European Journal of Economic and Financial Research
ISSN: 2501-9430
ISSN-L: 2501-9430
Available on-line at: http://www.oapub.org/soc

doi: 10.5281/zenodo.3711624 Volume 3 | Issue 6 | 2020

PARTICIPATORY BANKS AND THEIR SYNERGIES EFFECTS ON THEIR CONVENTIONAL COUNTERPARTS IN TURKEY'S MIXED BANKING SYSTEM

Zouhair El Azzouzi[i]
Abd Elmalek Esaadi University,
Faculty of Economics Social
and Legal Sciences of Tetuan,
Morocco

Abstract:
In recent decades, participatory banks have been growing all over the world, with unusual growth rates, as is the case in the Turkish Republic where there is a mixed banking system that accepts such banks with their conventional counterparts. However, our study focuses on the synergies that participatory banks can achieve on their conventional counterparts in the Turkish banking system. However, to address our present research problem, we have adopted an empirical study which is based initially on the econometric test of the unit root, which aims to verify the stationary nature of the study variables, including, the funds raised and the funds allocated, using the 10th version of the software Eviews. This, in order to move to linear regression between the independent variables representing the participating banks and the dependent ones represented by the conventional banks, and this on the software SPSS21. Indeed, all the observations are in million Turkish Pound and they were collected by the official website of the Turkish Participatory Banks Association covering the period between December 2011 and July 2018, that is, 80 observations. The results found showed us that participatory banks partially achieve synergies effects on conventional banks in Turkey's mixed banking system. Moreover, these effects can be explained by the ethical principles on which the participatory banks are based and the competitive pressures between them and their conventional counterparts.

JEL: E50; G21; G24

Keywords: mixed banking system, participatory bank, conventional bank, synergistic effect, Turkey

[i] Correspondence: email mohammedzouhair0@gmail.com

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1. Introduction

Our present study focuses on the case of Turkey's mixed banking system where participating banks co-exist with conventional banks. However, our research aims to determine whether these so-called participatory banks are achieving synergy effects on conventional banks. However, we formulate our problem as follows : effectively achieve synergies effects on their conventional counterparts in the Turkish mixed banking system? To this end, the main question of our current research work is: Are Turkish participatory banks achieving synergistic effects on their conventional counterparts? So, the questions derived from our present paper are: Are the funds raised by participating banks positively correlated with those of conventional banks in the Turkish mixed banking system? Are the allocated funds of participating banks positively correlated with those of conventional banks in Turkey? Admittedly, empirical analysis of the synergy effects of participatory banks on conventional banks in the Turkish mixed banking system requires variables representing the development of participatory and conventional banks.

This includes the effect of funds raised and allocated from participating banks on those of conventional banks, since funds allocated (FA) represent the volume of funds granted to clients of participating banks (PFF) and those of conventional banks (FCC), so we will try to test whether the allocated funds of participating banks are achieving synergy effects on the allocated funds of conventional banks. Thus, for funds raised (FC), which are funds raised by the various instruments of participating banks (FCP) and those that are specific to conventional banks (FCC).

Therefore, we will show whether the funds raised from participating banks are achieving synergy effects on the funds raised from conventional banks. On the basis of these variables, we will begin our empirical study with a unit root test, allowing to know if they are stationary, based on the most used tests at this level that are (ADF, PP and KPSS). Then we will move on to the simple linear regression, using the 21st version of the software SPSS, whose data covers the period between December 2011 and July 2018, 80 observations and that they are in millions of the Turkish Lira, and were collected on the official website of the association of Turkish participating banks.

The results found showed us that the regression between each independent variable and other dependent is highly significant. Therefore, we were able to confirm our main hypothesis of research, by saying that participatory banks partially achieve synergistic effects on conventional banks in the mixed banking system of the Turkish Republic.

Furthermore, the synergy effects achieved by Turkish participatory banks on their conventional counterparts, can be explained first by the ethical principles of participatory finance including mainly the prohibition of interest and the sharing of losses and profits. And secondly, by the competitive pressures between the two types of banks, as well as certain orientations and behaviours that promote the development of the two types of banks in particular, and the banking system, or rather economic development in general.

2. Literature Review

The careful reading of several research works by some authors dealing with different issues in participatory finance, and particularly in the area of participatory banks, has allowed us to write the following literature review :

In 2010, Bengul Gulumser Arslan and Etem Hakan Ergec studied the efficiency of 26 conventional banks and four participatory banks between 2006 and 2009, using the data wrapping analysis method (DEA), their results show that although three out of ten participating banks identified inefficient practices in 2006, 2009 and only one out of 11 banks identified as inefficient, it was also a participatory bank. In 2012, Fatih Macit examined the specific and macro-economic determinants of profitability of participatory banks in Turkey's mixed banking system, based on two different profitability indicators, namely: ROA and ROE found that in terms of specific determinants of bank profitability, the ratio of non-performance of funds allocated to total loans and the log of real assets are largely significant, since the first ratio has a negative impact on profitability and the second has a positive impact on the profitability of participating banks. The ROE on total assets is largely significant for both indicators, but it has different effects on ROA and ROE. In terms of the macroeconomic determinants of profitability, the exchange rate and the real interest rate are significant, so they can have a positive impact on profitability in participatory banks. Pejman Abedifar studied the impact of participatory banks on the economic development of some Muslim countries with hybrid banking systems during the period 1999-2009. It was based on the ratio of bank deposits to GDP represented by bank deposits, the ratio of private loans to GDP represented by private loans, and the credits allocated to the government sector, the annual growth rate represents economic development. The author finds that there is a positive relationship between participatory banks and economic development in some countries with mixed banking systems.

Ahmet and Huseyin Ozturk, examined the loan models in the mixed banking system of the Turkish Republic. They found that conventional banks and participating banks exhibit a pro-cyclical lending model. They also found that the allocated funds of participating banks do not differ significantly from the allocated funds of conventional banks, highlighting the regulatory changes of the last decade that have been effective on participatory banks, as they could encourage these banks to lend pro-cyclically. To test this conjecture, the authors empirically examined how the state of competition in the Turkish banking system affects bank credit through economic cycles, managing the effects separately for participatory and conventional banks. The results suggest that the degree of competition stimulates the pro-cyclical lending bank to the same extent, confirming the convergence between participatory and conventional banks in lending models. However, on the basis of this literature review, it appears that most of the previous work confirms that there is a significant relationship between the development of the banking sector and economic growth in general, and between participatory financial institutions and economic development in particular, in several developed and developing countries.

3. Material and Methods

To succeed in research work, one needs to be methodical but, to follow a methodology to validate a knowledge brought by his research, assumes in our case a validation of a research model that involves the validation of each of the relationships between the study variables.

For this reason, empirical analysis of the synergy effects of participatory banks on conventional banks in the Turkish mixed banking system, requires variables representing the development of participatory and conventional banks. These include the effect of funds allocated and raised from participating banks on those of Turkish conventional banks. However, based on these variables, we will begin our empirical study with a unit root test, allowing to know all the observations are not stationary in level and integrated in the same order, based on the most commonly used tests at this level (ADF, PP and KPSS).

Then we will move to the simple linear regression (RLS), using the 21st version of the software SPSS, whose all data are in million Turkish pounds (TL) covering the same period from December 2011 to July 2018, representing 80 observations, which were collected on the official website of the Association of Turkish Participating Banks.

4. Results and Discussion

In order to properly present the results of our current research work, we will start with the statistical description of the data, then we will move on to the results of the stationary tests (ADF, PP and KPSS), by finalising by linear regression. We begin our results first with the graphical presentation of the data, to get a general idea of their developments during the period concerned, in order to describe them statistically. The two graphs below show the evolution of the two study variables at the level of participating and conventional banks during the period between December 2011 and July 2018.

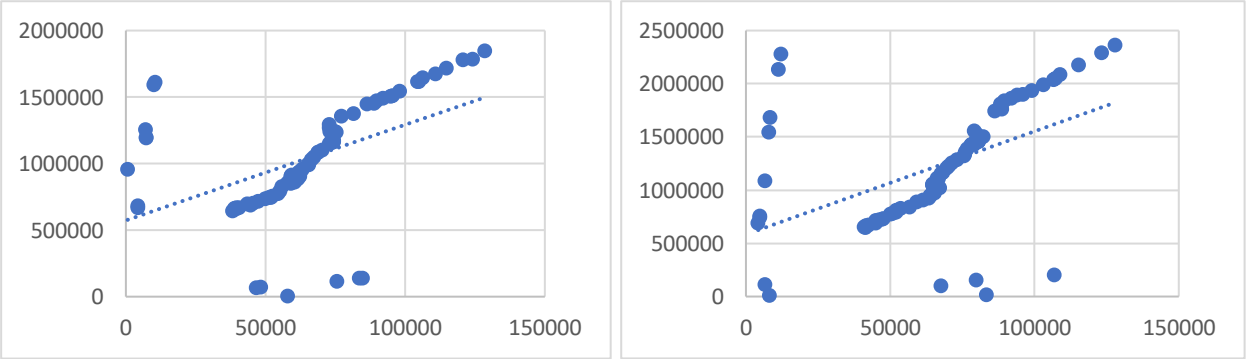

Figure 1: Temporal evolution of funds allocated and raised from Turkish participating and conventional banks (Source: Author's calculation by using MS Excel)

From these two figures it can be seen that there is an increasing linear correlation between the funds raised and the allocated funds of the participating banks and those of

the conventional Turkish banks. Therefore, we find that the independent and dependent variables of our study are linearly correlated with each other. The following table presents the descriptive statistics of the study variables in million Turkish lira (TL) :

Table 1: Descriptive statistics on study variables in million TL

Descriptive statistics	Funds raised from participating banks	Funds raised from conventional banks	Allocated funds from participating banks	Funds allocated from conventional banks
Mean	70.60870	1105.872	74.31434	1326.048
Median	67.91750	1067.788	74.43250	1307.081
Max	128.4050	1852.156	127.8970	2363.928
Min	38.14800	646.3290	41.09600	648.8810
Standard deviation	21.36974	334.4576	20.89501	476.2190
Asymmetry	0.728209	0.436604	0.487858	0.365503
Flattening	3.066514	2.097793	2.851224	2.091699
Observations	80	80	80	80

Source: Author's calculation by using Eviews v10.

According to this table, the funds raised by conventional banks are on average much higher than the funds raised by participating banks of which: (Average: 1105.87 > 70.60870) they are also more volatile (Standard deviation: 334.4576 > 21.36974). Thus, the distribution of the set of the two series is asymmetric to right (Skewness: 0.72/ 0.43), they are also more flattened than normal (Kurtosis: 3.06/ 2.09).

We also note that the allocated funds of conventional banks are on average much higher than the allocated funds of participating banks (Average: 1326.048 > 74.31434), moreover, they are more volatile (Standard deviation: 476.2190 > 20.89501). The distribution of the two series is asymmetric on the right (Skewness: 0.48, 0.36), they are flatter than normal (Kurtosis: 2.85 and 2.09).

Before starting a linear regression, it is important to conduct an analysis of the stationary nature of the data, which is a prerequisite for any econometric analysis, especially when it comes to financial data. In our case, our observations are banking data that are not constant over time, so we must test the stationary nature of the two variables in our study, using the ADF, PP and KPSS tests. Indeed, the tests of the unit root of the variable representing the funds collected from the Turkish participating banks are summarized in the following table :

Table 2: Results of stable funds raised by participating banks

	Second difference							
	ADF			PP			KPSS	
	Statistic	Critical val	p-value	Statistic	Critical val	p-value	Statistic	Critical val
Model 1	-12.25474	-3.517847	0.0001	-24.55566	-3.517847	0.0001	0.180900	0.739000
Model 2	-12.18401	-4.081666	0.0001	-32.46528	-4.081666	0.0001	0.179230	0.216000
Model 3	-12.31865	-2.595340	0.0000	-21.63004	-2.595340	0.0000	-	-

Source: Author's calculation by using Eviews v10.

According to the KPSS test, this variable is stationary in level, but the other tests (ADF and PP) showed the opposite. The second difference is that the three tests have significant results of stationarity. However, the statistical and critical values, as well as the p-values of the unit root test of the variable "Funds collected from conventional banks" are the following :

Table 3: Results of stable funds raised by conventional banks

	Second difference							
	ADF			PP			KPSS	
	Statistic	Critical val	p-value	Statistic	Critical val	p-value	Statistic	Critical val
Model 1	-7.859097	-3.521579	0.0000	-72.76194	-3.517847	0.0001	0.500000	0.739000
Model 2	-7.825268	-4.086877	0.0000	-90.27570	-4.081666	0.0001	0.150000	0.216000
Model 3	-7.844150	-2.596586	0.0000	-48.18126	-2.595340	0.0000	-	-

Source: Author's calculation by using Eviews 10.

According to this table, we find that this variable is not stationary in level and this is confirmed by the three tests, first difference only the PP test which showed that the latter is stationary but second difference, the two ADF and PP tests find significant results of stationary funds collected from conventional banks. The two tables below present the tests of the stationery of the allocated funds of the participating and conventional banks:

Table 4: Results of stable allocated funds of participating banks

	Second difference							
	ADF			PP			KPSS	
	Statistic	Critical val	p-value	Statistic	Critical val	p-value	Statistic	Critical val
Model 1	-16.90626	-3.517847	0.0001	-59.30748	-3.517847	0.0001	0.245599	0.739000
Model 2	-16.79521	-4.081666	0.0001	-71.85386	-4.081666	0.0001	0.157461	0.216000
Model 3	-17.00602	-2.595340	0.0000	-42.44982	-2.595340	0.0000	-	-

Source: Author's calculation by using Eviews v10.

From this table, we note that in the second difference, the three tests showed that the variable "Allocated Funds" of the participating banks are stationary, in another way, it is said that this variable is integrated of order 2 (I2). However, the results of the steady state of the variable concerning the allocated funds of conventional banks are summarized as follows :

Table 5: Results of stable allocation of funds from conventional banks

	Second difference							
	ADF			PP			KPSS	
	Statistic	Critical val	p-value	Statistic	Critical val	p-value	Statistic	Critical val
Model 1	-8.810317	-3.522887	0.0000	-59.28811	-3.517847	0.0001	0.192013	0.739000
Model 2	-8.862606	-4.088713	0.0000	-60.71519	-4.081666	0.0001	0.168079	0.216000
Model 3	-8.742369	-2.597025	0.0000	-47.95288	-2.595340	0.0000	-	-

Source: Author's calculation by using Eviews v10.

We note from this table that the variable concerning the funds allocated, whether at the level of participating or conventional banks, is stationary in second difference, it is therefore integrated in order 2 (I2).

As a result, the stationary nature of the two study variables allowed us to move to simple linear regression between the variables to be explained, and the explanatory variables. However, at the level of simple linear regression, we will first base ourselves on the correlation coefficient, which will allow us to know whether there is a strong correlation between the independent variables and the variables dependent on our research work.

Then we will use the coefficient of determination, which will allow us to know whether our model explains reality or the opposite. By finalising by the threshold of significance, to know if the regression is significant. However, under the SPSS software, we calculated the correlation coefficient between funds raised from participating banks as an independent variable and those of their conventional counterparts (dependent variable) as shown in the table below :

Table 6 : Correlation Coefficient

		Funds raised from conventional banks	**Funds raised from participating banks**
Pearson correlation	Funds raised from conventional banks	1,000	,310
	Funds raised from participating banks	,310	1,000
Sig.	Funds raised from conventional banks	-	,003
	Funds raised from participating banks	,003	-

Source: Author's calculation by using Eviews v10.

As this table shows, the correlation coefficient is not close to 1, it is equal to 0.31 or 31%, It can therefore be seen that the funds raised by participating banks are not strongly correlated with those of conventional banks, in other words, the two variables do not vary in the same direction. However, the following table presents the coefficient for determining the variable "Funds Raised" of participating banks and that of conventional banks :

Table 7: Template Summary

Model	**R**	R^2	R^2 **adjusted**	**Standard error of estimate**	**Change in the statistics**				
					Variation of R^2	**Variation of F**	**ddl1**	**ddl2**	**Sig. Variation of F**
1	,310[a]	,096	,085	800,741321	**,096**	8,322	1	78	**,005**

Source: Author's calculation by using SPSS v21.

The software SPSS gave us a coefficient of determination equal to 0.096, so it is far from 1, so we note that the model is not close to reality, in another way it is said that the funds raised from participating banks account for only 9.6% of the change in funds raised from conventional banks. In addition, the assessment of the overall quality of this linear

modelling requires an ANOVA variance analysis, the results of this analysis are presented in the following table :

Table 8: Analysis of Variance (ANOVA)

Model		The sum squares	ddl	M squares	D	Sig.
1	**Regression**	5335969,772	1	5335969,772	8,322	,005
	Residual	50012559,774	78	641186,664		
	Total	55348529,546	79			

Source: Author's calculation by using SPSS v21.

By comparing the associated significance in the table (0.005) with the threshold of significance (0.05), it can be seen that the regression is highly significant. So, it can be said that the funds raised from participating banks explain the majority of the variability of funds raised from conventional banks within the mixed banking system of Turkey.

Certainly, after the analysis of the linear regression between the funds collected from participating banks and those of their conventional counterparts, we proceed to do the linear regression at the level of the funds allocated from the two types of banks. Indeed, the correlation coefficient between the Allocated Funds of the Turkish participating and conventional banks is measured by the 21st version of the software SPSS and presented in the following table :

Table 9: Correlation's Results

		Allocated Funds from Conventional Banks	**Allocated Funds from Participating Banks**
Correlation of Pearson	Allocated Funds from Conventional Banks	1,000	**,985**
	Allocated Funds from Participating Banks	**,985**	1,000
Sig. (unilateral)	Allocated Funds from Conventional Banks	–	,000
	Allocated Funds from Participating Banks	,000	–

Source: Author's calculation by using SPSS v21.

As this table shows, the correlation coefficient between the Allocated Funds of the participating banks and those of the Turkish conventional banks is estimated at 0.985 or a percentage of 98.5%, So it is closer to 1. Therefore, we result that the allocated funds of participating banks are strongly correlated with those of conventional banks, in another way, we say that the two variables vary in the same direction. In addition, the coefficient for determining the allocated funds of participating and conventional banks is presented in the following table :

Table 10: Template Summary

Model	R	R^2	R^2 adjusted	Standard error of estimate	Change in the statistics				
					Variation of R^2	Variation of F	ddl1	ddl2	Sig. Variation of F
1	,985[a]	,970	,969	83,264154	**,970**	2506,190	1	78	**,000**

Source: Author's calculation by using SPSS v21.

Under the SPSS v21 software, the coefficient of determination is 0.97, so it is close to 1, therefore the model is close to reality, In another way, it can be said that the allocated funds of participating banks account for 97% of the variation in the allocated funds of conventional banks. However, in order to assess the overall quality of the regression, we proceed to the variance analysis ANOVA given by the table below :

Table 11 : Analysis of Variance (ANOVA)

Model		The sum squares	ddl	M squares	D	Sig.
1	**Regression**	17375210,878	1	17375210,878	2506,190	,000
	Residual	540767,705	78	6932,919		
	Total	17915978,583	79	-	-	-

Source: Author's calculation by using SPSS v21.

By comparing the associated significance (0.000) in the table with the threshold of significance (0.05), we find that the regression is highly significant. As a result, the allocated funds of participating banks may explain the majority of the variability of the allocated funds of conventional banks in Turkey's mixed banking system.

Certainly, on the basis of these results, we find that there is a linear regression between the funds raised and the allocated funds of the participating banks and those of their conventional counterparts. Therefore, we can say that participatory banks partially achieve synergies effects on conventional banks in the mixed banking system of the Turkish Republic.

5. Conclusion

In theory, and since their appearances, participatory banks have contributed to the economic development of developed and developing countries, bringing more stability and contributing to growth, while integrating into the banking system new social strata that could never have benefited from conventional bank financing, mainly through formulas of the prohibition of interest and profit and loss sharing. To conclude, we can say that the empirical study carried out in our present research work, we found that participatory banks partially realize synergies effects on their conventional counterparts in Turkey's mixed banking system. Moreover, these effects of these participatory banks can be explained first by the ethical principles on which participatory finance is based, including mainly the prohibition of interest and the sharing of losses and profits. And secondly, by the competitive pressures between the two types of banks, as well as certain

orientations and behaviours that do not always favour the development of the banking system or rather the economic development of the country.

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