***	-0.134	-0.134	1.678***	1.171***	1.171***	1.170***
	(0.178)	(0.304)	(0.261)	(0.278)	(0.278)	(0.178)	(0.178)	(0.178)	(0.178)
foreignbank	0.251***	0.188***	0.091***	0.024	0.024	-0.395***	0.250***	0.251***	0.252***
	(0.008)	(0.024)	(0.016)	(0.016)	(0.016)	(0.008)	(0.008)	(0.008)	(0.008)
largebank	1.184***	0.346***	1.025***	0.029*	0.029*	2.032***	1.173***	1.169***	1.167***
	(0.024)	(0.042)	(0.035)	(0.015)	(0.015)	(0.024)	(0.024)	(0.024)	(0.024)
_cons	-8.603***	-7.781***	-10.637***	-9.550***	-9.758***	-4.813***	-8.594***	-8.526***	-8.527***
	(0.196)	(0.244)	(1.003)	(1.003)	(1.003)	(0.040)	(0.196)	(0.195)	(0.195)

Table 14. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of hypotheses –Excluding Right Censored Observations (Cont'd)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Test of Hypothesis	Hypothesis 1	Hypothesis 1	Hypothesis 2	Hypothesis 2	Hypothesis 2	Hypothesis 3	Hypothesis 3	Hypothesis 3	Hypothesis 3
Dependent Variable: Hazard Rate	Baseline Model Excluding diff, multiple bank , interest rate	Baseline Model Excluding interest rate	Baseline Model Excluding diff, multiple bank , interest rate	Baseline Model Excluding diff, multiple bank , interest rate	Baseline Model Excluding diff, multiple bank , interest rate	Baseline Model Excluding diff, multiple bank , interest rate, Year-Month Fixed Effects	Baseline Model Excluding diff, multiple bank , interest rate, City Fixed Effects	Baseline Model Excluding diff, multiple bank , interest rate, City Fixed Effects	Baseline Model Excluding diff, multiple bank , interest rate, City Fixed Effects
Sample	Whole Sample Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations	Dual Borrower Excluding Right Censored Observations	Dual Borrower Excluding Right Censored Observations	Dual Borrower Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations	Whole Sample Excluding Right Censored Observations
Year-Month Fixed Effect	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Financing Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Number of loan-months	9,639,645	9,639,645	3,174,304	3,088,461	3,088,461	9,639,645	9,639,645	9,639,645	9,639,645
Number of Loans	2,803,983	2,803,983	846,613	825,803	825,803	2,803,983	2,803,983	2,803,983	2,803,983
Number of borrowers		205,426							
Duration Dependence	1.15	1.16	1.18	1.21	1.21	1.28	1.15	1.15	1.15
log-likelihood	-265,872	-264,658	-69,599	-68,799	-68,799	-357,372	-266,813	-266,815	-266,817
Number of regressors	128	131	127	127	127	111	54	54	54
chi-squared	460,982***	110,540***	118,939***	115,397***	115,397***	277,984***	459,101***	459,098***	459,093***

Table reports the maximum likelihood results of parametric duration models with Weibull distribution while excluding right censored observations. Dependent variable is hazard rate in all models. Sample period is between 1:2011 to 12:2012. Models include year-month, city and financing fixed effects. Models (1) and (2) test first hypothesis for the whole sample. Models (3)(4) and (5) test the second hypothesis for dual borrowers. Models (6)(7)(8)and(9) test third hypothesis for whole sample and models include interaction terms for Ramadan, big city, more_mosque and more_coursier variables respectively. For each variable in the specification Table reports the estimated coefficient, statistical significance level and standard error (below in parentheses). In estimation of model (2), standard errors are clustered by borrower.
* p<0.1, ** p<0.05, *** p<0.01

Table 15. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypotheses –Different Default Specification (180 days overdue)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Test of Hypothesis	Hypothesis 1	Hypothesis 1	Hypothesis 1	Hypothesis 1	Hypothesis 1	Hypothesis 2	Hypothesis 2	Hypothesis 2	Hypothesis 3	Hypothesis 3	Hypothesis 3	Hypothesis 3
Dependent Variable: Hazard Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate, Multiple Bank, Diff	Baseline Model Excluding Interest Rate, Multiple Bank, Diff	Baseline Model Excluding Interest Rate, Multiple Bank, Diff	Baseline Model Excluding Interest Rate, Multiple Bank, Diff	Baseline Model Excluding Interest Rate, Multiple Bank, Diff, Year-Month Fixed Effects	Baseline Model Excluding Interest Rate, Multiple Bank, Diff, City Fixed Effects	Baseline Model Excluding Interest Rate, Multiple Bank, Diff, City Fixed Effects	Baseline Model Excluding Interest Rate, Multiple Bank, Diff, City Fixed Effects
Sample	Whole Sample	Whole Sample	Small Firm	Large Firm	Single Bank – Single Loan	Dual Borrower	Dual Borrower	Dual Borrower	Whole Sample	Whole Sample	Whole Sample	Whole Sample
part_loan	1.413***		1.157***	1.313***	0.115	0.755***			1.975***	1.631***	1.411***	1.426***
	(0.089)		(0.094)	(0.066)	(0.170)	(0.039)			(0.081)	(0.173)	(0.094)	(0.094)
borr_ participation		0.423***										
		(0.080)										
twotype		0.915***										
		(0.047)										
parsenior							-0.328***					
							(0.017)					
consenior								0.328***				
								(0.017)				
ramadan									-0.445***			
									(0.020)			
part_loan# ramadan									0.085			
									(0.061)			
bigcity										0.207***		
										(0.036)		
part_loan# bigcity										-0.239		
										(0.159)		
more_ mosque											-0.188***	
											(0.060)	
part_loan# more_ mosque											-0.043	
											(0.198)	
more_ coursier												-0.061
												(0.048)
part_loan# more_ coursier												-0.429**
												(0.168)

Table 15. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypotheses –Different Default Specification (180 days overdue) (Cont'd)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Test of Hypothesis	Hypothesis 1	Hypothesis 1	Hypothesis 1	Hypothesis 1	Hypothesis 1	Hypothesis 2	Hypothesis 2	Hypothesis 2	Hypothesis 3	Hypothesis 3	Hypothesis 3	Hypothesis 3
Dependent Variable: Hazard Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate, Multiple Bank, Diff	Baseline Model Excluding Interest Rate, Multiple Bank, Diff	Baseline Model Excluding Interest Rate, Multiple Bank, Diff	Baseline Model Excluding Interest Rate, Multiple Bank, Diff	Baseline Model Excluding Interest Rate, Multiple Bank, Diff, Year-Month Fixed Effects	Baseline Model Excluding Interest Rate, Multiple Bank, Diff, City Fixed Effects	Baseline Model Excluding Interest Rate, Multiple Bank, Diff, City Fixed Effects	Baseline Model Excluding Interest Rate, Multiple Bank, Diff, City Fixed Effects
Sample	Whole Sample	Whole Sample	Small Firm	Large Firm	Single Bank – Single Loan	Dual Borrower	Dual Borrower	Dual Borrower	Whole Sample	Whole Sample	Whole Sample	Whole Sample
maturity	-0.064***	-0.061***	-0.059***	-0.087***	-0.053***	-0.064***	-0.061***	-0.061***	-0.060***	-0.068***	-0.068***	-0.068***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
collateral	-2.581***	-2.543***	-2.027***	-3.127***	-1.806***	-2.742***	-2.749***	-2.749***	-2.630***	-2.562***	-2.562***	-2.562***
	(0.029)	(0.029)	(0.033)	(0.031)	(0.038)	(0.016)	(0.016)	(0.016)	(0.030)	(0.028)	(0.029)	(0.029)
Borrower Characteristics:												
lnsize	-0.408***	-0.460***	-0.538***	-0.196***	-0.584***	-0.300***	-0.306***	-0.306***	-0.356***	-0.350***	-0.349***	-0.350***
	(0.013)	(0.012)	(0.009)	(0.014)	(0.014)	(0.004)	(0.004)	(0.004)	(0.011)	(0.011)	(0.011)	(0.011)
diff	-0.087***	-0.006	0.103***	-0.402								
	(0.032)	(0.031)	(0.026)	(0.719)								
multiple bank	0.499***	0.346***	0.406***	-0.147								
	(0.026)	(0.031)	(0.028)	(0.123)								
Bank Characteristics:												
statebank	0.082***	0.066**	0.247***	-0.220***	0.624***	-0.061**	-0.074**	-0.074**	-0.378***	0.039	0.024	0.021
	(0.031)	(0.031)	(0.032)	(0.057)	(0.045)	(0.031)	(0.031)	(0.031)	(0.030)	(0.031)	(0.031)	(0.031)
investment bank	1.083***	0.386	-0.670	1.247***	0.080	0.892***	0.110	0.110	1.699***	1.112***	1.113***	1.110***
	(0.400)	(0.379)	(0.848)	(0.214)	(0.741)	(0.246)	(0.259)	(0.259)	(0.336)	(0.343)	(0.342)	(0.342)
foreignbank	0.279***	0.247***	0.495***	-0.452***	0.796***	-0.048**	-0.081***	-0.081***	-0.135***	0.316***	0.322***	0.322***
	(0.028)	(0.029)	(0.026)	(0.035)	(0.041)	(0.019)	(0.019)	(0.019)	(0.033)	(0.028)	(0.028)	(0.028)
largebank	0.943***	0.284***	0.989***	1.089***	0.400**	0.835***	0.164***	0.164***	1.582***	0.890***	0.877***	0.874***
	(0.079)	(0.049)	(0.084)	(0.061)	(0.163)	(0.038)	(0.016)	(0.016)	(0.071)	(0.084)	(0.084)	(0.084)
_cons	-8.019***	-7.429***	-7.616***	-25.117	-3.133***	-24.683	-24.030	-24.358	-4.527***	-8.025***	-7.829***	-7.828***
	(0.421)	(0.416)	(0.416)	(4133.220)	(0.469)	(2701.981)	(2806.459)	(2810.247)	(0.139)	(0.415)	(0.412)	(0.412)
Year-Month Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Financing Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No

Table 15. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypotheses –Different Default Specification (180 days overdue) (Cont'd)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Test of Hypothesis	Hypothesis 1	Hypothesis 1	Hypothesis 1	Hypothesis 1	Hypothesis 1	Hypothesis 2	Hypothesis 2	Hypothesis 2	Hypothesis 3	Hypothesis 3	Hypothesis 3	Hypothesis 3
Dependent Variable: Hazard Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate, Multiple Bank, Diff	Baseline Model Excluding Interest Rate, Multiple Bank, Diff	Baseline Model Excluding Interest Rate, Multiple Bank, Diff	Baseline Model Excluding Interest Rate, Multiple Bank, Diff	Baseline Model Excluding Interest Rate, Multiple Bank, Diff, Year-Month Fixed Effects	Baseline Model Excluding Interest Rate, Multiple Bank, Diff, City Fixed Effects	Baseline Model Excluding Interest Rate, Multiple Bank, Diff, City Fixed Effects	Baseline Model Excluding Interest Rate, Multiple Bank, Diff, City Fixed Effects
Sample	Whole Sample	Whole Sample	Small Firm	Large Firm	Single Bank – Single Loan	Dual Borrower	Dual Borrower	Dual Borrower	Whole Sample	Whole Sample	Whole Sample	Whole Sample
loan-months												
Number of Loans	4,469,270	4,469,270	1,223,012	1,268,043	94,266	1,252,197	1,223,177	1,223,177	4,469,270	4,469,270	4,469,270	4,469,270
Number of borrowers	335,088	335,088	298,047		94,266				335,088	335,088	335,088	335,088
Duration	1.52	1.52	1.42	2.06	1.26	1.63	1.64	1.64	1.66	1.53	1.53	1.53
Dependence log-likelihood	-244,795	-242,489	-96,133	-23,098	-14,578	-62,458	-61,172	-61,172	-287,954	-247,830	-247,953	-247,945
Number of regressors	130	131	130	130	128	128	128	128	111	54	54	54
chi-squared	68,201***	64,141***	51,841***	28,153***	24,647***	91,579***	89,749***	89,749***	39,698***	62,124***	61,979***	62,002***

Table reports the maximum likelihood results of parametric duration models with Weibull distribution while different default specification (180 days overdue). Dependent variable is hazard rate in all models. Sample period is between 1:2011 to 12:2012. Models include year-month, city, bank and financing fixed effects. Models (1) and (2) test first hypothesis for the whole sample. Models (3)(4) and (5) test the first hypothesis for small firm loans, large firm loans and loans whose borrowers borrow only one loan during sample period from a single bank respectively. Models (6), (7), (8) test second hypothesis for dual borrowers sample. Models (9)(10), (11) and (12) include interaction terms for Ramadan, big city, more_mosque and more_coursier variables for the whole sample respectively. For each variable in the specification Table reports the estimated coefficient, statistical significance level and standard error (below in parentheses). In estimations of model (1), (2), (3),(5), (10), (11) and (12) standard errors are clustered by borrower.* p<0.1, ** p<0.05, *** p<0.01

Table 16. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypotheses –Different Loan Specification (Omitted Duplicate Values)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Test of Hypothesis	Hypothesis 1	Hypothesis 1	Hypothesis 1	Hypothesis 2	Hypothesis 2	Hypothesis 2	Hypothesis 3	Hypothesis 3	Hypothesis 3	Hypothesis 3
Dependent Variable: Hazard Rate	Baseline Model	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate, Diff, Multiple Bank	Baseline Model Excluding Interest Rate, Diff, Multiple Bank	Baseline Model Excluding Interest Rate, Diff, Multiple Bank	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, Year-Month Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects
Sample :	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Dual Borrower Excluding Duplicate Values	Dual Borrower Excluding Duplicate Values	Dual Borrower Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values
part_loan	2.324***	1.262***		0.747***			1.812***	1.368***	1.242***	1.244***
	(0.076)	(0.073)		(0.048)			(0.073)	(0.139)	(0.074)	(0.074)
borr_ participation			0.233***							
			(0.079)							
twotype			0.913***							
			(0.038)							
parsenior					-0.288***					
					(0.020)					
consenior						0.288***				
						(0.020)				
ramadan							-0.071***			
							(0.018)			
part_loan# ramadan							-0.011			
							(0.060)			
bigcity								0.207***		
								(0.030)		
part_loan#big city								-0.137		
								(0.130)		
more_ mosque									-0.198***	
									(0.051)	
part_loan# more_mosque									-0.195	
									(0.193)	
more_ coursier										-0.066
										(0.041)
part_loan# more_coursier										-0.197
										(0.165)

Table 16. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypotheses –Different Loan Specification (Omitted Duplicate Values) (Cont'd)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Test of Hypothesis	Hypothesis 1	Hypothesis 1	Hypothesis 1	Hypothesis 2	Hypothesis 2	Hypothesis 2	Hypothesis 3	Hypothesis 3	Hypothesis 3	Hypothesis 3
Dependent Variable: Hazard Rate	Baseline Model	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate, Diff, Multiple Bank	Baseline Model Excluding Interest Rate, Diff, Multiple Bank	Baseline Model Excluding Interest Rate, Diff, Multiple Bank	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, Year-Month Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects
Sample :	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Dual Borrower Excluding Duplicate Values	Dual Borrower Excluding Duplicate Values	Dual Borrower Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values
Loan Characteristics:										
maturity	-0.041***	-0.059***	-0.056***	-0.079***	-0.076***	-0.076***	-0.059***	-0.064***	-0.064***	-0.064***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
collateral	-2.008***	-2.730***	-2.686***	-2.612***	-2.613***	-2.613***	-2.715***	-2.700***	-2.701***	-2.701***
	(0.031)	(0.022)	(0.022)	(0.018)	(0.019)	(0.019)	(0.021)	(0.022)	(0.022)	(0.022)
intrate	-0.164***									
	(0.004)									
Borrower Characteristics:										
lnsize	-0.179***	-0.341***	-0.394***	-0.227***	-0.233***	-0.233***	-0.295***	-0.287***	-0.286***	-0.286***
	(0.009)	(0.011)	(0.010)	(0.004)	(0.005)	(0.005)	(0.009)	(0.009)	(0.009)	(0.009)
diff	0.149***	-0.003	0.078**							
	(0.028)	(0.031)	(0.030)							
multiplebank	0.259***	0.433***	0.275***							
	(0.022)	(0.023)	(0.027)							
Bank Characteristics:										
statebank	0.628***	0.432***	0.420***	0.395***	0.394***	0.394***	0.049**	0.379***	0.367***	0.363***
	(0.025)	(0.025)	(0.025)	(0.027)	(0.027)	(0.027)	(0.024)	(0.026)	(0.026)	(0.025)
investment bank	1.164***	0.883**	0.258	0.472	-0.194	-0.194	1.473***	0.853**	0.853**	0.850**
	(0.307)	(0.399)	(0.383)	(0.337)	(0.334)	(0.334)	(0.348)	(0.341)	(0.339)	(0.339)
foreignbank	-0.367***	-0.312***	-0.334***	-0.323***	-0.345***	-0.345***	-0.556***	-0.270***	-0.263***	-0.262***
	(0.021)	(0.024)	(0.025)	(0.024)	(0.024)	(0.024)	(0.025)	(0.024)	(0.024)	(0.024)
largebank	1.693***	1.043***	0.453***	1.000***	0.310***	0.310***	1.650***	0.983***	0.970***	0.968***
	(0.063)	(0.060)	(0.044)	(0.047)	(0.019)	(0.019)	(0.061)	(0.061)	(0.061)	(0.061)
_cons	-9.352***	-7.795***	-7.217***	-23.477	-22.731	-23.018	-4.398***	-7.765***	-7.570***	-7.571***
	(0.354)	(0.359)	(0.357)	(1475.865)	(1457.414)	(1457.513)	(0.128)	(0.352)	(0.351)	(0.351)

Table 16. Results of Duration models with continuous Weibull distribution as a baseline hazard function – tests of Hypotheses –Different Loan Specification (Omitted Duplicate Values) (Cont'd)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Test of Hypothesis	Hypothesis 1	Hypothesis 1	Hypothesis 1	Hypothesis 2	Hypothesis 2	Hypothesis 2	Hypothesis 3	Hypothesis 3	Hypothesis 3	Hypothesis 3
Dependent Variable: Hazard Rate	Baseline Model	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate	Baseline Model Excluding Interest Rate, Diff, Multiple Bank	Baseline Model Excluding Interest Rate, Diff, Multiple Bank	Baseline Model Excluding Interest Rate, Diff, Multiple Bank	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, Year-Month Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects	Baseline Model Excluding Interest Rate, Diff, Multiple Bank, City Fixed Effects
Sample :	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Dual Borrower Excluding Duplicate Values	Dual Borrower Excluding Duplicate Values	Dual Borrower Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values	Whole Sample Excluding Duplicate Values
Year-Month Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Financing Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Number of loan-months	13,061,024	13,080,642	13,080,642	3,742,478	3,652,543	3,652,543	13,080,642	13,080,642	13,080,642	13,080,642
Number of Loans	2,633,388	2,637,296	2,637,296	777,425	759,136	759,136	2,637,296	2,637,296	2,637,296	2,637,296
Number of borrowers	296,787	297,557	297,557				297,557	297,557	297,557	297,557
Duration Dependence	1.72	1.77	1.76	2.22	2.23	2.23	2	1.78	1.78	1.78
log-likelihood	-145,859	-179,330	-177,427	-44,383	-43,518	-43,518	-201,963	-181,151	-181,241	-181,272
Number of regressors	130	129	130	127	127	127	111	53	53	53
chi-squared	94,701***	71,016***	66,682***	53,316***	52,396***	52,396***	48,168***	67,650***	67,780***	67,571***

Table reports the maximum likelihood results of parametric duration models with Weibull distribution while excluding duplicate observations. Dependent variable is hazard rate in all models. Sample period is between 1:2011 to 12:2012. Models include year-month, city and financing fixed effects. Models (1) , (2) and (3) test first hypothesis for the whole sample. Models (4)(5) and (6) test the second hypothesis for for dual borrowers. Models (7), (8), (9) and (10) test third hypothesis for whole sample and include interaction terms for Ramadan, big city, more_mosque and more_coursier variables respectively. For each variable in the specification Table reports the estimated coefficient, statistical significance level and standard error (below in parentheses). In estimations of model except for models (4) (5)(6)standard errors are clustered by borrower.

* p<0.1, ** p<0.05, *** p<0.01

Table 17. Results of discrete duration models with Complementary log-log models – tests of Hypotheses –							
Model	(1)	(2)	(3)	(5)	(6)	(7)	(8)
Test of Hypothesis	Hypothesis 1	Hypothesis 1	Hypothesis 2	Hypothesis 3	Hypothesis 3	Hypothesis 3	Hypothesis 3
Dependent Variable: Loan defaults certain month 1/0 (90 days overdue)	Baseline model excluding interest rate	Baseline model excluding interest rate	Baseline model excluding interest rate, Diff, Multiple Bank	Baseline Model Excluding Interest Rate, Year-Month Fixed Effects	Baseline Model Excluding Interest Rate, City Fixed Effects	Baseline Model Excluding Interest Rate, City Fixed Effects	Baseline Model Excluding Interest Rate, City Fixed Effectss
Sample	Whole Sample	Whole Sample	Dual Borrowers	Whole Sample	Whole Sample	Whole Sample	Whole Sample
part_loan	1.936***		1.239***	1.951***	1.881***	1.930***	1.936***
	(0.075)		(0.033)	(0.074)	(0.153)	(0.074)	(0.074)
borr_participation		0.625***					
		(0.075)					
twotype		1.277***					
		(0.044)					
ramadan				-0.418***			
				(0.016)			
part_loan#ramadan				0.372***			
				(0.053)			
bigcity					0.209***		
					(0.034)		
part_loan#bigcity					0.055		
					(0.146)		
more_mosque						-0.187***	
						(0.057)	
part_loan#more_mosque						-0.431*	
						(0.221)	
more_coursier							-0.050
							(0.046)
part_loan#more_coursier							-0.435**
							(0.174)
Loan Characteristics:							
maturity	-0.046***	-0.044***	-0.030***	-0.046***	-0.047***	-0.047***	-0.047***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
collateral	-2.822***	-2.794***	-3.068***	-2.843***	-2.812***	-2.812***	-2.812***
	(0.022)	(0.021)	(0.013)	(0.022)	(0.021)	(0.021)	(0.021)
Borrower Characteristics:							
lnsize	-0.616***	-0.691***	-0.421***	-0.623***	-0.617***	-0.617***	-0.617***
	(0.014)	(0.013)	(0.003)	(0.014)	(0.014)	(0.014)	(0.014)
diff	-0.129***	-0.013		-0.169***	-0.130***	-0.133***	-0.133***
	(0.030)	(0.028)		(0.029)	(0.030)	(0.030)	(0.030)
multiplebank	0.670***	0.474***		0.680***	0.684***	0.686***	0.687***
	(0.024)	(0.029)		(0.024)	(0.024)	(0.024)	(0.024)

Table 17. Results of discrete duration models with Complementary log-log models – tests of Hypotheses – (Cont'd)

Model	(1)	(2)	(3)	(5)	(6)	(7)	(8)
Test of Hypothesis	Hypothesis 1	Hypothesis 1	Hypothesis 2	Hypothesis 3	Hypothesis 3	Hypothesis 3	Hypothesis 3
Dependent Variable: Loan defaults certain month 1/0 (90 days overdue)	Baseline model excluding interest rate	Baseline model excluding interest rate	Baseline model excluding interest rate, Diff, Multiple Bank	Baseline Model Excluding Interest Rate, Year-Month Fixed Effects	Baseline Model Excluding Interest Rate, City Fixed Effects	Baseline Model Excluding Interest Rate, City Fixed Effects	Baseline Model Excluding Interest Rate, City Fixed Effectss
Sample	Whole Sample	Whole Sample	Dual Borrowers	Whole Sample	Whole Sample	Whole Sample	Whole Sample
Bank Characteristics:							
statebank	0.238***	0.214***	0.159***	0.182***	0.203***	0.191***	0.187***
	(0.027)	(0.027)	(0.023)	(0.027)	(0.027)	(0.027)	(0.027)
investmentbank	2.001***	1.030***	1.076***	1.987***	1.953***	1.950***	1.944***
	(0.249)	(0.245)	(0.245)	(0.249)	(0.250)	(0.250)	(0.249)
foreignbank	-0.006	-0.030	-0.211***	-0.146***	-0.000	0.008	0.009
	(0.030)	(0.029)	(0.016)	(0.028)	(0.030)	(0.030)	(0.030)
largebank	1.303***	0.491***	1.259***	1.355***	1.282***	1.267***	1.264***
	(0.063)	(0.044)	(0.033)	(0.062)	(0.062)	(0.062)	(0.062)
Duration Dependence:							
Log(survival time)				3.106***			
				(0.048)			
_cons	-7.754***	--7.039***	-9.751***	-11.954***	-7.847***	-7.648***	-7.645***
	(0.245)	(0.241)	(1.002)	(0.182)	(0.229)	(0.227)	(0.227)
Year-Month Fixed Effect	Yes	Yes	Yes	No	Yes	Yes	Yes
Financing Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City Fixed Effects	Yes	Yes	Yes	Yes	No	No	No
Number of loan-months	18,069,810	18,069,810	5,180,669	18,069,810	18,069,810	18,069,810	18,069,810
log-likelihood	-487,520	-491,278	-133,363	-492,262	-490,070	-490,262	-490,313
Number of borrowers	335,088	335,088		335,088	335,088	335,088	335,088
Number of regressors	129	129	129	113	55	55	55
chi-squared	86,801***	76,297***	130,841***	72,684***	82,421***	82,685***	82,423***

Table reports the maximum likelihood results discrete duration models of complementary log log regression. Dependent variable is default in a certain month (1/0) in all models. All models except for model (4) has no baseline hazard assumption. Model (4) has log time baseline hazard assumption Sample period is between 1:2011 to 12:2012. Models include year-month, city and financing fixed effects. Models (1) , (2) test first hypothesis for the whole sample. Models (3)(4) and (5) test the second hypothesis for for dual borrowers. Models (6), (7), (8) and (9) test third hypothesis for whole sample and include interaction terms for Ramadan, big city, more_mosque and more_coursier variables respectively. For each variable in the specification Table reports the estimated coefficient, statistical significance level and standard error (below in parentheses). In estimations of model standard errors are clustered by borrower.

* p<0.1, ** p<0.05, *** p<0.01

APPENDIX C: ADDITIONAL DESCRIPTIVE STATISTICS FOR THE SAMPLE

Table 18. Descriptive Sample Statistics for the Banking Sector on a Monthly Basis

	Total Loans (000 TRY)	Total Non-Performing Loans (NPL) (000 TRY)	NPL Ratio	Collateral Ratio	Weighted Maturity Month
2011m1	21,920,442	1,902	0.0001	0.8790	8.5136
2011m2	35,103,976	3,836	0.0001	1.0769	10.4242
2011m3	46,438,576	7,609	0.0002	1.0964	12.7948
2011m4	54,283,240	28,788	0.0005	0.9918	14.1990
2011m5	65,254,304	62,874	0.0010	1.1034	14.8006
2011m6	76,321,528	98,679	0.0013	1.1156	15.5006
2011m7	77,467,176	134,469	0.0017	1.1486	16.8944
2011m8	86,371,608	175,815	0.0020	1.1744	16.6502
2011m9	92,132,416	206,076	0.0022	1.1911	17.0956
2011m10	98,663,304	408,313	0.0041	1.1801	17.2580
2011m11	103,161,296	492,109	0.0048	1.1675	17.4314
2011m12	105,281,624	673,300	0.0064	1.1591	18.3434
2012m1	110,329,840	773,222	0.0070	1.0445	18.1893

Table 18. Descriptive Sample Statistics for the Banking Sector on a Monthly Basis (Cont'd)					
	Total Loans (000 TRY)	Total Non-Performing Loans (NPL) (000 TRY)	NPL Ratio	Collateral Ratio	Weighted Maturity Month
2012m2	116,407,288	858,324	0.0074	1.1193	17.8767
2012m3	118,797,424	956,114	0.0080	1.1292	18.1948
2012m4	128,527,368	1,121,386	0.0087	1.1024	17.9258
2012m5	131,887,656	1,229,680	0.0093	1.0994	18.4041
2012m6	136,438,816	1,409,253	0.0103	1.1118	18.7091
2012m7	144,657,824	1,688,156	0.0117	1.0992	18.0998
2012m8	141,964,336	1,890,669	0.0133	1.1186	18.8394
2012m9	144,636,736	2,397,296	0.0166	1.1106	18.9518
2012m10	150,711,040	2,692,896	0.0179	1.1242	18.6548
2012m11	153,682,240	2,884,435	0.0188	1.1560	19.1233
2012m12	156,680,848	3,353,141	0.0214	1.1471	19.9774
Total	120,265,807	2,035,722	0.0140	1.1229	17.8494
Number of Observations	18513694				

Table reports the recent firm loans in the sample period. NPL ratios are calculated as non performing loans (90 days overdue) divided by gross loans.

Table 19. Descriptive Sample Statistics for the Banking Sub-Sector on a Monthly Basis

	Conventional Banking					Participation Banking				
	Total Loans (000 TRY)	Total Non-Performing Loans (NPL) (000 TRY)	NPL Ratio	Collateral Ratio	Weighted Maturity Month	Total Loans (000 TRY)	Total Non-Performing Loans (NPL) (000 TRY)	NPL Ratio	Collateral Ratio	Weighted Maturity Month
2011m1	19,850,288	1,172	0.0001	0.8952	8.3623	2,070,154	730	0.0004	0.7238	9.9640
2011m2	31,163,344	3,482	0.0001	1.1161	10.3214	3,940,630	354	0.0001	0.7667	11.2364
2011m3	41,322,544	7,249	0.0002	1.1331	12.8028	5,116,035	360	0.0001	0.8005	12.7305
2011m4	48,565,488	24,772	0.0005	1.0121	14.2819	5,717,751	4,016	0.0007	0.8192	13.4949
2011m5	58,453,496	57,409	0.0010	1.1370	14.9574	6,800,805	5,465	0.0008	0.8153	13.4529
2011m6	68,544,000	78,451	0.0011	1.1495	15.6902	7,777,530	20,228	0.0026	0.8164	13.8304
2011m7	68,860,712	95,071	0.0014	1.1911	17.2337	8,606,466	39,398	0.0046	0.8081	14.1792
2011m8	77,151,152	128,098	0.0017	1.2178	16.8850	9,220,463	47,717	0.0052	0.8114	14.6855
2011m9	82,638,208	167,910	0.0020	1.2329	17.3259	9,494,211	38,166	0.0040	0.8267	15.0906
2011m10	88,429,624	353,821	0.0040	1.2219	17.5112	10,233,678	54,492	0.0053	0.8188	15.0702
2011m11	92,182,280	427,496	0.0046	1.2103	17.7239	10,979,015	64,613	0.0059	0.8083	14.9749
2011m12	93,919,152	568,649	0.0061	1.2003	18.6393	11,362,471	104,651	0.0092	0.8187	15.8976
2012m1	98,368,848	634,091	0.0064	1.0716	18.4850	11,960,999	139,131	0.0116	0.8219	15.7573
2012m2	104,374,760	695,487	0.0067	1.1534	18.0887	12,032,524	162,837	0.0135	0.8240	16.0380
2012m3	106,630,984	784,006	0.0074	1.1639	18.4212	12,166,446	172,108	0.0141	0.8254	16.2106
2012m4	115,991,184	919,579	0.0079	1.1319	18.1059	12,536,187	201,807	0.0161	0.8290	16.2589
2012m5	118,969,144	1,008,553	0.0085	1.1302	18.6652	12,918,509	221,127	0.0171	0.8150	15.9990
2012m6	123,459,176	1,189,132	0.0096	1.1438	18.9550	12,979,638	220,121	0.0170	0.8073	16.3705
2012m7	131,544,728	1,449,116	0.0110	1.1266	18.2573	13,113,097	239,040	0.0182	0.8242	16.5203
2012m8	128,320,720	1,616,199	0.0126	1.1513	19.1274	13,643,606	274,470	0.0201	0.8113	16.1303
2012m9	130,928,096	2,065,346	0.0158	1.1416	19.2074	13,708,632	331,950	0.0242	0.8144	16.5112
2012m10	136,544,784	2,342,104	0.0172	1.1569	18.8962	14,166,257	350,792	0.0248	0.8091	16.3277
2012m11	138,886,240	2,500,568	0.0180	1.1947	19.4299	14,795,992	383,867	0.0259	0.7933	16.2452
2012m12	141,960,640	2,961,830	0.0209	1.1986	20.2786	14,720,214	391,311	0.0266	0.6512	17.0734
Total	108,615,466	1,761,633	0.0133	1.1583	18.0984	11,720,576	275,187	0.0200	0.8043	15.6340
Number of Observations	16423908					2089786				

Table reports the recent firm loans in the sample period. NPL ratios are calculated as non performing loans (90 days overdue) divided by gross loans.