

Analysis of the Transmission Asymmetry of Monetary Policy in A Dual Banking System: Econometric Modelling (Case of Turkey)

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Abstract—the purpose of this research is to analyze the transmission mechanism of monetary policy in a dual banking system, composed of both Islamic banks and Conventional banks, highlighting the factors that may influence behavior of Banks on the impact of monetary stimuli on their rates. In this context, an econometric model that examines the effectiveness of transmission of monetary policy in a dual banking system by advocating the hypothesis of asymmetric transmission of monetary policy was developed and tested. To answer the research problem, the adopted methodology is based on the Vectoriel Autoregressive (VAR) model, which is not only explanatory but also predictive.

The different results obtained through the empirical investigation carried out are discussed by exposing their methodological and theoretical implications.

Keywords-component: Policy, Transmission Asymmetry, Islamic Bank, Conventional Bank, Central Bank.

I. INTRODUCTION

Islamic finance emerged a few decades ago as a new financial system whose conceptualization is built around the integration of the ethical dimension into financial dynamics. Nevertheless, despite the development of Islamic finance thanks to its financial transparency, it was not spared the flaws and limitations that compromise its success or at least weakens it.

Indeed, the implementation of a Chariâa-compliant monetary policy is one of the major challenges to be met because of the scarcity of monetary policy instruments while remaining faithful to the principles of the Shariâa, particularly for economies that have adopted a dual banking system such as Pakistan, Malaysia and Indonesia where the central bank should conduct monetary policies influencing both

conventional and Islamic banking systems, in order to effectively influence the overall macroeconomic situation.

In this context, the main objective of this research is to analyze the transmission of monetary policy in a dual banking system, composed of both conventional banks and Islamic banks, through the bank loan, taking into account the impact of certain factors, notably bank liquidity and market structure, on the banks' behavior with regard to the transmission of monetary impulses on the interest rate.

This study aims to test the validity of the transmission of monetary policy impulses to bank retail rates in a dual banking system by providing empirical evidence on this issue. To achieve this goal, this study compares the impact of monetary policy shocks, represented by interest rate shifts, to the major balance sheet positions of Islamic banks vis-à-vis traditional banks. Moreover, while most of the existing literature in this area focuses on the implementation of monetary policy through so-called conventional policy instruments, this research offers a new dimension in assessing the impact of policy shocks in a dual banking system. Such perspectives would allow us to draw several conclusions about the stability and viability of Islamic financial instruments for the implementation of monetary policy.

Another aspect of the novelty of this study is in terms of the methodology employed. In fact, this study adopts several econometric investigation techniques to come to conclusions about this issue. In this regard, the study contributes to enriching the empirical literature in the field of monetary policy transmission in a dual banking system.

Following the results obtained, our article will be developed as follows: the first and second sections will be dedicated to the presentation of general information concerning the development of the Islamic banking sector in Turkey by

highlighting the historical aspect of the establishment of the Islamic finance and reviewing the literature review related to the analysis of the transmission mechanism of monetary policy in a dual banking system. Section 3 describes the nature of the data and the methodology used in this study. Section 4 and 5 present the empirical results. Finally, the last section will be dedicated to the presentation and discussion of the main results obtained through this study.

II. OVERVIEW OF THE DÉVELOPPEMENT OF ISLAMIC BANKING INDUSTRY IN TURKEY

The last decades have been characterized by sustained economic growth, where the financial system has played a crucial role. Banks have been at the center of this development and have undergone a profound change. Nevertheless, this period was also characterized by the appearance of a higher number of financial crises [29], [8]. Indeed, the recent global financial crisis is described as the most significant in the history of global finance for the simple reason that it has weakened the financial system to create a global economic crisis.

In the wake of the crisis, new mechanisms have been introduced to rethink financial stability, such as: the introduction of new banking control standards, the limitation of excessive risk-taking, transparency, and the adoption of a new management discipline. It is in this context that Islamic finance is imposed through its fundamentally moral character distinguished by its financing techniques, based on participation and its principle of sharing profit and loss, can help to establish financial discipline and stability [28], [15]. This industry in full expansion is growing surprisingly fast. Since its inception thirty years ago, the number of Islamic financial institutions in the world has grown from one in 1975 to more than 300 today in more than 75 countries [30]. Moreover, where Islamic banks operate, their field of activity varies greatly: in some countries, the sector is entirely Islamic (Iran and Sudan); in others, the two systems coexist (United Arab Emirates, Indonesia, Malaysia and Pakistan) [31]; and in still others, there is only one or a few Islamic banks such as the case of Turkey.

Indeed, so-called "contemporary" Islamic finance has existed in Turkey for more than 30 years. In reality, the Ottoman Empire has imposed funding in accordance with Islamic law. However, the secular Republic of Turkey ended, from 1923, the Islamic legislation in force (Sharia) and banned any form of religious reference, especially Islamic, movement which for decades resulted in restrictions to freedom of religion [6]. However, in recent years, the government has allowed the Turks to draw inspiration from their "glorious" past. This return to the sources has given an increasingly solid legal basis for Islamic financing. The history of the Islamic banking in Turkey started more precisely in 1983 when, in order to attract more capital from the Middle East, the government created a new legal framework allowing Islamic banks to operate in the country side by side with conventional banks [18]. In the beginning, Islamic banking institutions were named in the banking legislation of the "special finance companies" that we

quote: Al Baraka, Kuveyt Türk, Faisal Finans, Anadolu Finans, Ihlas Finans and Asya Finans.

However, these banks did not enjoy the same status as conventional banks, as they were not allowed to invest in government securities and were not covered by the deposit guarantee scheme of the Turkish Central Bank (Hardy, 2012). This regulatory framework was subsequently improved in 1999 and again in 2001, and in 2004; the government extended its deposit guarantee to special financing companies. A year later, the publication of a new banking law marked a new turning point. Indeed, special financial institutions are now referred to as "participatory banks". While this law does not at any time refer to Islamic law or the prohibition of interest. Participatory banks and conventional banks are therefore treated on an equal footing. Moreover, this banking law defines certain Islamic credit operations or the participatory account by referring to the principle of sharing of losses and profits.

Between 2014 and 2015, the Islamic banking sector faced another internal difficulty. It was no secret that Bank Asya, the market leader, had a direct relationship with the Gulenist movement and that a considerable number of deposits had been withdrawn by the public because of hostile actions of the Gulenists against the government at the end of 2013. Subsequently, Bank Asya refused to share information about its preferred shareholders and its control was transferred to the Deposit Insurance Fund, which significantly disrupted the Islamic banking sector and significantly reduced its total market share. While Bank Asya's disenchantment has had a negative effect on the upward trend, the entry of two large state-owned banks into the sector should put this trend on the right track. These are Ziraat Participation Bank in 2015 and Vakıf Participation Bank in 2016. The historical process of the participation bank in Turkey is presented in Table I.

TABLE I. : HISTORICAL PROCESS OF PARTICIPATION BANKS IN TURKEY

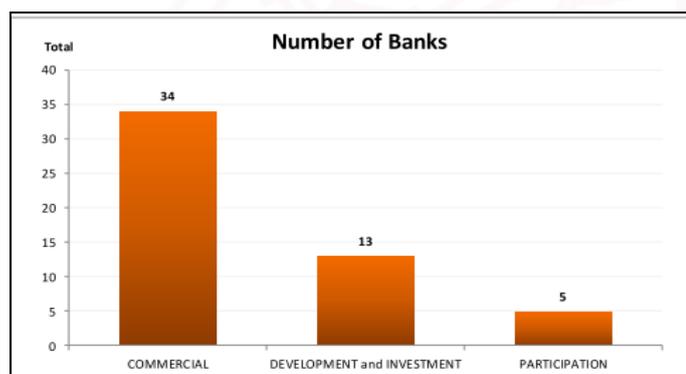
Date	Process	Activity status
1983	Issuance of the Decree No. 83/7506 of the Council of Ministers for the establishment of special finance houses	Status of Special Finance Houses was transferred into status of Participation Banks in 2006.
1985	Establishment of Albaraka Türk Special Finance House	It continues to operate as Albaraka Türk Participation Bank.
1985	Establishment of Faisal Finans Special Finance House	The name of the bank was changed as Family Finans Special Finance House in 2001. It merged with Anadolu Finans Special Finance House in 2005 and the name of the bank was changed as Türkiye Finans Participation Bank. It continues to operate under the same name.
1989	Establishment of Kuveyt Türk Special Finance House	It continues to operate as Kuveyt Türk Participation Bank.
1991	Establishment of Anadolu Special Finance House	It merged with Family Finans Special Finance house in 2005.
1995	Establishment of Ihlas Special Finance House	It was liquidated in 2001.
1996	Establishment of Asya Finans Participation Bank	It was transferred into Saving Deposits Insurance Fund in 29 May 2005 and liquidated in 22

		July 2016.
2005	Establishment of Türkiye Finans Participation Bank	It is established in 2005 with the merger of Family Finans Special Finance House and Anadolu Special Finance House.
2015	Establishment of Ziraat Participation Bank	It continues to operate.
2016	Establishment of Vakıf Participation Bank	It continues to operate.

Source : (BUĞAN, 2015) and (Varsak, 2017)

At present, only five participating banks have remained in Turkey to coexist with 47 conventional banks and banks, namely the Albaraka Türk holding bank, the Kuveyt Türk holding bank, the Turkish participation Finans, Vakıf holding bank and Ziraat Bank.

Figure 1. Evolution of the number of banks by type in Turkey



Source: Banking Regulation and Supervision Agency December 2018

III. LITERATURE REVIEW

Before you begin to format your paper, first write and save the content as a separate text file. Keep your text and graphic files separate until after the text has been formatted and styled. Do not use hard tabs, and limit use of hard returns to only one return at the end of a paragraph. Do not add any kind of pagination anywhere in the paper. Do not number text heads- the template will do that for you.

The analysis of the transmission mechanism of monetary policy in a dual banking system represents a new theme in academic research in monetary and banking economics. Recent literature has revealed that the transmission mechanism of monetary policy in a dual banking system may have a different impact depending on the type of bank which may affect the effectiveness of monetary policy [21]; [7]; [2] and [25].

Indeed, several authors have examined the conduct of monetary policy in a dual banking system by analyzing the contribution of the financial sector in the transmission of monetary policy found that the behavior of conventional banks in the pass-through of monetary impulses on their rates may be completely different from their Islamic counterparts [17]; [23] [24]. According to (Sukmana & Kassim, 2010), the transmission of monetary impulses to the real economy can be carried out through several channels, such as interest rate, credit, asset price and exchange rate channels [25]. The relative

importance of a particular channel in the transmission of monetary policy generally depends, inter alia, on the structural features of the economy. For example, a very open economy where the foreign trade sector plays a crucial role in the creation of economic activity could opt for the exchange rate channel. Similarly, a country that relies heavily on the economic activity of the bank may find that the lending channel is the most appropriate for the transmission of monetary policy. Moreover, for countries adopting a dual banking system, the bank loan channel occupies an important place in channeling the effects of monetary policy.

Several authors like [16] & [20] have supported the use of this transmission channel especially for economies with two banking systems. These authors used rigorous econometric techniques that yielded detailed and conclusive results about the role of the bank lending channel in the transmission of monetary policy among countries adopting a dual banking system. In addition, a good number of research studies show that the impact of a change in monetary policy on conventional banks is less intense than for Islamic banks, which means that Islamic banks are more sensitive in terms of pass-through monetary shocks on these financing rates [12]; [13] and [14].

Although the nature of financial intermediation is one of the essential elements of this difference in response to the transmission of monetary policy in a dual banking system, the theoretical and empirical literature highlights the existence of other factors that may explain this resilience of the banking sector to monetary shocks, including bank liquidity, size, capitalization and / or market structure. The first work in this area is done by Kashyap and Stein (1995). By examining disaggregated balance sheet data, the two authors compare the sensitivity of the supply of credit following a monetary shock according to the size criterion. They deduced that smaller banks exhibit less rigidity in the face of a monetary policy shock [19].

In other works, Kashyap and Stein (1997) examine this time the impact of banks' liquidity in relation to the transmission process of monetary policy, they deduced, whereas the liquidity criterion is decisive in explaining the behavior of banks face a monetary shock so that less liquid banks are more sensitive to monetary policy shocks. By pressing, the results of Kashyap and Stein [22] authenticate the role of bank size and liquidity in the transmission of money. For studies on African countries, we find the work of [4] having examined the impact of monetary shocks on banking behavior for Morocco, Jordan, Tunisia and Egypt. They concluded that, at Jordanian level, only size can affect the rate and magnitude of transmission. As for Morocco, Tunisia and Egypt, the liquidity and the size of the banks impact respectively the transmission of monetary shocks. Competition also affects the process of transmitting key rates at bank rates.

In fact, the competitive intensity between banks impacts the adjustment of bank rates following changes in the monetary policy of bank rates following changes in monetary policy. Indeed, by seeking to mitigate the repercussions of a monetary shock, banks adopt a credit control strategy to protect the quality of their portfolios. In the event of a monetary shock, the

banking institutions decide not to pass on the increase in the cost of refinancing on their rates which neutralizes the effect of the shock on the rates. On the other hand, they will deprive the volume of the credit granted to neutralize the increase of the cost of liquidity. Competition can still influence the quality of the transmission of monetary policy. For [10], the degree of competition between banks leading to a more or less complete adjustment of rates of detail. Differences in the nature of financial intermediation institutions may again be one of the factors explaining the asymmetry of transmission of monetary policy in a given economy. These are dual banking systems that consist of both conventional and Islamic banks.

Over the last thirty years, Islamic banks have been gradually introduced in several countries side by side with conventional banking institutions. That said, financial and monetary relations, in a dual financial system, must be organized and conducted in such a way as to take into account the distinct nature of this finance, in particular, in relation to the transmission of monetary policy [28], [11].

However, few studies have examined the transmission of monetary policy in a dual banking system by taking into account the previously cited factors to justify the asymmetry of transmission noted in systems encompassing both conventional banks and Islamic banks [1] & [9]. In this context, we seek, through the present work, to empirically explore the transmission of monetary policy in a dual banking system via the bank loan channel through a comparative analysis between the behaviors of conventional banks versus Islamic banks vis-à-vis banks variability of monetary policy to justify the asymmetry of reactions to monetary shocks. This asymmetry will be examined using autoregressive models, in particular VECM's estimation of the behavior of Islamic banks and conventional banking groups to estimate the responses of banks to monetary shocks.

IV. DATA AND METHODOLOGY

A. data

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Do not use abbreviations in the title or heads unless they are unavoidable.

As noted above, the econometric model under study relates the selected macroeconomic, financial and structural explanatory variables in order to assess the behavior of Islamic and conventional banks in the context of a comparative study on the attribution of changes in money market rates to their borrowing rate.

The monetary policy variable is represented by the interest rate, in this case the money market rate, henceforth designated by ON. The choice of the ON to represent the monetary policy variable in the case of Turkey is justified by the fact that by examining the empirical studies analyzing the transmission of monetary policy in a dual banking system, the authors opt for the interbank market as a proxy for the monetary rate.

At the same time, the objective variables include the balance sheet items of Islamic banks and conventional banks, namely total Islamic bank financing (CTI) and total conventional bank borrowing (CTC), as well as total loans from the banking sector (CT). Other objective variables are the consumer price index (CPI) and the industrial production index (IPI).

The impact of the structure of the banking industry on the transmission of the policy has often been examined through the effects of the monetary shock on interest rates and the quantity of credit. To measure bank concentration at the national level, the choice was made on the Herfindhal-Hirschman (HHI) indicator, which is often used to obtain complete information on the market shares of all banks in the sector. To measure the bank liquidity relative to the two types of Islamic and conventional banks, two different indicators are taken into account. To measure the liquidity of conventional banks, the Asset Liquidity Ratio option appears to be an indication of the liquidity available to deal with expected or unexpected requests from rated cash (CI). Regarding the liquidity of Islamic banks [27] have proposed a proxy for the calculation of short-term liquidity that can be used for Islamic banks the short-term funding ratio (STFR) noted (IL).

We built a monthly database for the 2007-2015 period constructed from aggregated banking data, Islamic banks as well as conventional banks in order to examine the differences in banks' responses to monetary shocks. The collection of banking sector data, monetary policy guidelines and macroeconomic variables are based on statistics and annual reports of central banks and reports of the International Monetary Fund.

B. Methodology

The current research is part of a series of research studies aimed at studying the transmission of monetary policy through the bank loan in a dual banking system that assumes the cohabitation of Islamic banks with conventional banks and banks. the impact of a monetary shock on the supply function of these last two by identifying the variables likely to influence the sensitivity of the banks in the face of a monetary shock. To this end, and to test the hypotheses of the research, it is advisable to opt for a modeling on data in time series relating to the banking sector of each country composing our sample.

Indeed, any econometric modeling work that is based on time series requires the examination of two basic conditions to avoid any fallacious regression; it is mainly, the verification of the assumption of normal distribution of the variables and that of their stationarities.

Thus, we used the enhanced Dickey Fuller test to check the stationarity of each variable by retaining the t-statistic of the test and its probability. The results of the test will be summarized in the table below where it appears that the CPI and IPI variables are stationary at level. The variables ITC, CL, IL, ON, HHI are stationary at first difference and the stationary CT and CTC variables at the second difference at a threshold of 1%.

To test the normality of the variables, the Jarque Berat test and the "Skewness" and "Kurtosis" coefficients were recommended. The results of the normality test for Turkey indicate that, apart from CL and CPI, the normality assumption is invalidated.

According to the results of the normality test, it turns out that the majority of the series do not follow a normal distribution and that the series are not stationary with the same order.

Thus, we cannot resort to estimating the econometric model by ordinary least squares.

At present, the objective is to examine the direction of evolution of the time series of the variables related to Islamic banks and those of conventional banks.

The examination of this evolution is to check if it is kept stable in the long term. From an empirical point of view, cointegration analysis makes it possible to identify the existence of a number of linear combinations that can be interpreted as possible long-term equilibrium relationships. In other words, the analysis of cointegration makes it possible to study non-stationary series, but of which a linear combination is stationary. It allows stable long-term relationships to be specified while simultaneously analyzing the short-term dynamics of the variables considered.

The offset length of all the models is selected according to the information criteria Akaike the Akaike criterion (AIC), the Hannan-Quin criterion (HQ), the Schwaz criterion (SC) and that of Forecast Prediction Error (FEP). The results of the test indicate that for the Turkish conventional banks, the number of delays retained is 2, while the number of delays set for the Turkish Islamic banks is 4.

V. ESTIMATION OF ECONOMETRIC MODELS OF THE TURKISH BANKING SYSTEM

A. Estimation of econometric models for Turkish conventional banks

After specifying the different models and the number of cointegration relationships for each. Now it is time to identify the long-term and short-term relationship between bank rates captured by both the interest rate for conventional banks and the financing rate for Islamic banks as well as the investment tool. The monetary policy presented by the monetary rate, the balance sheet variables (bank liquidity ratio) and the market structure captured by the Herfindahl-Hirschman concentration index. The table below presents the results of the estimation of the coefficients:

TABLE II. ECONOMETRIC ESTIMATION OF THE MODEL OF TURKISH CONVENTIONAL BANKS

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.060703	0.045315	-1.339590	0.0183
C(2)	0.016146	0.023604	0.684045	0.4958
C(3)	-2.75E-06	2.39E-06	-1.151388	0.2528
C(4)	0.187663	0.110306	1.701292	0.0925
C(5)	0.006451	0.101101	0.063808	0.9493
C(6)	0.441873	0.117170	3.771220	0.0003
C(7)	0.015671	0.127995	0.122434	0.0328
C(8)	1.99E-05	1.50E-05	1.330302	0.1870
C(9)	-1.73E-06	8.91E-06	-0.194126	0.8465
C(10)	-2.08E-05	1.81E-05	-1.152742	0.0252
C(11)	-1.59E-05	2.55E-05	-0.623307	0.0348
C(12)	0.008865	0.035545	0.249404	0.0037
C(13)	-0.007406	0.035722	-0.207318	0.0363
C(14)	9.61E-05	8.85E-05	1.086537	0.2803
C(15)	2.12E-05	6.20E-05	0.341446	0.7336
C(16)	-0.052969	0.113770	-0.465582	0.6427
C(17)	0.008276	0.093305	0.088698	0.9295
C(18)	0.001731	0.001845	0.937929	0.0365
C(19)	-0.000540	0.001406	-0.384089	0.0419
C(20)	0.032956	0.243197	0.135513	0.8925
R-squared	0.506163	Mean dependent var		-0.057314
Adjusted R-squared	0.273423	S.D. dependent var		0.818167
S.E. of regression	0.697401	Akaike info criterion		2.286732
Sum squared resid	41.34133	Schwarz criterion		2.792248
Log likelihood	-100.0534	Hannan-Quinn criter.		2.491577
F-statistic	3.059839	Durbin-Watson stat		1.994790
Prob (F-statistic)	0.000221			

Source: Personal results deducted from Eviews

The equations are an exception to the prescribed specifications of this template. You will need to determine whether or not your equation should be typed using either the Times New Roman or the Symbol font (please no other font). To create multileveled equations, it may be necessary to treat the equation as a graphic and insert it into the text after your paper is styled. The equation of the long-term relationship between the conventional interest rate and the different variables is thus:

$$d(IC) = -0.060703 * (IC(-1) + 3.90528510384E - 06 * CTC(-1) + 0.820649352581$$

$$*X\lambda(-1) - 0.00307763212966*III(-1) - 31.3811649419*XIII(-1) + 0.0441379271572*HHI(-1) - 224.62592965) (1)$$

The model is illustrated through this equation, which reveals the long-run relationship between the conventional interest rate and the model variables. Statistically, the model is robust since the R-squared exceeds 50% bound by the verification of the assumptions of the normality of the residues, their autocorrelations and the hypothesis of heteroscedasticity which reveal that the model is valid statistically.

B. Analysis of results (Review of short and long-term dynamics)

Error-correction relationships embody the joint combination of long-term and short-term relationships. In the middle of these two relations is the coefficient of return which is worth in equation 1 of the model (-0.060703).

This value represents the rate of adjustment of the bank interest rate following a monetary shock. The restoring force $A = (-0.060703) < 0$ also means that when a variable at time t deviates from the long-term equilibrium, the return speed after this difference (shock) is 0.060703.

In a simpler way, if there is a shock on the long-term equilibrium, it would take exactly 16.47 months ($1 / 0.060703$) to return to the equilibrium situation. It should be noted that this gap period between the occurrence of a shock and the return to a stable long-term equilibrium is relatively shorter compared to conventional banks.

With regard to the short-term dynamics, this one is established using the Wald test to verify the existence or not of a short-term relation between each of the variables and IC. Thus, according to the table displayed, the conventional interest rate holds a short-term relationship with the variables (monetary rate, total conventional credit, and liquidity of conventional banks and the concentration index of the banking market). In fact, the probability of acceptance of the null hypothesis is 5%.

TABLE III. RESULT OF THE WALD TEST ON THE EXISTENCE OF A SHORT-TERM RELATIONSHIP BETWEEN THE CONVENTIONAL INTEREST RATE AND THE MODEL VARIABLES.

The variables	IC conventional interest rate	Probability
ON (monetary rate)	Exists a short term relationship	0,0013
CTC (total conventional credit)	Exists a short term relationship	0,0476
CL (the liquidity of conventional banks)	Exists a short term relationship	0,0490
HHI (concentration of the banking market)	Exists a short term relationship	0,0116
IPI (index of industrial production)	Does not exist a short term relationship	0,5069
CPI (consumer price index)	Does not exist a short term relationship	0,8023

Source: Personal results deducted from Eviews

C. Estimation of econometric models for Turkish conventional banks

The same approach is followed for the Islamic banking pole where the model obtained is thus:

TABLE IV. ECONOMETRICA ESTIMATION OF THE MODEL OF TURKISH ISLAMIC BANKS

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.100368	0.098685	-2.618119	0.0110
C(2)	-0.039055	0.037174	-1.050602	0.2973
C(3)	3.75E-06	1.38E-06	2.722601	0.0083
C(4)	-0.042020	0.136756	-0.307260	0.7596
C(5)	0.300548	0.143418	2.095602	0.0400
C(6)	0.053376	0.164991	0.323508	0.7473
C(7)	0.169850	0.135963	1.249238	0.2160
C(8)	-0.081898	0.084696	-0.966974	0.0371
C(9)	0.147252	0.089454	1.646113	0.0145
C(10)	-0.089475	0.101003	-0.885860	0.0389
C(11)	0.258119	0.097428	2.649340	0.0101
C(12)	2.16E-05	8.69E-06	2.487610	0.0154
C(13)	-1.58E-05	8.67E-06	-1.817792	0.0736
C(14)	-1.55E-05	8.60E-06	-1.799333	0.0765
C(15)	-2.84E-05	7.78E-06	-3.657613	0.0005
C(16)	-2.46E-05	0.000122	-0.200685	0.0416
C(17)	-0.000143	0.000131	-1.091542	0.0270
C(18)	5.02E-06	0.000127	0.039438	0.0187
C(19)	4.59E-05	0.000119	0.386952	0.0300
C(20)	0.002553	0.001797	1.420493	0.0196
C(21)	0.001965	0.001668	1.178242	0.0429
C(22)	0.003143	0.001420	2.213267	0.0303
C(23)	0.000869	0.001135	0.765710	0.0466
C(24)	0.128023	0.132766	0.964276	0.3384
C(25)	0.100278	0.111651	0.898138	0.3724
C(26)	0.109273	0.087645	1.246777	0.2169
C(27)	0.014934	0.072916	0.204813	0.8383
C(28)	4.58E-05	0.000114	0.400000	0.6904
C(29)	-1.33E-05	8.74E-05	-0.152663	0.8791
C(30)	-4.53E-05	7.43E-05	-0.610086	0.5439
C(31)	-3.52E-05	4.95E-05	-0.711040	0.4796
C(32)	-0.025609	0.067299	-0.380520	0.0048
C(33)	-0.169599	0.083721	-2.025767	0.0468
C(34)	-0.175791	0.080871	-2.173709	0.0333
C(35)	-0.061805	0.073914	-0.836180	0.0401
C(36)	0.074716	0.144211	0.518104	0.6061
C(37)	0.008504	0.003020	2.816114	0.0064
R-squared	0.629259	Mean dependent var	-	0.014944
Adjusted R-squared	0.427037	S.D. dependent var		0.623146
S.E. of regression	0.471686	Akaike info criterion		1.608366
Sum squared resid	14.68419	Schwarz criterion		2.554822
Log likelihood	-45.83086	Hannan-Quinn criter.		1.991713
F-statistic	3.111721	Durbin-Watson stat		2.047535
Prob (F-statistic)	0.000032			

Source: Personal results deducted from Eviews

The equation of the long-term relationship between the Islamic financing rate and the different variables is thus:

$$d(IF) = -0.100368 * (if(-1) + 5.50519424415e-05 * itc(-1) + 0.0297623318507 * hhi(-1) + 6.47462623409 * cpi(-1) + 0.00109689185527 * ipi(-1) + 0.246522330064 * il(-1) - 0.0747025810944 * @trend(07m01) - 156.385106538) (2)$$

Statistical analysis of these results reveals that the model is statistically robust as R-squared exceeds 60% and verification of the hypotheses of normality of residues, their autocorrelations and the hypothesis of heteroscedasticity revealed the validity of the model.

D. Analysis of results (Review of short and long-term dynamics)

Error-correction relationships embody the joint combination of long-term and short-term relationships. In the middle of these two relations is the coefficient of return which is worth in equation 2 of the model (-0.100368).

This value represents the rate of adjustment of the bank interest rate following a monetary shock. The restoring force A = (-0.100368) <0 also means that when a variable at time t deviates from the long-term equilibrium, the return speed after this difference (shock) is 0.100368.

In a simpler way, if there is a shock on the long-term equilibrium, it would take exactly 10 months (1 / 0.100368) to return to the equilibrium situation. Note that this gap between the occurrence of a shock and the return to stable long-term equilibrium is relatively shorter compared to conventional banks that need 16.47 months.

With regard to the short-term dynamics, this is also established using the Wald test to check whether or not there is a short-term relationship between each variable and FI. Thus, according to the table displayed, the Islamic financing rate holds a short-term relationship with the variables (monetary rate, total credits of Islamic banks, liquidity of Islamic banks and the concentration index of the banking market). In fact, the probability of acceptance of the null hypothesis is 5%.

TABLE V. RESULT OF THE WALD TEST ABOUT THE EXISTENCE OF A SHORT-TERM RELATIONSHIP BETWEEN THE ISLAMIC FINANCING RATE AND THE VARIABLES OF THE MODEL.

The variables	IF Islamic financing rate	Probability
ON (monetary rate)	Exists a short term relationship	0,0218
ITC (total Islamic credits)	Exists a short term relationship	0,0330
IL (the liquidity of Islamic banks)	Exists a short term relationship	0,0177
HHI (concentration of the banking market)	Exists a short term relationship	0,0124
IPI (index of industrial production)	Does not exist a short term relationship	0,7771
CPI (consumer price index)	Does not exist a short term relationship	0,7089

Source: Personal results deducted from Eviews

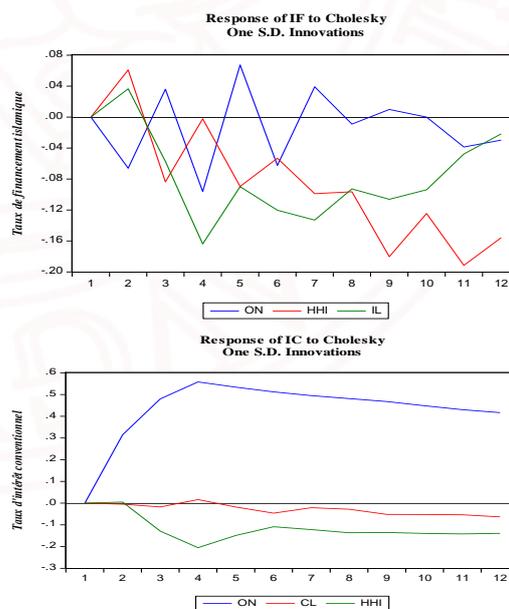
VI. VARIANCE DECOMPOSITION AND IMPULSE ANALYSIS

In the context of our work, it is important to know the impact of changes in the money market rate on lending rates, since in addition to the explanatory aspect of our model, it also has a predictive power.

The most common methodology for analyzing the short-term dynamic relationships between the monetary rate and the other variables, whether financial or real is through the examination of the dynamic response of the autoregressive vector following a simulation of the shock. It is a matter of simulating a monetary policy shock on the banking conditions of the countries that are the subject of our study. This simulation consists of comparing the impulse response of Islamic banks as well as conventional ones following a monetary shock. The values of the impulse response functions provide information on the extent and delay of banks 'pass-through of central bank decisions, taking into account the amplifying or limiting factors of the banks' reaction process following a monetary policy shock.

In the context of this study, the Impulse response function (IRF) reflects the magnitude and timing of responses of objective variables (IPI, IF and IC) to a shock in the monetary policy variable (ON). This allows a comparison of the extent of responses of objective variables to political shocks for both conventional and Islamic banks. It is thus the simulation of a shock of monetary policy on the banking conditions that it is on the side of the Islamic banks or conventional banks of the Turkish banking system. To obtain the functions of impulse response, it was necessary to take again the model error correction already estimated for each bank. The VECM representation of the resulting model is used to compute the impulse response functions.

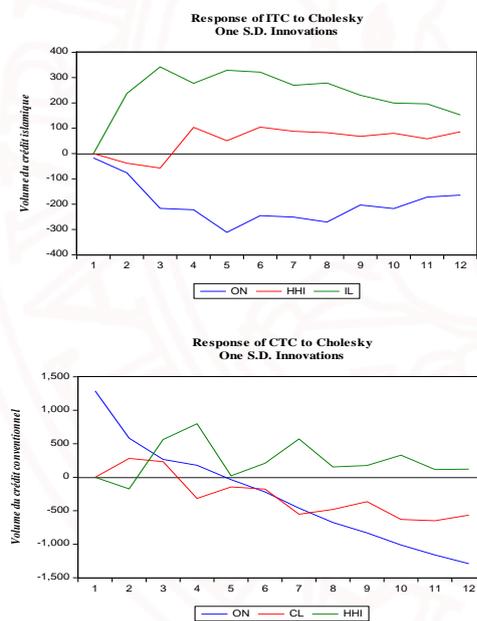
Figure 2. Interest rate simulation of the Turkish banking system



Source: Personal results deducted from Eviews

The analysis of the impact of the monetary shock on the conventional interest rate reveals that the shock of the positive monetary interest rate causes a very sharp rise in the conventional interest rate which reaches a maximum value in the 4th month after the shock before it knows a slight downtrend and stability at the end of the period. For Islamic banks, a notable difference in terms of the reaction of the financing interest rate to a monetary shock seems rather cyclical compared to conventional banks. Indeed, there is a significant negative relationship between the Islamic financing rate and the monetary rate, this finding suggests that Islamic banks for example in Turkey grant credit pro cyclically [3]. One possible explanation for this relationship is that the demand for Islamic loans is lower during periods of high interest rates because consumers do not want to lock in their loan commitment at high interest rates. For the effect of banking characteristics, namely liquidity and the power of the market, note that conventional banks proceed by increasing their interest rates by keeping their liquidity positions more or less stable. For Islamic banks, the level of liquidity seems to be in a sharp downtrend showing a negative relationship with the financing rate.

Figure 3. Simulation of reaction of the credit volume of the Turkish banking system.



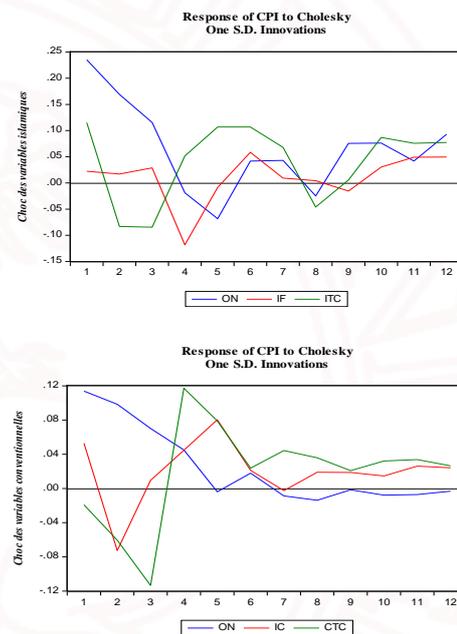
Source: Personal results deducted from Eviews

The impulse response function of the credit volume reflects the negative response of the conventional credit supply following the shock of the monetary rate. However, Islamic financing seems to be more impacted by the monetary shock since the fall in credit supply is simultaneous with the shock, whereas for conventional banks, the impact of the rate shock has had an impact on the supply of credit in a gradual way. The supply of credit also depends on the liquidity position and market power, which gives rise to different reactions on the banks. Indeed, for conventional banks, the interest rate does not

act in an immediate way on the credit offer until the fifth month following the shock.

The combination of the level of liquidity with the uncompetitive and concentrated nature of the Turkish banking system largely explains the credit behavior of credit institutions. On the side of Islamic banks, the concentration of the banking market and the low level of liquidity amplify the reaction of the supply of credit to the shock of the monetary rate. In addition, liquidity and market power are among the structural factors behind this asymmetry in the transmission of monetary policy in a dual banking system.

Figure 4. Simulation of reaction of the consumer price index (Turkish banking system).



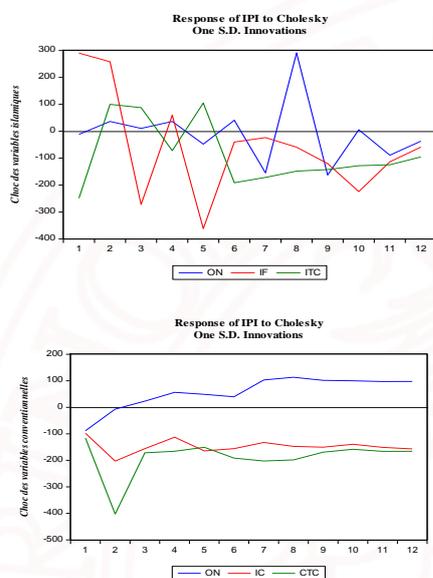
Source: Personal results deducted from Eviews

In terms of the impact of a shock of conventional variables on inflation, the impulse function graph shows that the monetary shock triggered a rise in the interest rate, a process that explains the decline in interest rates Inflation as measured by the consumer price index during the first quarter the movement of the debit interest rate following the monetary shock causes inflation to decrease persistently and then gradually returns to its long-term value. During the second quarter, the money market rate fell; however, the short-term bank rates materialize the expectation of a rise in the monetary rate and subsequently the resurgence of inflation from the end of the 4th month.

As for the transmission of the monetary shock via the Islamic loan channel, a rather weak reaction of Islamic banks following a monetary shock. This weak effect is reflected more rapidly in the real economy is manifested by the fall in the financing of the volume of credit Islamic from the first month after the shock. However, the impact of the monetary rate on inflation through the Islamic financing rate seems to appear

later compared to conventional banks. Moreover, the fact that Islamic banks do not operate with a rate of interest may suggest they are not subject to interest rate risk. It should be noted that fluctuations in the interest rate can affect and endanger the revenues of Islamic financial institutions that use a base rate to index and value financial instruments.

Figure 5. Response simulation of the index of industrial production (Turkish banking system)



Source: Personal results deducted from Eviews

In the same vein, consider the two impulse response functions of the index of industrial production following the shock of conventional variables as well as that of the Islamic variables. Indeed, at the level of the reaction of the index of industrial production, following the shock of conventional variables, the rise in the monetary interest rate leads to a fall in the supply of credit; therefore, industrial production falls after a delay of two months following the shock. After this phase, the impact of the monetary shock eases to begin its decline towards its equilibrium level after twelve months.

On the side of Islamic banks, the transmission of the impulses of the shock of the monetary rate registered a shift compared to the conventional banks so that a slight fall of the index of the industrial production registered 5 months after the monetary shock. As regards the impact of the supply of credit, it turns out that financing on the basis of the principle of sharing of losses and profits gives more importance to the profitability of projects, while that based on interest is only concerned with the creditworthiness of the debtors, which explains the maintenance of the stability of the economic activity until the 6th month before the offer of Islamic financing falls with modest attempts to increase are not very significant from the 11th month. However, we can say that the monetary shock limits the ability of Islamic banks to provide financing, resulting in a contraction of the real economy.

VII. CONCLUDING LESSONS AND DISCUSSION OF THE RESULTS

At the level of this analysis, the study focused on the transmission mechanism of monetary policy in a dual banking system by highlighting the factors likely to impact this transmission process. To achieve this objective, it was necessary to conduct an analytical study by seeking to answer the main questions raised about the transmission efficiency of monetary policy and the potential effect of asymmetry in the transmission process.

Indeed, the results of the econometric study show that, indeed, monetary policy is transmitted to banking conditions via the bank loan channel in the case of a dual banking system, composed of both conventional banks and Islamic banks. These results seem consistent with those found by previous empirical investigations such as the work of (Altunbas, Fazylov and Molyneux, 2002, Gambacorta, 2005, Kishan and Opiela, 2000) for the conventional banking system and (Cihák and Hesse, 2010; al., 2013, Abedifar et al., 2013, Yousuf et al., 2014, Sukmana and Kassim, 2010, Kassim et al., 2009) for a dual banking system.

Indeed, the bank lending channel highlights the impact of the variation in the bank financing offer on the behavior of economic agents following a monetary shock. This channel takes all its meaning in an environment where information is asymmetrical and imperfect substitutability characterizes credit / securities arbitrage. In this context, non-financial agents dependent on bank credit, such as households and new businesses, are directly affected by the rationing (increase) of borrowing possibilities linked to an increase (decrease) in banks' refinancing terms with the central bank. In addition, when a tightening of monetary policy is initiated, it is noted that the credits granted to economic activity diminish through two effects: that of price and that of volume. In the first case, the banks pass on the increase in their financing costs to their lending rates. This discourages some of the potential borrowers for whom the cost of capital appears too high. In the second, banks prefer to cap lending rates at a given level.

Monetary policy also impacts banking behavior in terms of credit distribution, which proves that bank intermediaries do play a central role in the transmission of monetary policy, since the effects of monetary policy depend on its impact on these banking institutions.

The results of this study also support the impact of the banking market structure on the transmission process of monetary policy to banking conditions for a dual banking system. Indeed, according to the Structure-Behavior-Performance (SCP) model, the degree of competition and concentration of the banking sector impacts the behavior of banks in terms of the impact of changes in money market rates on their lending rates. Indeed, banks with large market power can absorb monetary policy changes to protect their profitability. As a result, a monetary shock will have less impact on interest rates.

In this context, the concentration levels of the different banking systems may explain, in part, differences in the

transmission patterns of monetary policy, particularly in the case of countries adopting a dual banking system. Moreover, several studies confirm these results, for example, the works of Cottarelli and Kourelis, 1994; Cottarelli et al. 1995; Corvoisier and Gropp, 2002; Leuvensteijn et al. 2008; Adams and Amel, 2005; Olivero, Li and Jeon, 2011; Ali Mirzaei, 2011, said that the structure of the banking market influences the sensitivity of banks to the transmission of monetary policy via the bank loan channel.

Bank liquidity may still be a source of alteration in the transmission of monetary policy. The results revealed that less liquid banks respond more strongly to a monetary shock than banks with a very high level of liquidity. In the case of a restrictive monetary policy, the most liquid banks manage to respond easily to loan requests without being forced to switch to a tightening of their credit supply. The impact of the monetary shock is greater on the less liquid loan function. In the case of this analysis, Islamic banks are better able to pass on monetary shocks to their credit supply because of their low liquidity compared to conventional banks. The results reported here are confirmed by previous empirical studies that indicate that the level of bank liquidity alters the transmission of monetary policy like Kashyap and Stein, 2000; Ehrmann et al, 2001; Altunbas et al., 2010.

Finally, from the examination of the banks' reaction in the context of a comparative study between the behavior of conventional banks and that of Islamic banks in a dual banking system in the face of a monetary shock, it turns out that the impact of monetary stimuli on their bank rates is asymmetrical, which can affect the effectiveness of monetary policy. In the context of the present study, this asymmetry can be amplified by the combination of several factors, in particular, the liquidity level and the structure of the banking market, which constitute a set of factors responsible for recurrent asymmetries of transmission of monetary policy.

For the verification of such an assumption, it was necessary to seek, through this study, to analyze the relevance of the bank loan channel in a dual banking system in terms of channeling the effects of monetary policy towards the real economy. Given that this field of study targets countries with a dual banking system, it is useful to consider whether Islamic banks are also able to respond in the same way as their conventional counterparts once the central bank imposes some monetary policy.

Indeed, the results show that conventional banks can reduce the intensity and magnitude of monetary impulses compared to Islamic banks that are more sensitive to monetary shocks. All in all, in a dual banking system that assumes the cohabitation of Islamic banks with conventional banks, there may be the problem of asymmetric transmission of monetary policy related to the difference between financial intermediation among Islamic banks by compared to their conventional counterparts. This asymmetry is amplified by several factors that determine the resilience of the banking sector to monetary shocks, including bank liquidity and the structure of the banking market. In this respect, this observation corroborates the conclusion of the work of Zarqa, 1983; Khan and Mirakhor,

1990; Errico and Farahbaksh, 1998; Rosly, 1999; Kassim et al., 2009; Abedifar et al., 2013; Cihak and Hesse, 2010; Hasan and Dridi, 2011; Rajhi and Hassairi, 2013; Aysan, Disli, Ng, et al., 2016.

CONCLUSION

Islamic finance emerged a few decades ago as a new financial system whose conceptualization is built around the integration of the ethical dimension into financial dynamics. Nevertheless, despite the development of Islamic finance thanks to its financial transparency, it is not spared the flaws and limitations that compromise this success or at least weaken it. Indeed, the implementation of a Chariâa-compliant monetary policy is one of the major challenges to be met because of the scarcity of monetary policy instruments while remaining faithful to the principles of the Shariâa, in particular for the economies having adopted a dual banking system such as Turkey, Malaysia and Indonesia where the central bank should conduct monetary policies influencing both conventional and Islamic banking systems, in order to effectively influence the overall macroeconomic situation.

Thus, the main objective of this research is the identification and analysis of the monetary policy transmission process via the bank loan channel in a dual banking system. In addition, this research examined the key factors that determine the resilience of the banking sector to monetary shocks, including liquidity and the structure of the banking market. Indeed, these factors are advanced in the literature as potentially affecting the transmission channels by impacting the behavior of banks on the impact of monetary impulses on their rates. The results obtained also support the contribution of these factors in the difference in reaction of conventional banks compared to Islamic banks in the face of a monetary shock, which made it possible to justify the asymmetry of transmission of monetary policy in a dual banking system.

After having constructed a theoretical frame of reference based on the literature review, the empirical study focused on a sample of three countries having adopted a dual banking system, for the period between 2007 and 2015. In this which is the empirical method used, we used the autoregressive vector model, especially an estimate with the cointegration model.

According to the results obtained at the level of the empirical study, the transmission of the monetary policy is confirmed for the case of a dual banking system via the bank loan channel. Indeed, the long-term relationship assumptions and the dynamic adjustment of bank rates following a currency shock are confirmed. In addition, the asymmetry hypothesis of the transmission of monetary policy in a dual banking system is confirmed, since Islamic banks show a greater degree of sensitivity than conventional banks in terms of the impact of changes in the money rate on their rates.

This comparative analysis between the behavior of Islamic banks and conventional banks on the transmission of monetary impulses through banking conditions seems to provide a more scientific and deeper insight into the transmission mechanism of monetary policy in a dual banking system as well. The main

factors that may affect banks' sensitivity to the rate of adjustment of their rate to a monetary shock.

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