

## INFLUENCING FACTORS OF CURRENCY RISK OF DEPOSIT BANKS IN TURKEY BY USING PROBIT METHOD

**Serhat Yüksel** (Asst. Prof.)

Konya Food and Agriculture University

**Mustafa Özsan** (Res. Asst)

Konya Food and Agriculture University

**İsmail Canöz** (Res. Asst)

İstanbul Arel University

### Abstract

*In this paper, we aimed to analyze the factors that affect currency risk of the banks. Within this scope, annual data of 23 deposit banks for the periods between 2005 and 2015 was evaluated. In addition to this situation, panel probit model was used in order to achieve this objective. Regarding the subject of the currency risk, this model was firstly used in this study. According to the results of the analysis, it was determined that 3 independent variables affect the currency risk of deposit banks in Turkey. Firstly, it was identified that there is a positive relationship between total assets and currency risk. This situation explains that when the size of the banks increases, they tend to take more currency risk. In addition to this variable, it was also defined that there is a direct relationship between economic growth and currency risk of the banks. This result refers that in case of an increment in the market stability; banks think that the market is safer and they increase their currency risk. Moreover, it was also concluded that there is a negative relationship between interest rate and currency risk of the banks. This aspect shows that when interest rate decreases, it will lower uncertainty in the market. Thus, banks would take higher currency risk in such markets.*

**Keywords:** *Turkish Banking Sector, Deposit Banks, Currency Risk, Panel Probit*

**JEL Codes:** *F31, G21, G32,*

### 1. Introduction

Banks are the institutes which collect money from the people who have savings (Mishkin, 2007). Owing to this issue, these people have a chance to earn interest income. On the other side, they give money as a loan to the companies. Therefore, these companies can reach the fund they need to invest and to fulfill their operational needs (Dinçer et. al., 2016). Because of this situation, it can be said that banks play a significant role for the economy. Hence, the banks should provide the performance stability for the economy to improve (Zengin and Yüksel, 2016).

However, banks face different type of the risks in their operations (Hacıoğlu et. al., 2013), (Van Greuning and Brajovic-Bratanovic, 2009). The most significant risk of the banks is credit risk which means the possibility that customers cannot pay their debt to the banks (Altman and Saunders, 1998). On the other side, banks are also subject to the market risk in addition to the credit risk. The reason for this condition is that there is uncertainty in the market. In other words, some variables in the market, such as interest rate and currency risk can change very easily and it is too difficult to estimate the future value of these variables (Alexander, 2009). Because of this aspect, banks may have high amount of loss if they do not take necessary actions to hedge those risks.

Currency risk is one of the important types of market risk banks have to manage. The main reason behind this situation is that banks stated to make a lot of operations in foreign currency especially with the effect of globalization. Currency risk refers to the risk that causes loss for the banks because of the volatility in exchange rate (Shapiro, 1985). As it can be understood from this definition banks are subject to currency risks when there is a difference between foreign exchange assets and liabilities. If these foreign exchange assets of the banks are higher

than the liabilities, banks will have loss when foreign currency depreciates. On the other hand, in case of higher foreign exchange liabilities than the assets, banks will get loss when there is a foreign currency appreciation.

Owing to the expressions emphasized above, currency risk is essential for the banks. Because of this condition, this risk should be managed effectively by the banks. Within this context, first of all, currency risk should be measured appropriately (Dinçer and Hacıoğlu, 2015). There are mainly two different types of measurement models of the currency risk which are standard method and value at risk method. In addition to this situation, Banking Regulatory and Supervisory Agency (BRSA) gives very much importance to currency risk that it wants Turkish banks to calculate and report currency risk daily. As a result of this analysis, if banks have currency risk which is higher than expected level, BRSA can control this risk more effectively.

While considering the issues emphasized above, it can be said that studies related to the risks of the banks are essential. Parallel to this aspect, in this study, we aim to identify the indicators of the currency risk for Turkish banks. Within this scope, we used the annual data for the period between 2005 and 2015. Additionally, panel probit model was used so as to achieve this objective. As a result of the analysis, it will be possible to understand the influencing factors of the currency risk in Turkish banking sector. Owing to this objective, this study will be useful to make necessary recommendation in order to minimize the currency risk.

The paper is organized as follows: after introduction part, we give information about the similar studies in the literature. Moreover, the third part explains research and application to determine the important factors of currency risk in banking sector. In this part, we identify the data, methodology and details of panel probit analysis. Finally, the results of the analysis are given in the conclusion part.

## 2. Literature Review

There are many studies in the literature that aimed to analyze the determinants of currency risk. Some of them were detailed on table 1.

**Table 1. Studies Related to the Currency Risk**

Authors	Method	Scope	Result
Shapiro (1985)	Regression	US	Inflation is the main indicator of the currency risk.
Levich and Thomas (1993)	Regression	US	Derivatives are useful products to decrease currency risk.
De Santis and Gerard (1998)	GARCH	US	Stock exchange index is an important indicator of currency risk.
Carlson and Osler (1999)	Survey	US	Interest rate affects the size of currency risk.
Günay (2001)	GARCH	Turkey	It was analyzed that there is a relationship between interest rate and currency risk.
De Roon et. al. (2003)	Regression	G5 Countries	It was identified that futures and options are significant tools to hedge currency risk.
Yıldırım (2003)	Augmented Dickey Fuller Test	Turkey	It showed that there is not any relationship between purchasing power parity and currency risk in the long run.
Lustig and Verdelhan (2005)	Regression	US	It was concluded that interest rate affects currency risk.
Ayvaz (2006)	Granger Causality Analysis	Turkey	It was defined that volatility in İstanbul Stock Exchange index causes currency risk.
Lustig and Verdelhan (2007)	Regression	Japan	They determined that large return volatility influences currency risk.
Çiçek and Öztürk	MGARCH	Turkey	Change in international reserve amount is an indicator of

Authors	Method	Scope	Result
(2007)			currency risk.
Zanbak (2008)	Regression	Turkey	They reached a conclusion that stock return and sector growth rate affect currency risk.
Demir (2009)	Logit	Turkey	It was concluded that volatility in the market affects currency risk.
Schiozer and Saito (2009)	Regression	Argentina, Brazil, Chile, and Mexico	Derivatives are important tools so as to hedge currency risk.
Sever (2009)	GARCH	Turkey	Currency risk is affected by export negatively and by import positively.
Doğukanlı et. al. (2010)	Johansen Cointegration Test	Turkey	It was concluded that volatility in the economy increases currency risk.
Lustig and Roussanov (2011)	Regression	US	It was determined that interest rate influences currency risk.
Berke (2012)	FMOLS, CCR and DOLS	Turkey	It was determined that there is a relationship between BIST 100 index and currency risk.
Ordu (2013)	Granger Causality Analysis	Turkey	It was defined that export and import are important determinants of currency risk.
Kia (2013)	Regression	Canada	It was found that there is not a significant relationship between interest rate and currency risk.
Özkan and Erden (2015)	DCC-GARCH	78 different countries	It was identified that inflation rate influences currency risk.
Tetik and Kanat (2016)	GARCH	Turkey	It was concluded that volatility in the market affects currency risk.
Başarır and Keten (2016)	Granger Causality Analysis	Developing Countries	There is no causality relationship between CDS amount and currency risk.
Gervais et. al. (2016)	VECM	Canada	They reached a conclusion that current account deficit increases currency risk.
Mohapatra and Rath (2016)	Regression	India	It was determined that export amount and the size of the companies are the most significant factors of currency risk.
Eichler and Rövekamp (2016)	Regression	23 Emerging Markets	It was identified that macroeconomic factors are more effective on currency risk rather than internal factors of the company.
Rodriguez (2016)	Panel Probit	20 Latin American Countries	It was concluded that macroeconomic factors influence currency risk.
Ahmad et. al. (2016)	Granger Causality Analysis	Asian Countries	It was defined that export amount and economic growth rate are important factors of currency risk.
Anzuini et. al. (2016)	VAR	Euro area	GDP growth rate and interest rate influence currency risk.

There is plentiful literature about the factors which affect currency risk. While some studies would agree with the others according to the results, some would disagree. This situation shows the importance of making a country-based analysis. In particular, interest rate is one of the common variables used in many studies about currency risk. Carlson and Osler (1999) used survey method to analyze the effect of interest rate on currency risk. According to their

results, it was stated that interest rate determines the size of currency risk in United States. While Lustig and Verdelhan (2005) and Lustig and Roussanov (2011) agreed with the result that interest rate has an effect on currency risk through their US scoped regression analysis, Kia (2013) came up with another result suggesting that there is not a significant effect of interest rate on currency risk by using the same method for another country, Canada. In addition to these studies, Anzuini et. al. (2016) and Günay (2001) found a significant impact of interest rate on currency risk.

Moreover, international trade represents a core variable which determines currency risk. Using GARCH method for Turkey, Sever (2009) showed that currency risk was affected by imports and exports. Similar to study, Ordu (2013) also indicated the importance of imports and exports in order to determine the currency risk by using Granger Causality Analysis for Turkey. Likewise, using regression analysis for India, Mohapatra and Rath (2016) found that export amounts and size of companies are significant determinants of currency risk. Ahmad et. al. (2016) supported these results for Asian Countries. They found that the amount of exports and growth rate are important factors determining currency risk.

On the other hand, derivatives and stock exchange indexes are important factors that influence the currency risk. Levich and Thomas (1993) and Schiozer and Saito (2009) found that derivatives are important tools to reduce currency risk by using regression analysis. De Santis and Gerard (1998) and Berke (2012) found that stock exchange indexes have an important effect on currency risk. Additionally, Ayyaz (2006) stated that the volatility in BIST index causes currency risk. While De Roon et. al. (2003) represents the importance of using futures and options to reduce the currency risk, Zambak (2008) found the impact of stock return and sector growth rate on currency risk. On the contrary, Başarır and Keten (2016) found that there is no significant relationship between CDS amount and currency risk.

Last but not least, there are macroeconomic variables that affect the currency risk. Saphiro (1985) used regression analysis to measure the effect of inflation on currency risk in US. According to the results of this study, inflation is the main determinant of currency risk. However, Özkan and Erden (2015) found contradictory results. They found that inflation rate increases currency risk by using DCC-GARCH method for 78 different countries. Yıldırım (2003) used Augmented Dickey-Fuller test to analyze the possible effects of purchasing power parity on currency risk. Results showed that there is no effect of purchasing power parity on currency risk. Using MGARCH analysis, Çiçek and Öztürk (2007) concluded that variation of international reserve amount has an impact on currency risk in Turkey. Gervais et. al. (2016) found that current account deficit increases currency risk using VECM analysis for Canada. Rodriguez (2016) used panel probit method for 20 Latin American countries and stated that macroeconomic factors had impact on currency risk. Furthermore, Eichler and Rövekamp (2016) found that macroeconomic factors were more important variables to determine currency risk for companies than internal factors by using regression analysis for 23 emerging markets.

### **3. Research and Application**

#### **3.1. Data**

In this study, we used annual data for the periods between 2005 and 2015. This data of internal variables was provided from Turkish Banking Association. On the other side, the data of external variables was obtained from the website of World Bank. In addition to that, we used EViews 8.0 and SPSS 22 programs to make the analysis. There are 27 deposit banks in Turkey. However, because Bank of Tokyo-Mitsubishi UFJ Turkey, Odea Bank and Rabobank have been newly established and Adabank is not an active deposit bank in Turkey due to the legal problems with its owners, we removed these banks from the analysis. Therefore, in this study, we used the data of 23 deposit banks. The details of these banks were given in table 2.

**Table 2. List of Banks Analyzed in this Study**

Bank Name	Asset Size (% of deposit banks) in 2015	Asset Size (% of total banks) in 2015
Türkiye Cumhuriyeti Ziraat Bankası A.Ş.	14.23	13.54
Türkiye İş Bankası A.Ş.	12.95	12.33
Türkiye Garanti Bankası A.Ş.	11.95	11.37
Akbank T.A.Ş.	11.03	10.50
Yapı ve Kredi Bankası A.Ş.	10.35	9.86
Türkiye Halk Bankası A.Ş.	8.82	8.40
Türkiye Vakıflar Bankası T.A.O.	8.59	8.18
Finans Bank A.Ş.	4.03	3.83
Denizbank A.Ş.	3.96	3.77
Türk Ekonomi Bankası A.Ş.	3.38	3.22
ING Bank A.Ş.	2.31	2.20
HSBC Bank A.Ş.	1.49	1.42
Şekerbank T.A.Ş.	1.15	1.09
Alternatifbank A.Ş.	0.62	0.59
Fibabanka A.Ş.	0.53	0.50
Anadolubank A.Ş.	0.52	0.49
Burgan Bank A.Ş.	0.50	0.48
Citibank A.Ş.	0.39	0.37
ICBC Turkey Bank A.Ş.	0.31	0.30
Turkland Bank A.Ş.	0.27	0.26
Arap Türk Bankası A.Ş.	0.19	0.18
Deutsche Bank A.Ş.	0.14	0.13
Turkish Bank A.Ş.	0.06	0.05
<b>Total</b>	<b>97.76</b>	<b>93.07</b>

Source: Turkish Banking Association

### 3.2. Panel Probit Model

Three different models can be used for the conditions in which dependent variable takes two different values, such as “0” and “1”. The names of these models are linear probability method, probit and logit (Yüksel et. al., 2015). With respect to the linear probability model, the values that are greater than “1” are accepted as “1”. On the other hand, when the values of the dependent variables are less than “0”, they are considered as “0”. As it can be seen from this expression, linear probability method has some disadvantages because this assumption does not reflect the reality effectively.

In order to solve this problem, probit and logit models were developed. The main difference between probit model and logit model is that probit model uses normal cumulative distribution function whereas logit model uses logistic distribution function. By using normal distribution function, the values of the dependent variable can be between “0” and “1” in probit analysis (Gujarati, 1988). The prerequisite of probit model is that variables should be stationary. So as to satisfy this requirement, Augmented Dickey Fuller unit root test was used. The equation of this test is given below.

$$\Delta Y_t = \alpha + \gamma Y_{t-1} + \sum_{k=1}^n \beta_k \Delta Y_{t-k} + \varepsilon_t$$

In the equation above, " $\Delta Y_t$ " means the first difference of the series. In this analysis, the value of " $\gamma$ " is significant. If this value is equal to "0", this means that there is not a unit root in the equation which means that the variable is stationary (Granger, 1969). Esquivel and Larrain (1998) tried to determine the early warning signals of the financial crisis occurred in 30 different countries by using probit method. Additionally, Frankel and Rose (1996) made a similar study in 105 countries with the help of this method. Furthermore, Oktar and Dalyancı (2010) analyzed Turkish financial crises after 1990 and Oktar and Yüksel (2015) examined Russian crisis in 1998 by using probit model.

### 3.3. Variables Used in this Study

With respect to the currency risk, we used the ratio of "(net open FX position + net off-balance sheet position)/total capital". So as to calculate the value of the dependent variable, firstly we compared the absolute value of each bank's ratio with the absolute value of the sector average. If the bank's ratio is greater than the sector average, then it will take the value of "1", but in other cases, it will be "0". In other words, the value of "1" refers to the situation of higher currency risk whereas dependent variable will be "0" when banks have lower currency risk. Additionally, in order to analyze the influencing factors of currency risk in Turkish banks, we decided to use 10 different independent variables. 4 of them are internal explanatory variables and 6 are external variables. The details of these variables were given in table 3.

**Table 3. Independent Variables Used in the Study**

Type of the Variables	Independent Variables	References
Internal	ROE	Demir (2009), Lustig and Verdelhan (2007)
	Total Assets	Demir (2009), Mohapatra and Rath (2016), Lustig and Verdelhan (2007)
	Total Loans/Total Deposits	Demir (2009), Lustig and Verdelhan (2007)
	Derivatives/Total Loans	Başarır and Keten (2016), Mohapatra and Rath (2016), Ahmad et. al. (2016), Schiozer and Saito (2009), Levich and Thomas (1993), De Roon et. al. (2003)
External	Economic Growth	Demir (2009), Zambak (2008), Kia (2013), Eichler and Rövekamp (2016), Rodriguez (2016), Ahmad et. al. (2016), Anzuini et. al. (2016)
	Inflation Rate	Özkan and Erden (2015), Eichler and Rövekamp (2016), Rodriguez (2016), Shapiro (1985)
	Interest rate	Günay (2001), Kia (2013), Eichler and Rövekamp (2016), Rodriguez (2016), Anzuini et. al. (2016), Lustig and Roussanov (2011), Carlson and Osler (1999), Lustig and Verdelhan (2005)
	BIST1 100 index	Ayvaz (2006), Berke (2012), Demir (2009), Zambak (2008), Doğukanlı et. al. (2010), Çiçek and Öztürk (2007), De Santis and Gerard (1998), Lustig and Roussanov (2011)
	Current Account Deficit/GDP	Ordu (2013), Gervais et. al. (2016), Başarır and Keten (2016), Kia (2013), Sever (2009), Eichler and Rövekamp (2016), Rodriguez (2016)
	Reserves	Çiçek and Öztürk (2007)

Return on equity refers to the ratio of net profit to total equity amount. As it can be seen from the definition, it is a ratio that shows the probability performance of the banks (Arditti, 1967). Therefore, it is expected that the banks

<sup>1</sup> (BIST), Borsa Istanbul, formerly known as Istanbul Stock Exchange Market.

which have higher profit can take higher amount of currency risk. As a consequence of their competitive power, banks, which have higher performance, may take higher amount of currency risk. This situation is also valid for the total assets variable which shows the size of the banks. In addition to these variables, the ratio of total loans to total deposits shows the level of the risk banks take. Owing to this situation, there should be positive relationship between this ratio and currency risk. The last internal variable of this study is derivatives. These are the products that can be used in order to hedge currency risk. Thus, there should be a negative relationship between currency risk and the amount of derivatives.

In addition to the internal variables, we used 6 external variables that may affect the currency risk of the banks. Economic growth is a significant indicator of economic stability in the country. As a result of this condition, it is expected to have positive relationship between economic growth and currency risk. Due to the same reason, current account deficit amount and inflation rate are expected to decrease currency risk. Moreover, because higher interest rate leads to increase the volatility in the market, there should be negative relationship between this variable and currency risk (Devereux, 1997). Finally, when international reserve amount of a country is high, banks in that country can take higher currency risk.

### 3.4. Results of the Model

In order to understand the indicators of currency risk, first of all, Augmented Dickey Fuller unit root test was performed. The details of this test were given on table 4.

**Table 4. Unit Root Test Results**

Variables	Level Value (Probability)	First Difference Value (Probability)
Return on Equity	0.0006	-
Total Assets	1.0000	0.0027
Total Loans / Total Deposits	0.9990	0.0106
Derivatives	0.8099	0.0010
Economic Growth	0.0002	-
Inflation Rate	0.0000	-
Interest Rate	1.0000	0.0002
BIST 100 Index	0.0000	-
Current Account Deficit	0.0285	-
Reserves	0.8613	0.0035

As it can be seen from table 4, 5 explanatory variables (Return on Equity, Economic Growth, Inflation Rate, BIST 100 Index, and Current Account Deficit) are stationary on their level values. On the other side, it was also identified that 5 independent variables (Total Assets, Total Loans / Total Deposits, Derivatives, Interest Rate and Reserves) are not stationary because their probability levels are more than 0.05. Therefore, we used the first difference of these variables on the analysis. After that, panel probit analysis was performed by using EViews 8 program. The results of this analysis were shown in table 5.

**Table 5. Panel Probit Test Results**

Variables	Coefficient	Probability
Return on Equity	0.007	0.471
Total Assets	0.001	0.075
Total Loans / Total Deposits	-0.304	0.798
Derivatives	-0.005	0.639
Economic Growth	0.124	0.001
Interest Rate	-0.239	0.000
Reserves	0.001	0.891
Nagelkerke R-squared: 0.228		

Table 5 shows the panel probit analysis result. Due to the multicollinearity problem, we had to eliminate the variables of “inflation rate”, “BIST 100 Index” and “Current Account Deficit” from the analysis. As it can be seen from table 5, the probability values of 3 explanatory variables are less than 0.1. This situation shows that these 3 variables are statistically significant. Because the coefficient of total assets is positive (0.001), it can be understood that there is a direct relationship between this variable and currency risk of the banks. That is to say, Turkish banks, which have higher size, take more currency risk in comparison with other banks.

Another significant explanatory variable of this study is economic growth. Since its coefficient is positive (0.124), it was defined that there is a direct relationship between economic growth and currency risk of the banks. In other words, when economic growth goes up, currency risk amount of Turkish banks rises as well. The main reason behind this condition is that economic growth increases stability of the economy. Owing to this aspect, because banks think that the market is safe, so they increase their currency risk in order to make more profit. On the other hand, it was determined that there is an inverse relationship between interest rate and currency risk of the banks due to the negative coefficient of this variable (-0.239). This situation shows that lower interest rate leads banks to take higher currency risk. In other words, because decreasing interest rate shows the stability in the economy, uncertainty in the market goes down for the banks. As a result of this situation, banks can take higher currency risk.

#### 4. Conclusion

In this study, we tried to determine the influencing factors of currency risk of the deposit banks in Turkey. Within this context, we analyzed 23 deposit banks in Turkey. On the other side, Bank of Tokyo-Mitsubishi UFJ Turkey, Odea Bank, Rabobank and Adabank had to be eliminated since the data for these banks cannot be obtained. In addition to this situation, annual data for the periods between 2005 and 2015 was evaluated in this study. Furthermore, analysis was performed by using panel probit approach.

In the first stage of the analysis, we made unit root test to the explanatory variables in order to understand whether they are stationary or not. In order to achieve this objective, Augmented Dickey Fuller unit root test was performed. As a result of this analysis, it was identified that 5 explanatory variables (Return on Equity, Economic Growth, Inflation Rate, BIST 100 Index, and Current Account Deficit) are stationary on their level values. On the contrary, it was also seen that 5 other independent variables (Total Assets, Total Loans / Total Deposits, Derivatives, Interest Rate and Reserves) are not stationary because their probability levels are more than 0.05. Because of this situation, the first differences of these variables were used in the analysis.

After making unit root test, panel probit test was performed. According to the results of this analysis, it was determined that 3 independent variables influence the currency risk of Turkish deposit banks. First of all, it was concluded that there is a direct relationship between the amount of total assets and the currency risk of the banks because the coefficient of this variable is positive. This issue refers to the situation that when the size of the banks increases, they tend to have more currency risk in comparison with other banks.

Another conclusion from this result of this analysis is that there is a positive relationship between economic growth and currency risk of the banks. In other words, it was defined that currency risk amount of Turkish banks goes up when there is an economic growth. This condition shows that when economy is growing, market will be assumed as safe by the banks. Hence, they can increase the currency risk so as to achieve their profitability. Furthermore, it was also identified that lower interest rate causes banks to take higher currency risk. The main reason behind this situation is that uncertainty in the market will be reduced when there is a decrease in interest rate.

This study determined the influencing factors of the banks to take currency risk. These results may be directive for regulatory authority to control banks not to take higher currency risk. In other words, it was recommended that Banking Regulatory and Supervisory Agency should consider the banks, which have higher size, regarding currency risk because they tend to take more risk according to the results of this study. In addition to this aspect, the conditions in which there is high economic growth and lower interest rate should also be taken into the consideration since banks are willing to take higher currency risk when the market is stable. Furthermore, some additional researches can be performed by including lots of countries in order to much detailed results.

## References

- Ahmad, F., Draz, M. U., & Yang, S. C. (2016). Exchange Rate, Economic Growth and Foreign Direct Investment in Emerging Asian Economies: Fresh Evidence from Long Run Estimation and Variance Decomposition Approach. *Economic Growth and Foreign Direct Investment in Emerging Asian Economies: Fresh Evidence from Long Run Estimation and Variance Decomposition Approach (June 6, 2016)*.
- Alexander, C. (2009). *Market Risk Analysis, Value at Risk Models* (Vol. 4). John Wiley & Sons.
- Altman, E. I., & Saunders, A. (1998). Credit risk measurement: Developments over the last 20 years. *Journal of Banking and Finance*, 21(11/12).
- Anzuini, A., Cecioni, M., & Neri, S. (2016). Determinants of the movements in the euro-dollar exchange rate during the sovereign debt crisis. *Bank of Italy Occasional Paper*, Available at SSRN: 305.
- Arditti, F. D. (1967). Risk and the required return on equity. *The Journal of Finance*, 22(1), 19-36.
- Ayvaz, Ö. (2006). Döviz Kuru ve Hisse Senetleri Fiyatları Arasındaki Nedensellik İlişkisi. *İktisadi ve İdari Bilimler Fakültesi Dergisi*, 8(2), 1-14.
- Başarır, Ç., & Keten, M. (2016). Gelişmekte Olan Ülkelerin Cds Primleri İle Hisse Senetleri Ve Döviz Kurları Arasındaki Kointegrasyon İlişkisi A Cointegration Analysis Between Cds Premiums, Stock Indexes And Exchange Rates In Emerging Countries. *Mehmet Akif Ersoy Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 8(15), 369-380.
- Berke, B. (2012). Döviz Kuru ve İMKB100 Endeksi İlişkisi: Yeni Bir Test. *Maliye Dergisi*, 163, 243-257.
- Carlson, J. A., & Osler, C. L. (1999). Determinants of currency risk premiums. *FRB of New York Staff Report*, (70).
- Çiçek, M., & Öztürk, F. (2007). Yabancı Hisse Senedi Yatırımcıları Türkiye’de Döviz Kuru Volatilitelerini Şiddetlendiriyor Mu?. *Ankara Üniversitesi SBF Dergisi*, 62(04), 83-107.
- Demir, S. (2009). Döviz Riskinden Korunma Yöntemleri ve Kullanılma Nedenleri: İMKB Örneği. *Muhasebe ve Finansman Dergisi*, 41, 156-170.
- De Roon, F. A., Nijman, T. E., & Werker, B. J. (2003). Currency hedging for international stock portfolios: The usefulness of mean–variance analysis. *Journal of Banking & Finance*, 27(2), 327-349.
- De Santis, G., & Gerard, B. (1998). How big is the premium for currency risk?. *Journal of Financial Economics*, 49(3), 375-412.
- Devereux, M. B. (1997). Real exchange rates and macroeconomics: evidence and theory. *Canadian Journal of Economics*, 773-808.
- Dincer, H., & Hacıoglu, U. (2015). A Comparative Performance Evaluation on Bipolar Risks in Emerging Capital Markets Using Fuzzy AHP-TOPSIS and VIKOR Approaches. *Engineering Economics*, 26(2), 118-129.
- Dincer, H., Hacıoglu, U., & Yuksel, S. (2016). Balanced Scorecard-based Performance Assessment of Turkish Banking Sector with Analytic Network Process. *International Journal of Decision Sciences & Applications-IJDSA*, 1(1), 1-21.
- Doğukanlı, H., Özmen, M., & Yücel, E. (2010). İMKB’de Sektörel Açından Döviz Kuru Duyarlılığının incelenmesi. *Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 19(3), 63-86.
- Eichler, S., & Rövekamp, I. (2016). A market-based indicator of currency risk: Evidence from American Depositary Receipts. *Available at SSRN 2738025*.
- Esquivel, G., & Larrain, F. (1998). Explaining currency crises. *John F. Kennedy Faculty Research WP Series R98-07*.
- Frankel, J. A., & Rose, A. K. (1996). Currency crashes in emerging markets: An empirical treatment. *Journal of international Economics*, 41(3), 351-366.

- Gervais, O., Schembri, L., & Suchanek, L. (2016). Current account dynamics, real exchange rate adjustment, and the exchange rate regime in emerging-market economies. *Journal of Development Economics*, 119, 86-99.
- Granger, C. W. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica: Journal of the Econometric Society*, 424-438.
- Gujarati, D. (1988). *Basic Econometrics*. McGraw Hill International Edition.
- Günay, A. (2001). *Exchange rate risk and interest rate: a case study for Turkey* (Doctoral dissertation, Bilkent University).
- Hacıoğlu, U., Dincer, H., & Celik, I. (2016). The Volatile Effect of Conflict Risk on Foreign Investment. *International Journal of Research in Business and Social Science (2147-4478)*, 2(1), 57-66.
- Kia, A. (2013). Determinants of the real exchange rate in a small open economy: Evidence from Canada. *Journal of International Financial Markets, Institutions and Money*, 23, 163-178.
- Levich, R. M., & Thomas, L. R. (1993). The merits of active currency risk management: evidence from international bond portfolios. *Financial Analysts Journal*, 49(5), 63-70.
- Lustig, H., Roussanov, N., & Verdelhan, A. (2011). Common risk factors in currency markets. *Review of Financial Studies*, 24(11), 3731-3777.
- Lustig, H., & Verdelhan, A. (2005). *The cross-section of currency risk premia and US consumption growth risk* (No. w11104). National Bureau of Economic Research
- Lustig, H., & Verdelhan, A. (2007). The cross section of foreign currency risk premia and consumption growth risk. *The American economic review*, 97(1), 89-117.
- Mishkin, F. S. (2007). *The economics of money, banking, and financial markets*. Pearson education.
- Mohapatra, S. M., & Rath, B. N. (2016). Exchange Rate Exposure and its Determinants: Evidence from Indian Firms. *The International Trade Journal*, 1-15.
- Oktar, S., & Dalyancı, L. (2010). Finansal Kriz Teorileri ve Türkiye Ekonomisinde 1990 Sonrası Finansal Krizler. *İktisadi ve İdari Bilimler Dergisi*, 29(2), 1-22.
- Oktar, S., & Yüksel, S. (2015). 1998 Yılında Rusya'da Yaşanan Bankacılık Krizi ve Öncü Göstergeleri. *İktisadi ve İdari Bilimler Dergisi*, 37(2), 327-340.
- Ordu, C. F. (2013). Döviz kuru dış ticaret ilişkisi: Türkiye örneği. Adnan Menderes Üniversitesi Sosyal Bilimler Enstitüsü Yüksek Lisans Tezi.
- Özkan, I., & Erden, L. (2015). Time-varying nature and macroeconomic determinants of exchange rate pass-through. *International Review of Economics & Finance*, 38, 56-66.
- Rodriguez, C. M. (2016). Economic and political determinants of exchange rate regimes: The case of Latin America. *International Economics*, 147, 1-26.
- Schiozer, R. F., & Saito, R. (2009). The determinants of currency risk management in Latin American nonfinancial firms. *Emerging Markets Finance and Trade*, 45(1), 49-71
- Sever, E. (2009). Reel Döviz Kuru Belirsizliğinin Ticaret Performansına Etkisi: Türkiye Uygulaması. *Girişimcilik ve Kalkınma Dergisi*, 4(2), 77-97.
- Shapiro, A. C. (1985). Currency risk and country risk in international banking. *The Journal of Finance*, 40(3), 881-891
- Tetik, N., & Kanat, E. (2016). Döviz Kuru Riskinin Ölçülmesinde Garch Yönteminin Uygulanması. *Sosyal ve Beşeri Bilimler Araştırmaları Dergisi*, 122.
- Yıldırım, O. Döviz Kurları Çerçevesinde Satın Alma Gücü Paritesinin Zaman Serisi Analizi ve Türkiye Ekonomisi Uygulaması, *Bankacılar Dergisi*, sayı 44, 2003.
- Van Greuning, H., & Brajovic-Bratanovic, S. (2009). *Analyzing banking risk: a framework for assessing corporate governance and risk management*. World Bank Publications.

- Yüksel, S., Dincer, H., & Hacıoğlu, U. (2015). CAMELS-based Determinants for the Credit Rating of Turkish Deposit Banks. *International Journal of Finance & Banking Studies*, 4(4), 1-17.
- Zanbak, M. (2008). Döviz kuru riski analizi: Türkiye üzerine ampirik bir inceleme (Master Thesis, Akdeniz University).
- Zengin, S., & Yüksel, S. (2016). Likidite riskini etkileyen faktörler: Türk bankacılık sektörü üzerine bir inceleme. *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, 15(29), 77-95.