USING DEPOSIT INTEREST RATES IN SETTING LOAN INTEREST RATES: EVIDENCE FROM TURKEY

Önder Kaymaz, Izmir University of Economics (IUE)
Özgür Kaymaz, Turkish Airlines (THY)

ABSTRACT

Bank credit margins are set by two dynamics: loan interest rates and deposit interest rates. The latter is the leading funding cost for the commercial banks. Sampling the period running from the last financial quarter of 2002 to the last financial quarter of 2009, we consider all the listed commercial banks operating in Turkey. We obtain strong evidence of one-way causality between loan interest rates and deposit interest rates. In setting their loan interest rates, banks use deposit interest rates of the preceding period. The reverse is not true. Concurring with the literature, this causation implies that deposit interest rates explain the changes in the margin.

JEL: G21, M41.

KEYWORDS: Causality; Bank; Funding cost; Deposit interest rate; Loan interest rate; Size; Margin; Istanbul Stock Exchange.

INTRODUCTION

Kaymaz *et al.* (2010) shows that the larger the bank, the greater the bank credit margin (henceforth, referred to as margin). The reason for this was that the funding costs of the larger commercial banks (henceforth, referred to as banks) were significantly lower than those of the smaller banks. These funding costs are deposit interest rates. The authors make a further investigation to understand whether loan interest rates as the source for revenue streams also affect the degree of margin. They find that loan interest rates do not explain the changes in the margin.

Kaymaz *et al.* (ibid.) also finds that smaller banks have higher loan rates than larger banks. This linkage relies on the scholars' main implication once again, deposit interest rates. They explain this linkage saying that, as smaller banks have higher funding costs than those of their larger counterparts, they also have to set their loan prices higher. Otherwise, smaller banks will face losses in their financial statements. Therefore, Kaymaz *et al.* (ibid.) overall imply that the higher (smaller) the bank size, the lower (higher) the deposit interest rates will be.

The above-mentioned results that derive from factual information are both interesting and intuitive. As agents with major stakes in the economies, banks could be reasonably expected to set their loan prices as high as possible so as to maximize their interest revenues. The findings of Kaymaz *et al.* (ibid.), however, report that this may not always be the case.

This should not be surprising though. Indeed, we see that, in practice, after a certain point, banks cannot further rise their loan rates, due to the fear of losing (a) some of their clients, particularly the good ones with ability-to-pay and willingness-to-pay *and* to (b) the competition power in the market. This is particularly true for the larger banks. On the other hand, smaller banks do necessarily have to keep their loan prices high, and if they do not, their long-term survival will be literally at stake (Kaymaz *et al.*, unpublished a).

The above discussions indicate that banks consider their deposit interest rates in setting their loan prices. We aim to specifically document the predicted causality between bank deposit interest rates and loan

interest rates, and hence obtain a supporting evidence that deposit interest rates explain the margin changes. The remainder of this paper is hence organized as follows. The next section provides the literature. The third section prescribes the data and the empirical specification on loan interest rate-deposit interest rate causality. The fourth section presents and discusses the test results. And eventually the fifth section concludes the paper.

LITERATURE REVIEW

Prior literature concentrate rather on asymmetrical adjustment process between the borrowing (deposits) and the lending (loans) rates (e.g. Enders and Granger (1998), Enders and Siklos (2001), De Bondt *et al.* (2005), Thompson (2006), Nguyen and Islam (2009) etc.). A considerable amount of studies dates back to the seminal paper by Stiglitz and Weiss (1981). The referred scholars examine the credit rationing in the setting of imperfect information, and present a model. They argue that the credit ration happens through either contracting the number of loans banks grant or setting the interest rates higher. They also argue that in the equilibrium to ration the credits, the monetary policy may work well to impact investment level by moving the fund supply around. However, this will happen by means of credit supply rather than interest rates.

Stiglitz and Weiss suggests that imperfect information could be the cause for excess supply. More importantly, imperfect information may alone induce information asymmetries which further induce adverse selection issue. The hypothesis postulated by Stigliz and Weiss is known as consumer reaction hypothesis in the literature (Nguyen and Islam, 2009).

Schnitzel (1986) examines the causation between deposit rates and mortgage loan rates through empirical tests. He shows that loan interest rates have been affected by deposit interest rates for the period under the regulated deposit interest rate regime. Sampling the banks operating in Barbados, Greenidge and McClean (2000) investigates the effect of regulatory covenants on the bank interest rates. The sample includes a bank acting as a leader in the industry. They consider average values to proxy loan interest rates and the highestly observed time-deposit values to proxy deposit interest rates. These time deposits span three months. The scholars show that in the case of the leader bank, deposit interest rates Granger cause loan interest rates.

De Bondt *et al.* (2005) explores term structures of interest rates along with the adjustment process in the European Union (EU) Member States. They show that retail bank interest rates self-adjust to the changes in the market interest rates with both short-term and long-term specifications. But this adjustment follows rather a slow progress. The scholars conduct a Granger causality, and document the existence of the causation running from the deposit interest rates to the loan interest rates.

Conducting a panel data analysis, Gambacorta (2008) investigates the way how banks determine their interest rates. Using two lags in the model estimations, Gambacorta samples 73 cross-sections that are the banks operating across Italy. The scholar shows that the factors such as interest rate volatility, bank efficiency, credit and interest risks as well as temporary and permanent changes in income have all significant impacts on the level of bank interest rates. In other words, banks consider all these factors in pricing their interest buffers.

Nguyen and Islam (2009) investigates the asymmetric behavior related to credit margin. Considering the period from the first quarter of 1991 to the first quarter of 2007, the scholars work on the banking market in Thailand. They document that banks respond faster to the spread changes when the spread is getting larger than to the spread changes when it is getting smaller. They find the reason for the increase (decrease) in the spread as the decrease (increase) in the deposit interest rates. Banks revise their loan rates, considering the shift in the deposit rates.

Nguyen and Islam perform a Granger causality test to detect the probable causation between the loan and deposit interest rates. Unlike Thompson (2006), they find that Granger causality runs from the deposit interest rates to the loan interest rates, therefore follows a one-way direction. The scholars argue that the reason for this asymmetry is the oligopsonistic association between banks and their influential clients. These clients are rather institutional customers that are big claimants to the banks they are interacting with.

In addition to the presented relevant literature, we are also aware of an emerging research strand regarding the lending-borrowing channel: pass-through mechanism/process. A pass-through process is purported to be a shift between the economic agents that might happen in different forms and that brings up transformation. The scholars usually tend to consider this repatriation within asymmetrical context along with different time horizons.

For instance, considering Harvey (1981) and using the firm-level banking data, Gambacorta (2008) samples Italy. He shows that pass-through between the market and the bank interest rates is asymmetrical over the short-run. The degree of capitalization, relationship lending or liquidity all affect this transformation. Furthermore, Betancourt *et al.* (2008) argues that there is a pass-through running from the policy rate changes to the market interest rate changes. Building on Frexias and Rochet (1997) and sampling Colombia for the period between 1999 and 2006, the scholars develop a micro-banking model. They show that macroeconomic drivers that set the borrowing and lending conditions are influential in the degree of this pass-through.

As mentioned in the introductory paragraphs, Kaymaz *et al.* (2010) contended that banks that are larger (smaller) in size have lower deposit interest rates and therefore higher [lower] margins. They have shown that loan interest rates do not account for why larger banks gain higher margins than those of their smaller counterparts. Instead, smaller banks set such loan interest rates that are higher than those by larger banks. Kaymaz *et al.* (ibid.) is one of the early studies in the literature that explicitly shows this.

The findings presented by Kaymaz *et al.* (ibid.) raises the issue of whether banks use deposit interest rate values in pricing their loan interest rate values. Documenting the predicted causality between bank deposit interest rates and loan interest rates, we aim to contribute to the bank margin (profitability) literature. In this respect, our study is one of its firsts. The next section prescribes the data and the empirical specification on loan interest rate-deposit interest rate causality.

DATA AND SPECIFICATION

Kaymaz *et al.* (ibid.) explores the impact of size on bank credit margins. Following the literature (e.g. Brock and Suarez (2000), Kaya (2001)), they specify margin as the difference between loan interest rates and deposit interest rates. These rates are average interest values that are obtained on quarterly basis for each sampled bank. The period running from 2002 to 2009 is considered for all the banks listed in Istanbul Stock Exchange (ISE).

Building on Kaymaz *et al*. (ibid), we consider all the listed banks that are quoted on ISE (website of ISE@www.imkb.gov.tr). We employ loan interest rates and deposit interest rates that are collected from banks' disclosed independent audit reports. Banks' interest rate data before the last quarter of 2002 are not published. Therefore, we sample the period from back-in the last quarter of 2002 to the last quarter of 2009, which makes 29 financial periods overall.

The causality analysis is not achievable without using the market values of banks' interest rates. We thereby process our data through averaging the loan and the deposit interest rate values of all the listed

banks given each of the quarterly financial period. These values are presented in Table 1 on a period-by-period basis.

Table 1: Loan Interest Rates, Deposit Interest Rates (in %)

Periods	LIR	DIR
20024:1	57.38	45.69
20031:2	56.75	43.13
20032:3	48.62	37.75
20033:4	46.74	33.26
20034:5	44.95	27.16
20041:6	37.58	22.02
20042:7	34.88	21.12
20043:8	34.33	20.68
20044:9	33.24	20.13
20051:10	30.62	17.56
20052:11	28.18	16.20
20053:12	25.67	16.01
20054:13	24.07	15.85
20061:14	21.21	14.60
20062:15	22.70	14.67
20063:16	24.20	16.88
20064:17	23.18	17.71
20071:18	23.21	18.37
20072:19	23.35	17.57
20073:20	22.66	17.37
20074:21	22.10	16.60
20081:22	21.18	15.95
20082:23	21.13	16.62
20083:24	22.12	17.19
20084:25	24.12	18.55
20091:26	23.53	13.05
20092:27	21.50	12.09
20093:28	19.29	10.07
20094:29	17.54	9.30

Notes: Table 1 presents the market interest rates across the periods. The figures on the left cells are the financial periods. For instance, 20094:29 which refers to the last quarter of 2009 is the 29th period. The figures on the middle cells are loan interest rates represented by LIR. For instance, 17.54% refers to the average loan interest rate value in the market for 20094:29. The figures on the right cells are deposit interest rates represented by DIR. LIR and DIR values are in percentages. For instance, 9.30% refers to the average deposit interest rate value in the market for 20094:29. ***Source:*** *authors' own calculations using the data available at ISE.*

We perform three empirical tests. A bivariate correlation test is first made to see how, and to what extent these two margin-determining interest rates correlate to each other. Using autoregression model (VAR), Granger test is made to identify the posited causality. Two lags are included on both the interest rates. Our empirical model is hence estimated as the following:

$$LIR_t = \delta_0 + \delta_1 * LIR_{t-1} + \delta_2 * LIR_{t-2} + \psi_1 * DIR_{t-1} + \psi_2 * DIR_{t-2} + \varepsilon_t \quad (1)$$

$$DIR_t = \delta_0 + \delta_1 * DIR_{t-1} + \delta_2 * DIR_{t-2} + \psi_1 * LIR_{t-1} + \psi_2 * LIR_{t-2} + \varepsilon\varepsilon_t \quad (2)$$

where t stands for time, LIR for loan interest rates, DIR for deposit interest rates, ε_t and $\varepsilon\varepsilon_t$ for the error terms of LIR and DIR respectively.

Controlling for the cross-sectional and temporal differences, we also perform panel data analysis to see how the given interest rates statistically pertain to each other. We estimate both the fixed-effects and random-effects regression models, and show which one is the better fit for our data.

The above-mentioned empirical analyses facilitate a concurrent view on the degrees of the correlation, causation and association between the loan interest rates and deposit interest rates of the sampled banks. The next section provides and discusses the analyses results.

EMPIRICAL RESULTS & DISCUSSION

Table 2 presents the bivariate correlation test results between loan and deposit interest rates. Pearson correlation coefficient reports that loan interest rates are 95.5% correlated to deposit interest rates. This linkage is positive.

Table 2: Correlations: Loan Interest Rate─Deposit Interest Rate

		LIR	DIR
LIR	Pearson Correlation	1	.955
	Sig. (1-tailed)		.000***
	N	29	29
DIR	Pearson Correlation	.955	1
	Sig. (1-tailed)	.000***	
	N	29	29

*Notes: Table 2 presents the correlations between loan interest rate and deposit interest rate. LIR and DIR stand for loan interest rate and deposit interest rate respectively. N that refers to the number of observations is 29.*** indicates the significance at 1 percent level.*

Teasing the presented simultaneous equation (Statements 1 and 2), VAR test results are presented in Table 3, and Granger causality test results are presented in Table 4. VAR diagnostics given Table 3 show that loan interest rates positively relate to deposit interest rates.

Table 3:Vector Autoregression (VAR), Loan Interest Rate─Deposit Interest Rate

Sample: 3-29= -92.79=27 Log likelihood No. of obs

			Coef.	*Std. Err.*	*z*
LIR					
	lir	*L1.*	.432	.194	2.23
		L2.	.243	.159	1.53
	dir				
		L1	*.441*	*.192*	*2.30***
		L2	-.204	.199	-1.02
		_cons	3.228	.985	3.28
DIR					
	lir				
		L1	-.278	.196	-1.41
		L2	.222	.161	1.37
	dir				
		L1	1.207	.194	6.21
		L2	-.324	.202	-1.61
		_cons	2.768	.998	2.77

*Notes: Table 3 presents Vector Autoregression (VAR) outcomes. LIR and DIR respectively indicate loan interest rate and deposit interest rate. Number of observations is considered as 27. L1 and L2 respectively indicate first and second lags. Cons represents regression constant value. ** stands for the significance at 5 percent level.*

Amongst other results, Table 3 and 4 report that the changes in the lead values of loan interest rates are explained by the first lags of deposit interest rates at 5% significance. In particular, Table 4 clearly shows the existing causality between loan interest rates and deposit interest rates.

Table 4: Granger Causality Wald Tests, Loan Interest Rates─Deposit Interest Rates

Equation	Excluded	Chi2	df
LIR	DIR	7.51**	2
DIR	LIR	2.09	2

*Notes: Table 4 presents Granger Causality test outcomes. LIR and DIR respectively indicate loan interest rate and deposit interest rate. Number of observations is considered as 27. ** stands for the significance at 5 percent level.*

This causality is significant at 5% and its direction is one-way. We see that it is not loan rates, but deposit interest rates that Granger-cause loan interest rates. Banks use deposit interest rates of the preceding period in setting their loan interest rates in the following period. We have also performed panel data analysis to see how bank deposit interest rates relate to bank loan interest rates. The panel regression models are estimated as follows:

$LIR_{it} = \varphi_{0i} + \varphi_i * DIR_{it} + \varepsilon_{it}$ *[RE]*
$LIR_{it} = \varphi_0 + \varphi_i * DIR_{it} + \varepsilon_{it}$ *[FE]*

where RE and FE stand for the random-effects and fixed-effects panel regressions respectively. LIR stands for loan interest rates and DIR for deposit interest rates. As deposit interest rates have been shown to cause loan interest rates, we set the deposit interest rate as the explanatory variable and the loan interest rate as the dependent variable in these models. All the other notations and terms have obvious meanings. Notice that we need to have a combination of the cross-sections (group variable) and periods (time variable) to conduct panel analysis. Therefore, the data used in the panel regression tests are not the market-based, but the firm-intrinsic interest rate values that belong to each sampled bank.

Table 5 and 6 report that the models overall significantly predict the variance in the dependent variable, as shown by the values of " Prob>chi2 " in the random-effects case and of " Prob>F " in the fixed-effects case. Both of the referred significance values converge at 0. This can also be verified looking at the individual p-values (P>|z| in the random-effects case and P>|t| in the fixed-effects case) in the models approximating 0 each. The overall adjusted R^2 values in both the estimations indicate that the deposit interest rates explain the changes in the loan interest rates as much as over 65%. This signifies the relevance of the Granger causality test outcomes we have previously shown, and therefore provides a considerable degree of integrity to the very objective of this paper.

Table 5: Random-effects Panel Regression

Number of obs = 366				
Group variable: banks				
Number of groups = 13				
R-sq: within = 0.6949			Obs per group: min =	23
between = 0.1902			avg =	28.2
overall = 0.6505			max =	29
Wald chi2(1) = 796.02		Prob>chi2 = 0.000***		
lir	***Coef.***	***Std. Err.***	***z***	
dir	1.114	.0395	28.21***	
cons.	7.088	1.112	6.37***	

*Notes: Table 5 presents the random-effects outcomes. Number of observations is 366 and the number of cross-sections is 13. LIR represents loan interest rate that is the dependent variable. DIR represents deposit interest rate that is the regressor. Cons represents regression constant value.*** *stands for the significance at 1 percent level.*

As both the models yielded very similar results that are hard to distinguish from each other, we have also conducted the Hausman test to make sure which one is the case here. The test results are provided in Table 7. The p-value (Prob>chi2) suggests that we accept the alternative hypothesis postulating the

appropriacy of the fixed-effects panel regression model. In other words, the fixed-effects model is a better fit for our data. The next section concludes this paper.

Table 6: Fixed-effects (within) Panel Regression

Number of obs = 366				
Group variable: banks				
Number of groups = 13				
R-sq: within = 0.6949			Obs per group: min =	23
between = 0.1902			avg =	28.2
overall = 0.6505			max =	29
F(1,352) = 801.63		Prob>chi2 = 0.000***		
lir	***Coef.***	***Std. Err.***	***t***	
dir	.122	.0396	28.31***	
cons.	6.927	.856	8.09***	

*Notes: Table 6 presents the fixed-effects regression outcomes. Number of observations is 366 and the number of cross-sections is 13. LIR represents loan interest rate that is the dependent variable. DIR represents deposit interest rate that is the regressor. Cons represents regression constant value.*** stands for the significance at 1 percent level.*

Table 7: Hausman Test

Coefficients				
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
dir	1.122	1.114	.008	.004
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
chi2(1) = (b-B)'[(V_b-V_B)^(-1)](b-B)				
= 5.64			Prob>chi2 = 0.0176**	

*Notes: Table 7 presents Hausman test outcomes.'b' stands for the variable coefficient obtained from the fixed-effects estimation (fe). 'B' stands for the variable coefficient obtained from the random-effects estimation (re). DIR represents deposit interest rate.** stands for the significance at 5 percent level.*

CONCLUSION

Prior literature contended that banks that are larger (smaller) in size have lower deposit interest rates and therefore higher [lower] margins. Loan interest rates have been shown not to account for why larger banks gain higher margins than those of their smaller counterparts. Instead, smaller banks set such loan interest rates that are higher than those by larger banks. This raises the issue of whether banks use deposit interest rate values in pricing their loan interest rate values, which was the research objective of this paper. We aimed to contribute to the bank margin (profitability) literature through documenting the predicted causality between bank deposit interest rates and loan interest rates.

Considering all the listed banks that are quoted on ISE, we sampled the period from the last quarter of 2002 through the last quarter of 2009. Bank-specific deposit and loan interest rates were available in banks' disclosed independent audit reports over the sampling period. Through reorganizing these micro-level data, we employed quarterly-based market interest rate values.

We performed three empirical tests. A bivariate correlation test was first made to see how, and to what extent these two margin-determining interest rates correlate to each other. Pearson correlation coefficient indicated that loan interest rates are 95.5% correlated to deposit interest rates. This linkage was found to be positive and significant at 1 percent level.

Controlling for the cross-sectional and temporal differences, we performed panel data analysis to see how the given interest rates statistically pertain to each other. We estimated both the fixed-effects and random-effects regression models. We showed that the fixed-effects model is the better fit for our data. We found that the deposit interest rates robustly explain the changes in the loan interest rates as much as over 65%.

Using autoregression model (VAR), Granger test was made to identify the posited causality. Empirical documentations provide strong evidence that there is a one-way causality between deposit interest rates and loan interest rates. It is deposit interest rates from the preceding period that banks use to set loan interest rates, rather than vice versa. This causation is significant at 5 percent level, which is robust as well. Corroborating what the literature suggests, our findings hence provide further implication that deposit interest rates explain the margin changes.

This paper is not without its limitations. Due to the unavailability of the data, we could not further extend our sample window in the way to cover back the periods before the last quarter of 2002. Nonetheless, we do not think that this would significantly alter our findings since we consider quarters rather than year-ends. Employment of frequent temporal data corrected for the probable cross-sectional differences between the groups.

There is yet a plenty of work to do for the scholars. We suspected the unilateral causation between deposit interest rates and loan interest rates. The reason was that, in contrary to their peers, larger banks realize higher margins since their deposit interest rates are significantly lower. A future research may be conducted on the causation of banks' asset sizes with deposit interest rates and/or margins. As was in this study, we would expect to see a one-way causation running from asset sizes to deposit interest rates or margins in the event of the conduct of such a research.

Furthermore, a potential research may replicate our analysis, considering an economy featuring advanced capital market prospects. This replication may better comprise a wide array of territories so as to make a direct comparison between, and thereby obtain a concurrent implication about less-developed and developed countries.

With this awareness, there is a plenty of work to do for the implementers as well, including the banks alone at the foremost and the sector policy makers. Banks that are smaller in size may mobilize their funds to specific segments and thus make a difference. They can choose a particular sector to invest, build their appropriate supplier and customer networks as well as IT systems there, and specialize. After getting the know-how, smaller banks can start to grant loans to the demanding customers acting in that sector or segment. In addition to this, regulatory agents could take the necessary cautions as well as making the relevant arrangements to improve the borrowing terms of the smaller banks. These combine to alleviate the funding cost burden and promote asset growth.

REFERENCES

Betancourt, R., Vargas, H., and Rodriguez, N. (2008). Interest Rate Pass-Through in Colombia: a Micro-Banking Perspective, *Cuadernos de Economía*, Vol. 45 (Mayo), pp.29-58.

Brock, P.L., and Suarez, L.R. (2000). Understanding the behaviour of bank spreads in Latin America, *Journal of Development Economics 63*, pp.113-134.

De Bondt, G., Mojon, B., and Valla, N. (2005). Term Structure And The Sluggishness of Retail Bank Interest Rates in Euro Area Countries, ECB working paper series, No. 518, September 2005, downloadable from the URL of ECB @http://www.ecb.int, or the URL of the Social Science Research Network (SSRN) @http://ssrn.com/abstract_id=781086.

Enders, W., and Granger, C. (1998). Unit root tests and asymmetric adjustment with an example using the term structure of interest rates, *Journal of Business & Economic Statistics*, 16, pp.304-311.

Enders, W., and Siklos, P. (2001). Cointegration and threshold adjustment, *Journal of Business & Economic Statistics*, 19, pp.166-176.

Freixas X., and J.C. Rochet (1997), Microeconomics of Banking, *MIT Press*, Cambridge.

Gambacorta, L. (2008). How do banks set interest rates?, *European Economic Review*, 52, pp.792-819.

Greenidge, K., and Mcclean, W. (2000). The impact of regulatory measures on commercial bank interest rates: A micro analysis of the Barbados case, *International Advances in Economic Research*, Vol.6, No.3, August, pp.544-556.

Harvey, A.C. (1981). Time Series Models, *Allan*, Oxford, UK.
Istanbul Stock Exchange (ISE) @www.imkb.gov.tr.

Kaya, Y.T. (2001). Türk bankacılık sisteminde net faiz marjının modellenmesi (Modelling Net Interest Spread in Turkish Banking System), BDDK (BRSA: Banking Regulation and Supervision Agency), *Mali Sektör Politikaları Dairesi Çalışma Raporları (working reports)*, No.2001/4, June.

Kaymaz, Ö., Pehlivan, M., and Kaymaz, Ö. (2010). Size Does Matter: Evidence From ISE-Listed Banks, *JASSA: The Finsia Journal of Applied Finance*, forthcoming.

Kaymaz, Ö., Kaymaz, Ö., and Kılıç, S. (unpublished a). Operating Drivers Which Explain Bank Credit Margins: The Case of Turkey.

Nguyen, Chu V., and Islam, Anisul M. (2009). Asymmetries in the Thai lending-deposit rate spread: an econometric analysis, *Applied Economics Letters*, First published on: 28 August 2009 (iFirst)

Schnitzel, P. (1986). Do Deposit Rates Cause Mortgage Loan Rates?: The Evidence from Causality Tests, *Real Estate Economics*, Vol.14, Issue 3, pp.448-464.

Stiglitz, J.E., and Weiss, A. (1981). Credit Rationing in Markets with Imperfect Information, *The American Economic Review*, Vol.71, No.3. June, pp.393-410.

Thompson, M.A. (2006). Asmmetric adjustment in the prime lending–deposit rate spread, *Review of Financial Economics*, 15, pp.323-329.

BIOGRAPHY

Dr. Önder Kaymaz is an assistant professor at Izmir University of Economics. He is the corresponding author. He can be contacted at: Izmir University of Economics, Sakarya Caddesi No:156 Balçova-Izmir, Turkey. His e-mail: onder.kaymaz@ieu.edu.tr, and phone: +902324888137. Önder has several publications in the financial expertise.

Dr. Özgür Kaymaz is a supervisor at the Inspection Board Directorate at Turkish Airlines Inc (THY AO). His e-mail: okaymaz@thy.com. Being a CPA, Özgür has several publications in the financial expertise.