

The Empirical Analysis of the Determinants of Bank-non-Intermediation Income and Gold and Oil Co-movement Analysis

Adama Dembele

School of Social Sciences, Istanbul Sabahattin Zaim University

Abstract

This paper consists an introduction and two main parts, the introduction gives abroad idea about the determinants of Bank-non Intermediation Income and the Co-movement happening between the Gold of London Gold Bullion and as well as the Brent, then the first part of the study aims to analysis the determinants of Bank-non-Intermediation Income based on evidence and data from the OIC(Organization of Islamic Cooperation) member Muslim countries. The study uses STATA as a tool to analysis the data from the OIC countries.The objective of the second part is to analysis the co-movement happening between the GOLD of London Gold Bullion in USD and the BRENT (Brent Crude Oil Price) in USD between the period of January 1986 and April 2018. The analysis is based on daily data frequency. The technique of analysis: Wavelet coherence relationship. This study ends with a concluding section which highlights the main findings of the study and suggestions.

Keywords: Determinants, Bank-non-Intermediation Income, OIC countries, Gold of London Gold Bullion, Brent.

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1. Introduction

The global financial crisis which happened since the year of 2008 has shown the complication of the financial system globally and more practically in the OIC (Organization of Islamic Cooperation) member Muslim countries, and this raised various concerns on the banking system in these countries(Malim & Masron, 2018). This concentration on the financial system probably calls for a need of bank margins as an arbitrage of financial intermediation costs. Thus, high margins reproduce high financial intermediation costs and inadequacies (López-Espinosa, Moreno, & Pérez de Gracia, 2011). In this regard various financial policies were implemented by governments in the OIC member countries and elsewhere in the world to enhance banking intermediation activities(Malatesta, Fabrizio, n.d.). Being under some high levels of competition, also the increase of the demands facing the banks from both the individual and big corporation customers for products which are sometimes more and more complex and different kind services, the focus of most of the banks was turned in fee making interests(DAMANKAH, TSEDE, & AMANKWAA, 2014). Furthermore, this study analyses the co-movement happening between the Gold of London Gold Bullion in USD and the Brent between the period of January 1986 and April 2018. The London Bullion is a well-known market located in the center of London having a global membership and client base including central banks holders of gold, private sector investors, mining companies and others(LBMA, 2016). It should be noted that due to the recent complexity of the financial markets, at both national and international levels, the investors keep looking for alternatives in their decision making. To overcome this complexity EryiGit (2017), argues that most investors especial non-professionals invest in Gold, because they look at the Gold as a simple and safe haven for many of the investors. Actually, there are three main motives which drive the demand for the Gold, these motives are the jewellery, industrial dentistry and investment(Baur & McDermott, 2010). Yet the Crude Oil (Brent) is another investment sector which has attracted the attention of many investors in the “London Bullion”. This sector is more different from the Gold investment sector which is safe haven and more liked by the investors(“Crude Oil Prices: Brent - Europe,” 2018).

2. Determinants of Bank Non-Intermediation Income: Evidence from OIC Countries

Data

Table 1: Description of variables

Variable	Description	Source
Non-intermediation Income		
B_CAP	Capitalization	Bank scope
B_ASQ	Asset Quality	
B_EFF	Efficiency	
B_LIQ	Liquidity	
B_SIZ	Bank Size	
M_CONL	Lerner index	DataStream Chinn & Ito (2006)
F_PCRB	Private Credit by Banks	
M_RINT	Real Interest Rate	
M_ECGR	Economic Growth	
M_INFDEF	Inflation (GDP Deflator)	
M_TRDO	Trade Openness	
Q_FGOV	Government Spending	
M_FINO	Financial Openness	

Empirical Results

Table 2: Descriptive statistics

	Obs	Min	Max	Mean	SD	Skew	Kurt
Non-intermed. Income	5459	-0.0078	0.4051	0.0215	0.0278	4.9348	41.3018
Capitalization	5515	1.5500	88.5900	16.5542	15.5611	2.9389	12.2669
Asset Quality	3736	0.0000	50.2500	8.5583	10.8420	2.3400	8.4212
Efficiency	5397	12.7500	217.5400	59.0733	32.2749	2.4540	11.7212
Liquidity	3948	1.0300	215.1900	34.4271	27.5634	2.9602	16.8425
Bank Size	5506	16.8521	33.1882	25.7708	3.9525	0.2228	2.3120
Lerner index	7750	-0.0136	0.5777	0.3111	0.1393	-0.0716	2.4999
Private Credit by Banks	8460	6.5400	127.2300	44.1606	29.9830	0.9088	3.0377
Real Interest Rate	6432	-10.7300	45.8100	4.8657	8.3765	1.1034	6.4523
Economic Growth	8573	-0.0814	0.1327	0.0503	0.0327	-0.5175	5.2958
Inflation (GDP Deflator)	9181	-2.9200	37.7000	9.0097	8.6024	1.2088	4.6633
Trade Openness	9066	28.1300	220.4100	86.2777	42.0651	1.1192	3.8349
Financial Openness	8458	0.0000	100.0000	52.7244	33.4298	0.1370	1.5779
Government Spending	9058	10.2000	94.9000	74.7052	12.5268	-1.1204	5.3920

Private Credit by Banks is a proxy of Financial Development of a country. Lerner Index is a proxy for bank concentration.

Table 3: Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. B_NII	1.00												
2. B_CAP	0.34*	1.00											
3. B_ASQ	0.17*	0.11*	1.00										
4. B_EFF	0.01	0.11*	0.17*	1.00									
5. B_LIQ	0.14*	0.46*	0.14*	0.10*	1.00								
6. B_SIZ	-0.06*	-0.29*	-0.08*	-0.03*	-0.16*	1.00							
7. M_CONL	0.08*	0.19*	-0.17*	-0.18*	-0.10*	-0.19*	1.00						
8. F_PCRB	-0.13*	-0.02	0.02	-0.09*	0.01	-0.20*	-0.01	1.00					
9. M_RINT	-0.01	-0.03	0.09*	0.09*	0.07*	0.02	-0.15*	-0.11*	1.00				
10. M_ECGR	0.08*	0.05*	-0.10*	-0.05*	0.06*	-0.01	0.01	-0.17*	-0.07*	1.00			
11. M_INFID	0.11*	0.02	-0.01	0.00	0.01	0.18*	-0.04*	-0.33*	-0.72*	0.14*	1.00		
12. M_TRDO	-0.00	0.14*	-0.03	-0.15*	0.04*	-0.52*	0.21*	0.68*	-0.14*	0.00	-0.22*	1.00	
13. M_FINO	-0.08*	0.09*	-0.04*	-0.15*	0.07*	-0.24*	0.19*	0.07*	0.01	-0.06*	-0.12*	0.19*	1.00
14. Q_FGOV	0.00	-0.02	-0.13*	0.10*	-0.07*	0.25*	-0.13*	-0.18*	-0.07*	0.11*	0.06*	-0.08*	-0.14*

* $p < 0.05$

To begin with, the correlation test (see Table 3) was done to see which variables were correlated to Non-intermediation income, and to know how significant those variables were. It was found that all the variables were significant except four variables. The bank efficiency was positive correlated to the Non-intermediation income, but insignificant. This simply indicates that, the higher the non-intermediation income is, the higher the bank efficiency is in cost.

On the other hand, the real interest rate was negative correlated to non-intermediation income, and insignificant at the same time. Again, the correlation between the trade openness and the non-intermediation income was negative and trade openness was also insignificant.

Lastly, the government spending was also positively correlated to non-intermediation income but insignificant which means, the government spending increases if the non-intermediation income is high.

Likewise, the test for differences in means with unequal variables (Table 4) was done to identify the efficiency of the variables. Using the t-test, the Non-intermediation Income was negative meaning, the Islamic banks are better than the conventional banks, as well as in term of bank capitalization, Islamic banks were better performing compared to the commercial banks. However, there was a high inefficiency for the Islamic banks besides the conventional banks. At the same time, the asset quality was positive and significant, which determines that the default with the conventional banks is relatively bigger in comparison with the Islamic banks. While there was no much difference between the two institutions in the bank liquidity. The bank size was positive and significant, showing that the convention banks are bigger than the Islamic banks.

Table 4: T-tests for difference in means

Non-intermediation Income	-0.006** [0.001]
Capitalization	10.571** 0.796]
Asset Quality	1.371** [0.511]
Efficiency	-5.939** [1.334]
Liquidity	-1.898 [1.961]
Bank Size	1.487** [0.158]
Observations	5515

Independent group t-tests for differences in means with unequal variances
 Standard errors in brackets

* $p < 0.1$, ** $p < 0.05$

Table 4: Estimation outputs

	POLS	FIX	RAN	FIXRobust
L.Capitalization	0.00034 ^{***} [0.00006]	-0.00005 [0.00009]	0.00022 ^{***} [0.00006]	-0.00005 [0.00014]
L.Asset Quality	0.00016 ^{**} [0.00004]	0.00009 [*] [0.00004]	0.00009 [*] [0.00004]	0.00009 [0.00010]
L.Efficiency	0.00004 ^{**} [0.00001]	-0.00003 [*] [0.00001]	0.00000 [0.00001]	-0.00003 [0.00003]
L.Liquidity	0.00000 [0.00002]	0.00005 [*] [0.00002]	0.00004 [*] [0.00002]	0.00005 [0.00004]
L.Bank Size	-0.00027 [0.00014]	-0.00488 ^{***} [0.00086]	-0.00054 [*] [0.00025]	-0.00488 ^{**} [0.00167]
Lerner index	0.00152 [0.00468]	0.01435 [*] [0.00638]	0.00765 [0.00512]	0.01435 [0.00955]
Private Credit by Banks	-0.00022 ^{***} [0.00003]	0.00005 [0.00005]	-0.00020 ^{***} [0.00003]	0.00005 [0.00005]
Real Interest Rate	0.00041 ^{***} [0.00009]	-0.00019 ^{**} [0.00007]	-0.00002 [0.00007]	-0.00019 [*] [0.00008]
Economic Growth	0.08838 ^{***} [0.01446]	0.03403 ^{**} [0.01142]	0.04969 ^{***} [0.01145]	0.03403 [*] [0.01672]
Trade Openness	0.00011 ^{***} [0.00002]	0.00009 ^{***} [0.00003]	0.00007 ^{**} [0.00002]	0.00009 ^{**} [0.00003]
Financial Openness	-0.00005 ^{**} [0.00002]	-0.00005 [0.00003]	-0.00006 [*] [0.00002]	-0.00005 [0.00003]
Inflation	0.00028 [*] [0.00012]	-0.00032 ^{***} [0.00009]	-0.00015 [0.00009]	-0.00032 ^{**} [0.00012]
Constant	0.00697 [0.00601]	0.13305 ^{***} [0.02301]	0.02657 ^{**} [0.00840]	0.13305 ^{**} [0.04427]
Observations	1268	1268	1268	1268
Time Effects	Yes	Yes	Yes	Yes

Standard errors in brackets

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

When the regression (see Table 4) was done by using the time effects, then the models were compared to know which one was reliable to use. The first comparison between Pooled OLS and Random Effects, the P-value was less than 5%, where the suggestion was to use Random Effects if the p-value is less than 5%. The second comparison was between Random Effects and the Fixed Effects, still it is said if the p-values is less than 5% to use Fixed Effects. Lastly, the Hausman test was done to judge between the two models where it is said to use Random Effects if p-value is higher than 5% and Fixed Effects if p-value is less than 5%. The Fixed Effects was found appropriate model for the analysis.

Statically, the model showed that all the bank Capitalization, Asset Quality, Bank Efficiency, Liquidity, Lerner index, Private Credit by Banks, Financial Openness are insignificant. But the Bank size had negative impact on the Non-intermediation Income, similarly the Real Interest Rate and the Inflation had negative impact on the Non-intermediation Income. On the other side, only the Economic Growth and the Trade Openness were found to have positive impact on the Non-intermediation Income.

3. Gold and Oil Co-movement Analysis

Data

Variables: *GOLD*: London Gold Bullion in USD; *BRENT*: Brent Crude Oil Price in USD

Data range: January 1986 – April 2018

Number of observations: 8417

Frequency of data: Daily

Table 1: Descriptive statistics

Statistics	BRENT	GOLD
Mean	0.005%	0.007%
Min	-15.826%	-4.413%
Max	20.470%	3.206%
S.D.	1.023%	0.422%
Kurtosis	55.44	7.58
Skewness	0.48	-0.35
Correlation	0.12	

Figure 1: Gold and oil price dynamics

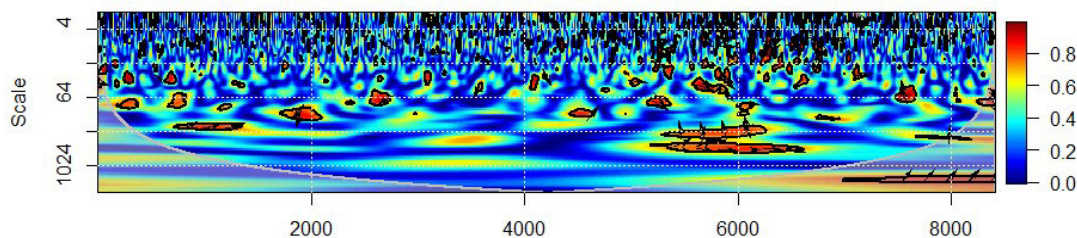


The line graphs show that around 1991, the price of Brent for the first time went over and above the price of Gold to reach almost \$1500, but there was a sudden drop in price from around \$1500 to nearly \$700. And thereafter both Gold and Brent prices moved in the same direction until 1998, when again the price of Brent started experiencing rises and went above the price of Gold to record a range of \$1300. Starting from the year of 2002, both Gold and Brent prices started fluctuating in the same range of relatively above \$1000. Then by the year of 2005, both two commodities prices were moving upwards, however the prices of Brent went up to record a number slightly more than \$2000, and remained steadied to \$3000 in the following year, whereas, the prices of Gold also moved slightly around \$1200 reaching a bit above \$2000 in the year of 2006. While almost in the same year there was a high increase in price of Brent to hit a pick almost at \$ 5200, but strangely there was a sudden significant drop in prices of Brent from \$5200 range to reach the range of \$1300 in the following years and stayed below \$2000 up to the year of 2009. Within the same period, the prices of Gold were also between \$2000 and \$3000 ranges. In the year of 2010, there was further fluctuation in the prices of the two commodities. But that of Gold this time around was above \$3000 whereas, prices of Brent remained relatively below \$3000. Thus, in the year of 2012, there was another significant jump in prices of these two commodities. For the first time, prices of the two commodities went above \$4000 with Gold experiencing higher increment. Around the year of 2015, prices of Brent started experiencing sharp decline and it continued up to 2016, when prices hit a minimal of \$1000. Although price of Gold equally experienced marginal decline in price but remained above \$3000. Thereafter, the two commodities in the year of 2017, all started experiencing rise in prices.

To sum up, one could say based on the dynamic graphs above, that prices of Brent are relatively volatile as compared to prices of Gold. Because, whenever there was a sudden price increment within the same period, the price of Brent experienced a significant drop. For instance, in the years of 2007 and 2008 which was the global financial crises period, it is clear on the graphs how much the price of Brent dramatically dropped compared to the Gold one.

Empirical Results

Wavelet Coherence: GOLD vs BRENT



The wavelet coherence test shows that in the medium run, the Gold in certain period is hedge for the Brent as in that period both two variables move in the same direction, which means that there is no causality between the two variables, rather both are influenced by a third side. Furthermore, since there is no cause and effect between the two variables, they are then moving parallelly in the same direction. The causality is when one variable is the result of occurrence of the other variable, therefore the one that causes the occurrence is the leader for the second one (Statistics, n.d.). Moving on in the same run, both two variables, Gold and Brent move in different directions up and down but there is no sign moving right or left to show any correlation between Gold and Brent, most of the times the sign is either going up or down.

4. Conclusion

In conclusion, the non-intermediation income contributes positively in the bank efficiency. This was indicated by the positive correlation between the bank efficiency and the non-intermediation income, which means that the government spending increases whenever there is a high level of non-intermediation income.

In addition, the co-movement graphs show that the Crude Oil Price (Brent) is mostly fluctuated. Its price quickly changes every time while the Gold price is almost stable all the time, it slightly fluctuates sometimes. Therefore, many investors intend to invest in Gold rather than in the Crude Oil in London Bullion.

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