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The impact of participation banks on macroeconomic indicators in Turkey

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Abstract. Demand for participation banks and participation banking instruments in Turkey is increasing its importance day by day. Along with the increase in interest for theinterest-free financial instruments in international financial markets after the second half of the 20th century, demand for interest-free financial instruments in Turkey over the past two decades has increased as well. However, the share of the Participation Banks in the financial system of Turkey's economy is already only 5 %, which indicates that sufficient financial depth has not been achieved in this respect. From this point of view,in this study development of participation banking in Turkey and in the world and impacts of the funds extended by participation banks on real macroeconomic indicators (exports, gross domestic product, employment, household consumption expenditures and investments) are analyzed with the panel data analysis methodusing unbalanced panelquarterly data covering periods between 2010- 2017. The results of the analyses have shown that although its share in the financial system is below the expected level, funds extended by participation banks affect the indicators related to foreign trade, employment, supply and demand side of Turkey's economy positively.

Keywords. Participation banks, Macroeconomics indicators, Panel analysis, Heteroscedasticity, Autocorrelation.

JEL. B22, C50, E50.

1. Introduction

Financial globalization and the increased financial depth brought by financial globalization have pushed the financial sector into new quests in the last century. While the current financial system is inadequate to meet the needs of all the nations in the world, there may arise problems in transferring the existing capital stock to investments due to socio-economic and religious restrictions. This encouraged financial system actors to produce new solutions in the last half of the 20th century and at the beginning of the 21st century to include resources that are not transferred to the sector into the financial cycle.

In the last period, increasing capital stock in the Gulf and middle-eastern countries has attracted the financial sector, which is in search of resources, and lead

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the sector to new quests to include the existing capital in these countries into the system. In this context, the need to develop a system in accordance with the beliefs and the needs of these societies has emerged to be able to incorporate the savings of the countries in the Gulf and the Middle East, almost all of whom are Muslim.

All these quests brought the participation banking with the common name Islamic Banking (interest-free banking) into question. In the modern sense, the participation banks, which gave the first example in 1963 with My Ghamr Savings Bank that was established in Egypt, have gained a growing structure throughout the world in the last fifty years. The growing need for new financial instruments in the Gulf states, where oil and capital accumulation has increased, increasing demand for Islamic financial instruments and the fact that Islamic Finance has also became demanded in countries with fewer Muslim populations such as the US and Europe gradually increased the importance given to the participation banking.

The increasing importance of Islamic finance accompanied the interest of financial actors in our country and the sector, the legal infrastructure of which was completed in 1983started commercial activities under the title of the first interest-free banks private finance institutions in 1985. In 1999, private finance establishments, which were taken into the scope of banking law, took their places in the financial sector in our country as new banks with new legislation in 2005.

When increasing importance of participation banking and the literature related to the participation banking working with interest- free banking model is analyzed, it is seen that there are also studies conducted in order to explain the differences between conventional (traditional) banking and participation banking, as well as verbal / theoretical studies based on the functioning of participation banking. On the other hand, we can talk about the existence of studies, a great majority of which is theoretical, and which examines the Islamic banking system.

In addition to empirical studies on the effectiveness of the Islamic banking system, some researchers - even in a limited number – made the comparison of the profitability and efficiency level of the conventional banking system and Islamic banking. Pursuant to productivity analyses made by evaluating methods of fund collecting, credits extended and interest mentality criteria, studies including participation banking funds' contribution to real economy has been encountered in literature.

Due to the limited number of empirical studies on participation banking in the literature, this study focuses on empirical side of participation banking. In this study we investigate the impacts of the funds extended by participation banks on real macroeconomic indicators by utilizing unbalanced panel quarterly data covering periods of 2010- 2017. The estimation results of the analyses have revealed that funds extended by participation banks positively affect the macroeconomic indicators related to foreign trade, employment, supply and demand side of Turkey's economy.

The second part of the study provides brief literature review, data and methodology is in third part, estimation results are reported and discussed in fourth section, and finally the last section concludes.

2. Brief literature review

When empirical studies in the literature are examined, it is seen that performance analyzes related to the effectiveness of Islamic banking are included and apart from that it has been observed that comparison studies based on comparison with conventional banks have been made in some studies. On the other hand, we can also talk about the presence of studies parallel to ours in the literature an alyzing the impact of the macroeconomic indicators on profitability analysis in the banking sector and on the credits for the funds extended. You can encounter a few studies analyzing the impact of the participation banking, namely Islamic banking in the literature, on macroeconomic indicators at the empirical level. In this context some researches that discuss arguments about functioning of

participation banking- Islamic banking- at the empirical level and that is taken advantage of in this study are as follows:

Bashir (2001); analyzed the risk and profitability of two Islamic banking operations in Sudan using the OLS method. The study involving the estimation of the profitability of the total assets held by Islamic banking holders was partially supported by the empirical results in the theoretical implication that total assets grew, and profitability increased. In this context, that the relationship between size and profitability measures is statistically significant and the magnitude of equity is negatively related to risk are the findings of the research.

Arslan & Yapraklı (2008); used total bank loans and inflation (PPI) variable to determine the relationship between inflation and bank lending in terms of Turkey in the period between 1983-2007. As a result of the analysis made by using Johansen cointegration analysis and error correction model, it was estimated that bank loans positively affected the inflation in the long term. On the other hand, Inflation negatively affects bank loans. Granger tests show that there is a causality relationship between variables.

Furqani & Mulyany (2009); in his study, the relationship between Islamic banking and economic growth was tested with data of three months in the 1997-2005 period. In the case of Malaysia; Islamic bank financing, GDP per capita, fixed investments and trade activities were used as time series data for representing the real sector. Based on the results of the analysis using the unit root, Johansen cointegration, Granger causality and vector error correction models, it was concluded that Islamic banking affected fixed investments bilaterally in the long-term. Moreover, the relationship between Islamic banking and GDP supports the "demand-driven hypothesis".

Yazdan & Sadr (2012); examined the short-term and long-term relationship between the development of Islamic banking and economic growth in Iran and Indonesia with the quartile data in the period between 2000 and 2010. According to the results obtained by applying the ARDL bound testing, financing of short-term Islamic banking was found to be bilaterally related to economic growth (GDP).The results usually show that the financing of Islamic banking is positive in the long term and that it is significantly related to economic growth and capital accumulation of the countries in question.

Abduh & Chowdhury (2012); aimed to investigate the long-term and dynamic relationship between the development of Islamic banking and economic growth in Bangladesh in his study. In the study in which three-month time series data between 2004 and 2011 are used; co-integration and Granger's causality approach have led to the conclusion that Islamic banking financing has a positive and meaningful relationship to economic growth both short and long term. By this means, the study suggests the implementation of development policies for Islamic banking.

Al-Oqool, *et. al.,* (2014); studied the relationship between the financial development of Islamic banking and economic growth over the Jordanian example in the period between 1980 and 2012. According to the result of the research using time series data of Jordan's total financing of Islamic banking, deposits and gross domestic product (GDP), the existence of two-way and long-term Granger causality between GDP and the financial development of Islamic banking has been estimated.

Tabash & Dhankar (2014); have discussed the relationship between the development of Islamic financing and economic growth in the Middle East. The researcher using the United Arab Emirates (BAE), Bahrain and Qatar examples for this, analyzed 1990-2008 time series for Bahrain and Qatar; and 1990-2010 time series for the BAE with the unit root, Johansen cointegration and Granger causality tests. According to the results of the analysis, there is a positive relationship has been found between the financing of Islamic banking in the countries concerned and economic growth. On the other hand, In Qatar and Bahrain, on the other hand,

there is a bilateral relationship between the financing of Islamic banking and economic growth.

On the other hand, in Qatar and Bahrain examples, there is a bilateral relationship between Islamic banking financing and economic growth. And in the BAE example, completing Schumpeter's supply- side theory, there is a relationship between the financing of Islamic banking and economic growth in a one-way -from Islamic banking to economic growth.

Echchabi & Azouzi (2015); analyzed the relationship between Islamic banking development and economic growth through cointegration and Granger causality tests in the United Arab Emirates (BAE) example using the data of 2004-2011 quarter. The results of the study's analysis indicate that there is no relationship between the development of Islamic banking and economic growth in the BAE.

3. Data and methodology

This study empirically examines possible impacts of the credits extended by participation banks in Turkey on real macroeconomic indicators using unbalanced quarterly panel data of 2010:1-2017:1.

Multiple regression equation for fixed effect models used in analyses is as follows:

$$y_{it} = \beta_{0i} + \beta_1 \text{LOGCREDIT}_{it} + \beta' Z_{it} + u_{it} \tag{1}$$

Multiple regression equation for random effect models used in analyses is as follows:

$$y_{it} = \beta_0 + \beta_1 \text{LOGCREDIT}_{it} + \beta' Z_{it} + \varepsilon_i + u_{it} \tag{2}$$

it in equation nnsre presents observation value of the relevant variable in question for the ith participation bank at t time; β' is the transpose of the parameter vector of the control variables; Z_{it} represents the matrix related to other control variables (these control variables; LOGCREDIT, INT2, LOGINDP, LOGEXPGS1, LOGGOODS2); β_{0i} represent participation bank-specific factors that have not been taken into account in a certain way in a model that does not differ for a particular time while differentiating in terms of participation bank; and ε_i represents participation bank specific random factors. u_{it} is the error term of the regression model. Variables, their definitions and their resources are reported in Table 1.

Table 1. *Variables List*

Variables	Definition	Resource
LOGCREDIT	Logarithmic transformation of credits extended by participation banks	Union of Participating Banks
LOGGOODS2	Logarithmic transformation of product import value (in US $)	IMF
INT2	Interest rate	IMF
LOGINDP	Logarithmic transformation of industrial production index	IMF
LOGEXPGS1	Logarithmic transformation of export of goods and services at current prices (million euro)	Eurostat
LOGGDP1	Logarithmic transformation of GDP by income method	Central Bank
LOGGFCF	Logarithmic transformation of gross fixed capital formation (million TL)	IMF
LOGEMP	Logarithmic transformation of the number of employed people	IMF
LOGHCE	Logarithmic transformation of household consumption expenditures (million TL) (nominal)	IMF

Credit amount extended by participating banks (LOGCREDIT) is expected to have a positive effect on export (LOGEXPGS1), employment (LOGEMP), household consumption (LOGHCE), national income (LOGGDP1) and investments (LOGGFCF).

The choice between fixed effect and random effect models was made according to the Hausman test statistic with %5 significance level. In the event that probability value of the Hausman test statistic proves to be statistically significant only the fixed effect model is reported, while the random effect model is reported when it doesn't come up with statistically significant results.

Modified Wald test and Engle (ARCH) tests are used to determine whether there is heteroscedasticity problem in the models or not. Modified Bhargava, Baltagi-Wu, Wooldridge tests are used to determine whether there is auto-correlation problemin the models or not. Corected forms of the models in which heteroscedasticity and/or autocorrelation problems are identified are reported in the next column.

4. Estimation results

Estimation results for each macroeconomic indicator are reported under five subheadings.

4.1. Impact of the credits extended by participation banks on national income

The fact that the *P-value = 0.0147* of the Hausman statistic obtained for the model with the dependent variable of national income in Table 2 means that the fixed effect model is the appropriate model. And for this reason, the estimation results of the multiple regression model related to the random effect model have been reported.

Table 2. *Results of the Model in which National Income is the Dependent Variable*

	Uncorrected model		Corrected model	
	Coefficient	P-value	Coefficient	P-value
LOGCREDIT	0.1386	0.0000	0.2106	0.0000
INT2	-0.0215	0.0000	-0.0097	0.0440
LOGINDP	0.9486	0.0000	0.4575	0.0000
LOGEXPGS1	0.5569	0.0000	0.7287	0.0000
Constant	19.0160	0.0000	18.2110	0.0000
Number of the observations	108		104	
Number of the banks	4		4	
R-squared	0.9516		0.7570	
HausmanSta.	12.3800	0.0147		
Modified Wald Test Sta.	0.2600	0.9925		
Engle (ARCH) Test Sta.	0.4939	0.4822		
Modified Bhargava Test Sta.	1.1976			
Baltagi-Wu LBI Test Sta.	1.2846			
Wooldridge Test Sta.	740.3810	0.0001		

Uncorrected form of multivariate fixed effect model is checked throughheteroscedasticityand autocorrelation tests. The fact that probability values of Wald test and Engle (ARCH) test statistics are not statistically significant shows that there is no heteroscedasticity problem in the model.

All the autocorrelation test results in the table imply that there is an autocorrelation problem in the model. Corrected model taking into consideration autocorrelation problem was estimated and its robust coefficients are reported in the corrected model column.

The coefficient of the LOGCREDIT variable is positive and statistically significant according to the results of the corrected model. According to this result, credits extended by participation banks affect national income in adjuvant sense. The coefficient obtained for interest rates (INT2), which is indicator of the economic uncertainty, is negative and statistically significant. In other words, as the economic uncertainty increase, national income decrease. The coefficients obtained for LOGINDP and LOGEXPGS1 are positive and statistically significant. Industrial production and increase in export lead to increase in national income.

4.2. Impact of the credits extended by participation banks on export

The fact that the *P-value = 0. 6540* of the Hausman statistic obtained for the model with the dependent variable of export in Table 3 means that the random effect model is the appropriate model. And for this reason, the prediction results of the multiple regression model related to the random effect model have been reported.

Table 3. *Results of the Model in which Export is the Dependent Variable*

	Uncorrected model		Corrected model	
	Coefficient	P-value	Coefficient	P-value
LOGCREDIT	0,0669	0.0180	0.1182	0.0010
LOGGOODS2	0.1397	0.0470	0.1835	0.0540
INT2	-0.0007	0.8570	-0.0048	0.3660
LOGINDP	1.2593	0.0000	0.7947	0.0000
Constant	0.9598	0.0090	2.8917	0.0020
Number of the observations	108		108	
Number of the banks	4		4	
R-squared	0.7825		0.7753	
Hausman Sta.	2.4500	0.6540		
Engle (ARCH) Test Sta.	0.0033	0.9540		
Modified Bhargava Test Sta.	1.4169			
Baltagi-Wu LBI Test Sta.	1.4829			
Wooldridge Test Sta.	572.0520	0.0002		

The fact that the probability value of the test statistic is not statistically significant for Engle (ARCH) test in the table shows that there is no heteroscedasticity problem in the model.

According to the autocorrelation test results in the table, there is an autocorrelation problem in the model. Corrected model taking into consideration autocorrelation problem was estimated and its robust coefficients are reported in the corrected model column.

The coefficient of the LOGCREDIT variable is positive and statistically significant according to the results of the corrected model. According to this result, credits extended by participation banks increase exports. The coefficient obtained for interest rates (INT2), which is indicator of the economic uncertainty, takes a negative sign parallel to expectations but is not statistically significant. The coefficients obtained for LOGINDP and LOGGOODS2 are positive and statistically significant. In other words, industrial production and import affect export in adjuvant sense. Within the fact that Turkey has been experiencing import-led growth for the last 10-15 years, increasing impact of import on export is an expected result.

4.3. Impact of the credits extended by participation banks on investments

The fact that the *P-value = 0.1100* of the Hausman statistic obtained for the model with the dependent variable of investments in Table 4means that the random effect model is the appropriate model. And for this reason, the prediction results of the multiple regression model related to the random effect model have been reported.

Table 4. *Results of the Model in which Investments is Dependent Variable*

	Uncorrected model		Corrected model	
	Coefficient	P-value	Coefficient	P-value
LOGCREDIT	0.0734	0.0010	0.1287	0.0000
INT2	-0.0228	0.0000	-0.0189	0.0000
LOGINDP	2.1918	0.0000	1.8564	0.0000
LOGEXPGS1	0.4545	0.0000	0.5177	0.0000
Constant	-4.4160	0.0000	-4.4415	0.0000
Number of the observations	102		102	
Number of the banks	4		4	
R-squared	0.9692		0.9690	
HausmanSta.	7.5400	0.1100		

Engle (ARCH) Test Sta.	0.8339	0.3611
Modified Bhargava Test Sta.	1.4217	
Baltagi-Wu LBI Test Sta.	1.8479	
Wooldridge Test Sta.	200.4330	0.0008

The fact that the probability value of the test statistic is not statistically significant in the table for Engle (ARCH) test implies that there is no heteroscedasticity problem in the model.

All the autocorrelation test results in the table hints that the model has autocorrelation problem. Corrected model taking into consideration autocorrelation problem was estimated and its robust coefficients are reported in the corrected model column.

The coefficient of the LOGCREDIT variable is positive and statistically significant according to the results of the corrected model. This result shows that credits extended by participation banks affect the investments positively. The coefficient obtained for interest rates (INT2), which is indicator of the economic uncertainty and of the investment funding costs, are negatively and statistically significant. In other words, as the economic uncertainty and investment funding costs increase, the investments decrease. The coefficients obtained for LOGINDP and LOGEXPGS1 are positive and statistically significant. Industrial production and increase in export lead to increase in investments.

4.4. Impact of the credits extended by participation banks on employment

The fact that the *P-value = 0,4433* of the Hausman statistic obtained for the model with the dependent variable of employment in Table 5 means that the random effect model is the appropriate model. And for this reason, the prediction results of the multiple regression model related to the random effect model have been reported.

Table 5. *Results of the Model in which Employment is Dependent Variable*

	Uncorrected model		Corrected model	
	Coefficient	P-value	Coefficient	P-value
LOGCREDIT	0.0153	0.0410	0.0176	0.0940
INT2	-0.0037	0.0010	-0.0043	0.0030
LOGINDP	0.1870	0.0010	0.1245	0.0050
LOGEXPGS1	0.2119	0.0000	0.2472	0.0000
Constant	13.6834	0.0000	13.5784	0.0000
Number of the observations	102		102	
Number of the banks	4		4	
R-squared	0.9049		0.9039	
HausmanSta.	3.7300	0.4433		
Engle (ARCH) Test Sta.	1.0725	0.3004		
Modified Bhargava Test Sta.	0.9944			
Baltagi-Wu LBI Test Sta.	1.3363			
Wooldridge Test Sta.	212.0100	0.0007		

The fact that the probability value of the test statistic is not statistically significant in table for Engle (ARCH) test implies that there is no heteroscedasticity problem in the model.

All the autocorrelation test results in the table indicate that the model has autocorrelation problem. Corrected model taking into consideration autocorrelation problem was estimated and its robust coefficients are reported in the corrected model column.

The coefficient of the LOGCREDIT variable is positive and statistically significant according to the results of the corrected model. This result shows that credits extended by participation banks lead to increase in employment. The coefficient obtained for interest rates (INT2), which is indicator of the economic uncertainty is negative and is statistically significant. On the other hand, the coefficients obtained for LOGINDP and LOGEXPGS1 are positive and statistically

significant. It implies that industrial production and export affect the employment positively.

4.5. Impact of the credits extended by participation banks on household consumption expenditures

The fact that the *P-value = 0.0073* of the Hausman statistic obtained for the model with the dependent variable of household consumption expenditures in Table 6 means that the fixed effect model is the appropriate model. And for this reason, the prediction results of the multiple regression model related to the fixed effect model have been reported.

Table 6. *Results of the Model in which Household Consumption Expenditures is Dependent Variable*

	Uncorrected model		Corrected Model	
	Coefficient	P-value	Coefficient	P-value
LOGCREDIT	0.1609	0.0000	0.1609	0.0610
INT2	-0.0179	0.0000	-0.0179	0.0220
LOGINDP	1.5243	0.0000	1.5243	0.0000
LOGEXPGS1	0.0010	0.9880	0.0010	0.9930
Constant	2.8437	0.0000	2.8437	0.0000
Number of the observations	102		102	
Number of the banks	4		4	
R-squared	0.9303		0.9303	
HausmanSta.	14.0000	0.0073		
Modified Wald Test Sta.	4.5100	0.3413		
Engle (ARCH) Test Sta.	3.9166	0.0478		
Modified Bhargava Test Sta.	1.6414			
Baltagi-Wu LBI Test Sta.	1.9117			
Wooldridge Test Sta.	41.2190	0.0077		

As both the Wald test statistic and Engle (ARCH) test statistic are not statistically significant at the significance level of %1, it is concluded that there is no heteroscedasticity problem in the model.

All the autocorrelation test results in the table shows that the model has autocorrelation problem. Corrected model taking into consideration autocorrelation problem was estimated and its robust coefficients are reported in the corrected model column.

The coefficient of the LOGCREDIT variable is positive and statistically significant according to the results of the corrected model. This result shows that credits extended by participation banks affect household consumption expenditures in adjuvant sense. The coefficient obtained for interest rates (INT2), which is indicator of the economic uncertainty is negative and is statistically significant. In other words, as the economic uncertainty increase, the household consumption expenditures decrease. The coefficient obtained for LOGINDP is positive and statistically significant. Industrial production affects the household consumption expenditures positively. The coefficient obtained for LOGEXPGS1 is statistically insignificant.

5. Conclusion

It is seen that the participation banks' share in the Turkish banking sector in terms of both the number of branches and the credits granted by them has been increasing day by day. This increase in the shares of the participation banks is expected to have impacts on macroeconomic indicators. In this context, possible impacts of the credits extended by participation banks in Turkey on real macroeconomic indicators are empirically analyzed by using unbalanced quarterly panel data for periods of 2010:1-2017:1.

According to the estimation results, it is seen that increases in the credits extended by participation banks affect national income, exports, investment, employment and household consumption expenditures positively.

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