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"Disruptive Innovation in Modern Business Era"

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Department of Management
FACULTY OF ECONOMICS AND BUSINESS
Universitas Muhammadiyah Yogyakarta

in collaboration with:
Universiti Sains Islam, Malaysia
Tamkang University, Taiwan
Khon Kaen University, Thailand

The 4rd International Conference on Management Sciences 2018 (ICoMS 2018)

March 28 2018

Universitas Muhammadiyah Yogyakarta, Indonesia

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Meika Kurnia Puji RDA, S.E., M.Si., Ph.D (Universitas Muhammadiyah Yogyakarta)

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Preface IcoMS 2018

The 4rd International Conference on Management Sciences 2018 (ICoMS 2018)

March 28 2018

Universitas Muhammadiyah Yogyakarta, Indonesia

Dear Presenters and Delegates,

Department of Management, Economics Faculty, University of Muhammadiyah Yogyakarta, in collaboration with the Tamkang University Taiwan, Khon Kaen University Thailand, USIM Malaysia, organized an International Conference which will be held on March 28 2018.

We are proud to know that tehre is a thick manuscript submissions came to our table for this conference. In detail, there are 42 international academic manuscripts which we received from Indonesia, Malaysia, Thailand. And in this conference we choose **Disruptive Innovation in Modern Business Era** as the main theme.

Our international conference is a manifestation of the Government of Indonesia through the Directorate General of Higher Education, which has encouraged the internationalization of research and teaching in order to foster high-caliber academic institutions globally and increase competitiveness in International Higher Education.

We are very confident that our presenters and delegates will get a lot of ideas together and experience of this conference. In addition, our participants will enjoy additional insight from our plenary session keynote speakers, namely, Prof.Dr.Shu-Hsien Liao from Tamkang University Taiwan, Dr. Kawpong Polyorat from Khon Kaen University Thailand, Prof. Dr. Syadiyah Abdul Shukor from USIM Malaysia, and Punang Amaripuja, S.E., S.T., M.IT. from Universitas Muhammadiyah Yogyakarta.

Through this conference, we are committed to promote and improve our mission and academic culture synthesize global progress with local knowledge. Therefore, it is my great honour to welcome you to IcoMS 2018 in great cultural city of Yogyakarta, Indonesia. I look forward to seeing you soon in the conference.

Best wishes,

Dr. Indah Fatmawati

Chair of IcoMS 2018

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THE DEPARTMENT OF MANAGEMENT
FACULTY OF ECONOMICS AND BUSINESS
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA
Website: www.icoms.umy.ac.id | Email: icoms@umy.ac.id
Jl. Brawijaya, Tamantirto, Kasihan, Bantul, D.I. Yogyakarta 55183
Telp. 0274–387656 ext 118 Fax. 0274–387656

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Price Discovery in Indonesia Government Bond Market

Yasir Maulana[1], Buddi Wibowo[2]

[1] Graduate Program in Management, Universitas Indonesia, Depok (yasirmau@gmail.com)
[2] Graduate Program in Management, Universitas Indonesia, Depok (wibowo_buddi@yahoo.com)

ABSTRACT

This study is try to conduct investigation about price discovery in Indonesia government bond market. Researchs and literatures in market microsttructure found that price discovery is very important to achieve return and manage risk because information is tied to price of the asset. Price discovery comprehension support investors to make better decision and more effiecient asset valuation with information. This research will cover two tier market, first tier is interdealer market and second tier is customer market. We study the dealer and customer order flow to identify which side that have greater impact in price formation in government bond market. Order flow are defined by number of trade in interdealer market and customer market. The data range is government bond transaction from year 2009 to 2014. In order to measure impact order flow to yield changes, we employ three group of maturity. Three type of yield changes bond we employ that is 3-year, 5-year- and 10-year Indonesia government securities. Three group of order flow we use to match the type of Indonesia government securities are short term-, medium-term and long-term order flow. We analyze the order flow impact with ordinary least square regression. Valseth (2012) found that aggregat interdealer flow has bigger explanatory power than aggregat customer order flow that consistent with Brand and Kavajecz (2004), Anand and Subramanyam (2008) and Osler, Ende Menkhoff (2011) that almost all research conducted in US and Europe market, so this study try to investigate in Indonesia as the emerging government bond market. So far the result is not in line with the developed countries government bond market. Except the mid term customer order flow.

Keywords: Price discovery; Order flow; Government Bond

1. Introduction

Price discovery in financial markets is very important especially in the market microstructure point of view. The importance of price discovery in price formation in the asset market can be found in Hasbrouck (1991), Brandt and Kavajecz (2004), Anand and Subramanyam (2008), Osler, Ende Menkhoff (2011), Menkveld, Sarkar and Wel (2012) and Narayan and Smyth (2015) researches that contemporary order flow shows an explanation for most daily price changes that occur in the stock market , foreign exchange markets, and government bond markets. A market microstructure view of price discovery seeks to explain that private information plays an important role in price formation. It shows that price discovery is not instantly formed based on information obtained but price discovery is formed from a process or mechanism in the collection and processing of information. The term price discovery describes the process by which the price of relevant information about the stock or other securities listed is transformed into a new price.

This study is based on the study of Siri Valseth (2012) that at the level of customer trading is much more informative than interdealer trading, dealers have better access to relevant bond information than most

customers. While at the dealer level, the results show that the dealers are heterogeneous and contribute differently in the price discovery process. Large dealer flow orders, measured by market share, have the largest impact to price.

The purpose of this study is to investigate the role of different market participants in the price discovery process in the Indonesia government bond market. The government bond market is characterized by a two-tier structure which reflects that the customer can trade with dealers only when dealers can trade either with their customers or with other dealers. The tier level to which dealers and customers trade is called the customer market and the tier level at which dealers trade with other dealers is called the interdealer market.

This study has a contribution to compare the information content of the interdealer order flow and customer order flow to examine where the market level most contribute to price discovery. Previous research used either interdealer order flow or customer order flow. Evans and Lyons (2002), Brandt and Kavajecz (2004), and Anand and Subrahmanyam (2008) use interdealer order flow from bonds, equities, and currency markets. Evans and Lyons (2005) use customer order flow from the currency market, Menkveld, Sarkar, and van der Wel (2012) using customer order flow from the bond futures market.

This paper structured as follows : 1) Introduction, 2) Literature Review, 3) Research Methodology.

2. Literature Review

Previous studies have shown that private information also contributes significantly to the discovery of prices in the US Treasury market. For example in the research Brandt and Kavajecz (2004) examined the role of private information on days without major news announcements. They found there was an imbalance of order flow reaching up to 26% day to day variation in bond yields. Using data on Treasury 5-year notes, Green (2004) shows that post-announcement order flow has a higher private information content than a day without major news announcements. Pasquariello and Vega (2007) analyzed the role of private information and public information in the process of discovery of US bond prices by simultaneously examining the bond yield response to order flow and macroeconomic news announcements. They found that private information had a greater impact on the price of bonds in the days with the spread of greater confidence among market participants. Menkveld et al. (2008) documented similar findings based on 30-year Treasury bonds. Overall, this study shows that despite valuations of US Treasury bonds. largely influenced by public information, order flow plays an important role in the process of discovery of bond prices because it combines investor private information about the assessment of Treasury securities.

Clapham and Zimmermann (2016) in his research show that the relationships between price leaders and followers remain not only during the intraday auction but also in a sustainable trade. Dunne and Li (2015) found that price discovery did not come from the same two platforms and that the stock varies according to each type of maturity period. Jiang and Lo (2014) found that Bond price changes associated with high intensity of private information flows tend to be persistent, while those associated with low intensity of private information flows tend to show otherwise. Menkveld, Sarkar and van der Wel (2012) in his research revealed that Treasury prices instantly reflect some of its effects, but intermediaries rely on their customer's order flow after the news announcement to find the full effect. Customer orderflow information is strongest when macro analyst estimates are the most widely distributed. The results apply to 30-year futures trading in the electronics market and open market. The Menkveld, Sarkar and van der Wel (2012) studies further show that intermediaries benefit from the private information flows, as their own profitability correlates with access to customer orders.

Osler, Mende and Menkhoff (2012) report that the price discovery process can not be based on improper choice between dealers and their customers, as postulated in the standard model, as spread traders citing their customers are not positively associated with trading. the information content may be This paper then highlights three factors known in the literature - fixed operating costs, market forces, and strategic transactions - which can explain cross-sectional variations in customer spreads. This paper concludes by proposing a price discovery process relevant to the liquid two-tier market and providing preliminary evidence that this process applies to currencies. Anand and Subrahmanyam's (2008) research leads to intermediaries that have greater influence on price discovery than institutional investors and other investors despite institutional investors and other investors despite starting fewer trades and volumes. Furthermore, intermediary information does not arise from inappropriate customer order handling by intermediaries. Anand and Subrahmanyam (2008) disclose these findings are consistent with a rational expectation model with noise, in which agents / dealers obtain valuable information from past prices. Intermediaries bear little or no opportunity cost to monitor market conditions, this cost efficiency which gives them a profitable trade. Lower trading costs also allow intermediaries to trade more effectively and more often by relying on their information.

All previous research conducted in developed countries with both OTC and electronics market while there is lack of researh ini emerging countries such us Indonesia. So we try to explore the empirical data in Indonesia to test if those consistent result also consistent in emerging market with growing bond market.

3. Research Methodology

3.1 Overview

This research will cover two tier market, first tier is interdealer market and second tier is customer market. We study dealer and customer order flow to identify which side that have greater impact in price formation in government bond market.

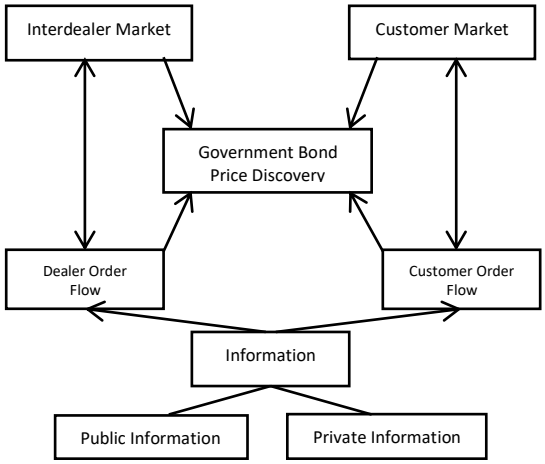

Figure 1. Research Framework

3.2 Research Method

This study is use quantitave methode with primary data with case study approach. The periode of data sample is government bond from year 2009 to 2014. In order to investigate the role of dealers in the price discovery process, we investigate the informational content of the aggregate interdealer order flow and customer order flow. If inter dealer order flow can explain daily yield changes, dealers have information relevant for future yields and play a role in the price formation process. If customer order flow can explain daily yield changes, customer trades contain information relevant for future yields. If both interdealer order flow and customer order flow can explain daily yield changes, the dealer is informed and customer trades are a source of information. If customer order flow does not explain interdealer order flow, and the dealer's interdealer order flow is informative, the dealer is informed and dealer skill can be a source of information. Indonesia government market has market maker or primary dealer that appointed by the Ministry of Finance who authorized for trading government bond in primary market then in the secondary market there is two tier market, first interdealer market an second is customer market.

Interdealer market represent by dealer order flow and customer market represent by customer order flow. Brandt and Kavazect (2004) divide order flow into six group of maturity, and Valseth (2012) divide order flow into three group of maturity. In order to measure impact order flow to yield changes, we employ three group of maturity as Valseth (2012). Three type of yield changes bond we employ that is 3 year-, 5 year- and 10 year-Indonesia government securities. Three group of order flow we use to match the type of Indonesia government securities are short term-, medium-term and long-term order flow. Short term order flow contain trades of bond with 1-4 year remaining maturity, medium term order flow contain trades of bond with more than 4-7 year remaining maturity and long term order flow contain trades of bond with more than 7-10 year remaining maturity. Three groups of interdealer order flow labelled by OF^S, OF^M and OF^L and three groups of customer order flow labelled by COF^S, COF^M and COF^L.

.The following model is used to compare the impact on the price of the aggregate interdealer order flow and the aggregate customer order flow on the Indonesian government bond market :

$$dY_t^i = c + \beta_1 OF_t^S + \beta_2 OF_t^M + \beta_3 OF_t^L + \beta_4 COF_t^S + \beta_5 COF_t^M + \beta_6 COF_t^L + e_t \quad (1)$$

where dY^i_t is the yield change of the i'th maturity from day t-1 to day t and i = 3, 5, and 10 years, c is a constant, OF^S_t, OF^M_t, and OF^L_t are short term, medium term, and long term aggregate interdealer order flow, and COF^S_t, COF^M_t, and COF^L_t are short term, medium term, and long term aggregate customer order flow on day t.

3.3 Data analysis

Table 1 display descriptive statistics for daily yield changes, interdealer order flow and customer order flow for each group in the period of Januari 2009-Desember 2014. The table inlclude all data. Yield changes are daily changes in Indonesia Government Securities index with 3 year, 5 year and 10 year of maturity.

Table 1. Descriptive Statistics

	All days			No news days		
	Mean	Min	Max	Mean	Min	Max
Yield Changes						
dY3y	-0,00229.44	-76,10	62,80	-0.13359.327	-76.10	62.80
dY5y	-0.20438.831	-72,00	66,00	-0.042678.897	-72,00	66,00
dY10y	-0,270610.092	-51,80	57,80	-0.120410.099	-51,80	57,80
Dealer Order Flow						
OF^S	4,105.216	0	42	4,05.128	0	42
OF^M	7.689.220	0	84	7,779.325	0	84
OF^L	10.7115.542	0	161	10,7815.663	0	161
Customer Order Flow						
COF^S	15,2921.707	0	641	15,3622.704	0	641
COF^M	19,8215.890	0	180	19,8315.985	0	180
COF^L	27.4928.265	0	259	27,8528.775	0	259

Table 2 shows the unconditional correlations between yield changes, interdealer order flow and customer order flow of different maturities in the period of Januari 2009-Desember 2014. Yield changes are strongly and positively correlated with each other, this correlations shows that there is large part of yield changes occurs as parallel shifts in the yield curve. The correlations between interdealer and yield changes are significant and negative for 10 year government bond, this correlations shows that positive order flow is related to higher bond prices and lower yields. The correlations between customer order flow and yield changes are negative significant for customer order flow, short term with 3 year government bond and 5 year governmend bond but weak correlations, except for long term.

Table 2. Correlations

OFS	OFM	OFL	COFS	COFM	COFL	YC_3Y	YC_5Y	YC_10Y
1,00	0,22	-0,02	0,16	0,15	-0,07	0,00	0,01	-0,01
0,22	1,00	0,08	0,13	0,36	-0,02	0,00	0,01	-0,01
-0,02	0,08	1,00	-0,05	0,08	0,70	0,02	0,01	-0,04
0,16	0,13	-0,05	1,00	0,14	-0,03	-0,01	-0,02	-0,01
0,15	0,36	0,08	0,14	1,00	0,17	-0,02	-0,04	-0,03
-0,07	-0,02	0,70	-0,03	0,17	1,00	0,02	0,01	-0,01
0,00	0,00	0,02	-0,01	-0,02	0,02	1,00	0,67	0,54
0,01	0,01	0,01	-0,02	-0,04	0,01	0,67	1,00	0,73
-0,01	-0,01	-0,04	-0,01	-0,03	-0,01	0,54	0,73	1,00

Table 3. Response of daily yield changes to aggregate order flow

	dY3y	dY5y	dY10y
OF^S	0,016	0,039	-0,009
	0,307	0,782	-0,159
OF^M	0,004	0,026	0,008
	0,126	0,900	0,246
OF^L	0,004	-0,011	-0,034
	0,157	-0,505	-1,359
COF^S	-0,003	-0,007	-0,004
	-0,260	-0,661	-0,356
COF^M	-0,013	-0,031	-0,018
	-0,721	-1,813*	-0,912
COF^L	0,006	0,013	0,009
	0,449	1,018	0,673
Adj R^2	- 0.003709	-0.000955	- 0.002230

3.4 Result

The results are presented in table 3. The table presents the results of regressing 3-, 5-, and 10- year yield changes, dY3yt , dY5yt , and dY10yt, on day t on short-, medium-,and long- term interdealer order flow, OFS, OFM, and OFL, and short-, medium, and long-term customer orderflow, COFS, COFM, and COFL, between time t-1 and time t. Order flow is measured as number of trades. The regressions are based on data for no news days. The coefficients are in basis points (0.01 percentage points). An asterisk shows that the coefficient is significant at the 10% level or better. The T-statistics are in parentheses. The table shows that aggegat interdealer order flow has no impact for daily yield changes, except for customer order flow in 5 year government bond. This not inline with Brandt and Kavaject (2004) and Valseth (2012) findings that order flow especially interdealer order flow has impact in yield changes which is that mean that in tier two or secondary market government bond of Indonesia dealer and customer are not trading with enough private information.

4. Conclusion

This research based on Indonesia Government Bond data between 2009-2014. In that range of period there is many coupon interest change from two digit into one digit, this probably can cause a missed in the research because different with developed countries the coupon interest is below 10%.

The result that two tier order flow seems not become a part of price formation, except for medium term customer order flow. This could mean that the supply and demand not reflecting information. We suggest that in next research control variable might need to reveal what the real role of interdealer order flow in the Indonesia government bond market price discovery.

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