IOSR Journal of Economics and Finance (IOSR-JEF)
e-ISSN: 2321-5933, p-ISSN: 2321-5925.Volume 10, Issue 5 Ser. III (Sep. – Oct 2019), PP 10-16
www.iosrjournals.org

CFA'S Ability to Predict Fluctuations of Indonesian Banking Bond Prices

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Abstract: *This study aims to predict fluctuations in credit interest rates, inflation rates, exchange rates, leverage, firm size, profitability and debt to asset ratio significantly influence bond prices in banking companies listed on the Indonesia Stock Exchange, both partially and simultaneously. Data from this study were obtained from the financial statements of the Go Public Property company listed on the Indonesia Stock Exchange. The sample of this study was 18 Banking Companies listed on the Indonesia Stock Exchange and data from 2013-2017. The sample was determined using a purposive sampling method. The type of data used is secondary data with media in the form of financial statements of banking companies listed on the Indonesian Stock Exchange that have been audited. The results showed that the inflation rate and leverage partially did not have a significant effect on bond prices, while DAR partially had a significant effect on bond prices in banking companies listed on the Indonesia Stock Exchange. Inflation, leverage, and DAR levels simultaneously have a significant effect on bond prices in Banking companies listed on the Indonesia Stock Exchange*.

Keywords: *Credit Interest Rate, Inflation Rate, Exchange Rate, Leverage, Company Size, Profitability, DER and Bond Prices*

Date of Submission: 12-09-2019 Date of Acceptance: 30-09-2019

I. Introduction

There are two types of investments that must be known, such as investment in real assets and investment in financial assets. Investment in financial assets is the type of investment most often carried out by investors because it is generally intangible but still has a high value. The example of financial assets traded on the stock exchange is bond. A bond is divided into two types, government bonds, and corporate bonds. Corporate bonds are bonds issued by state-owned companies or private companies. Broadly speaking the bonds are proof of debt from the issuer (bidders) guaranteed by the insurer which contains promises of interest payments or other pledges as well as repayment of the loan principal made on the due date. The main reason many investors are interested in bonds because bonds provide a fixed return for a relatively long period and are not affected by interest rate fluctuations. Also, investors want security over the capital they invest through high-quality bonds (Dendawijaya, 2010).

The interest rate factor is very influential on the rise and fall of bonds. Interest rates rise and fall all the time, and if interest rates change, the value of bonds that are circulating also fluctuates. Interest rates can and do indeed increase, and rising interest rates cause loss of value for bondholders. So, people or companies that invest in bonds face risks that arise from changing interest rates. If the interest rate does not remain constant, the bond price will fluctuate. Thus, an increase in interest rates will cause the price of bonds that are still circulating down, while a decrease in interest rates will result in bond prices rising (Abdullah, 2011). This is by the expectation theory where investors will expect a high rate of return if there is an increase in interest rates in the future. Therefore, high demand from investors will cause bond prices to move down.

Bond prices and interest rates always move in the opposite direction. When the interest rate rises, the value of bonds, like other present values, will decrease. Similarly, when the interest rate falls, the value of the bond will rise. Even if there is a bond that without risk, in the sense that the borrower is certain to make all payments, there is still a risk of having a bond (Abdullah, 2011).

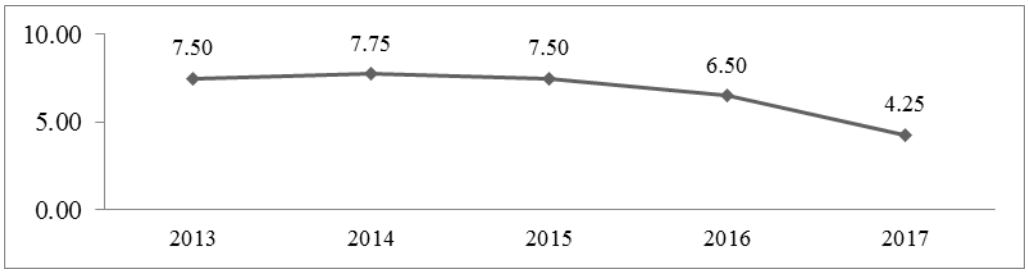

Figure 1. Interest Rate

Figure 1 describes the development rates of interest rates in 2013-2016, where the development rate of interest rates decreased in 2015 by 7.50%, in 2016 amounted to 6.50% and in 2017 amounted to 4.25% from the previous year, this would impact on decreasing interest rates, the bonds will decline.

Kasmir (2010) states that inflation risk will cause a decrease in the real value of money or income. In the context of bond investment, an increase in inflation will cause a decrease in the real value of interest income obtained by investors during the life of the bonds. The bond market will generally be attractive if economic conditions tend to decline. In slow economic growth, the interest rate will tend to fall, and bond prices will rise. In economic conditions that have increased inflation, interest rates will tend to increase. The inflation rate will affect the market interest rate, and then the interest rate will affect prices and bonds. Therefore, the bond market does not like an increase in inflation which can hurt the real value of fixed income derived from bonds.

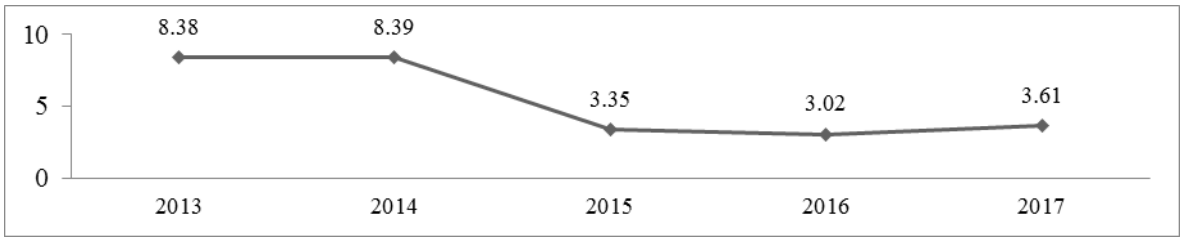

Figure 2. Average Inflation Rate

Figure 2 explains that the development rate of the inflation rate in 2013-2016, where the average development rate of inflation increased in 2014 by 8.39% and 2017 by 3.61% from the previous year, this will have an impact on the decline in bond prices. Changes in exchange rates can directly influence bond prices even though the SBI rate is fixed. Only at a certain amount to maintain economic competitiveness, the monetary authority corrects the size of the SBI rate which is usually followed by commercial banks in general. So it can be said that the change in the exchange rate of Rp / $ can directly cause changes in bond prices and indirectly through changes in interest rates (Lubis, 2010).

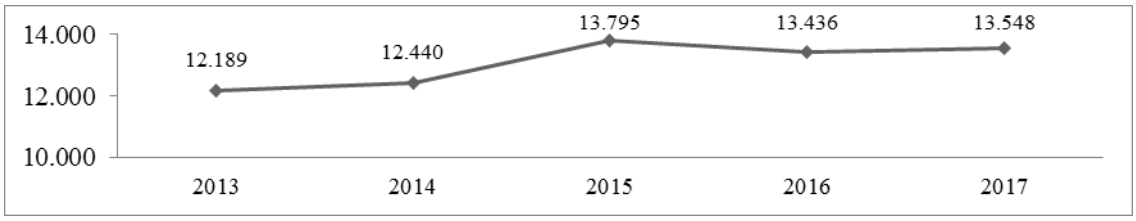

Figure 3. Average Exchange Rate

Figure 3 explains the average exchange rate development in 2013-2016, where the rate of development of exchange rates experienced an increase in 2014 amounting to Rp.12,440, in 2015 amounting to Rp.13,795 and in 2017 amounting to Rp.13,548 from the previous year, this would cause changes in bond prices. Companies that have high debt ratios face a higher risk of loss during a recession, but the expected rate of return is also higher in bright times. Conversely, companies with low debt ratios are not at great risk, but the opportunity to double returns on equity is also small. Certainly, the prospect of a high rate of return will be desired, but investors are reluctant to face risks. Therefore, companies need to find a balance between the rate of return and the level of risk (Taswan, 2010).

II. Theoretical Review

Nowadays bonds as one of the debt capital traded start to attract many companies as an alternative source of funding. According to the Republic of Indonesia Presidential Decree No.775 / KMK / 001/1982 (Soemarsono, 2010), bonds are a type of securities in the form of debt instruments for loans from people in certain forms, for a period of at least three years with promises of sums of interest and when the payment has been determined in advance by the issuer. According to Warsono (2013), bond issuance can be viewed from two sides, namely from the issuer and from the investor side. In terms of issuers, bond issuance is one alternative funding other than bank loans or loans. One of the main objectives of the issuer's company to issue bonds is to increase the value of the company, because the cost is relatively cheap compared to the emission of new shares, with the consequence of the greater financial risk. From the investor side, bond issuance is a safe investment alternative. Because bonds provide a fixed income in the form of interest coupons which are paid regularly with competitive interest rates and principal debt that is paid on time at a predetermined maturity.

According to Soemarsono (2010), Bonds based on the Issuer. Treasury Bonds. Government bonds are bonds issued by the government to finance economic development. These bonds have a long maturity. A range of 25 years is a bond on behalf of, cannot be withdrawn and given tax facilities. Government bonds usually have a lower interest rate coupon which will certainly provide a lower yield to maturity (YTM). However, the level of risk is virtually non-existent. This is because the bonds are fully guaranteed by the government, so there is little chance of default. Agency Bonds. Institutional bonds are bonds issued by government-owned institutions, such as state-owned enterprises, government projects, and others. Even though it is not guaranteed by the government, it receives support from the government and obtains tax facilities — municipal Bonds. Regional government bonds are bonds issued by Level I, Level II, and other government agencies. The main characteristic of this type of bond is tax exemption — corporate Bond. Company bonds are bonds issued by a company or company to meet the capital structure. Corporate bonds are attractive because they provide relatively high coupons. The general nature of these bonds is interest paid in the middle of the year, issued as a term bond with one maturity, maturity between 20 to 30 years with deferred withdrawals after five years. Institutional Bond (Institutional Bond). Institutional bonds are bonds issued by various non-profit private institutions, such as schools, hospitals, and bodies or charitable foundations.

III. Methodology

Furthermore, factor analysis is carried out, aimed at detecting new dimensional factors that are by the criteria (Rusiadi; Subiantoro, & Hidayat, 2014), using the formula:

$$Xi = Bi1\ F1+Bi2\ F2+Bi3\ F3+Bi4\ F4 + Bi5\ F5+Bi6\ F6 + ...+ Vi\mu i$$

Where:

Xi = The I standardized variable
Bij = Partial regression coefficient for variable I on the common factor to j
Fj = Common factor to i
Vi = Standardized regression coefficient for i-variable in the unique factor to i
µi = Unique variable factor to i

Test criteria: factors are stated to be the dominant factor if they have a component coefficient of matrix> 0.5. Specifically for Factor Analysis, a number of the following assumptions must be fulfilled:

1. Correlation between Independent variables. Correlation or correlation between independent variables must be strong enough, for the example above 0.5.
2. Partial Correlation. The magnitude of the partial correlation, the correlation between two variables by assuming that the other variables remain, must be small. In SPSS, detection of partial correlation is given through the choice of Anti-Image Correlation.
3. I am testing all correlation matrices (correlation between variables), measured by the amount of Bartlett Test of Sphericity or Measure Sampling Adequacy (MSA). This test requires a significant correlation between at least several variables.

IV. Result and Discussion

Descriptive statistics provide a description or description of a data that is seen from the number of samples, the minimum value, the maximum value, the average value (mean value), and the standard deviation of each variable.

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Interest Rate	90	1.45	2.05	1.8780	.22381
Inflation	90	1.11	2.13	1.5720	.46137
Exchange Rate	90	2.50	2.62	2.5700	.05008
Leverage	90	-2.53	7.20	5.8296	1.89115
Company Size	90	2.77	3.21	2.9603	.11625
Profitability	90	-2.41	2.03	.4556	.85569
DAR	90	-4.61	5.71	3.4251	2.49277
Bond Price	90	6.22	11.19	7.9284	1.93106
Valid N (listwise)	90				

Table 1 describes the variable interest rate minimum value of 1.45, a maximum of 2.05, the mean of 1.8780, and the standard deviation is 0.22381. The inflation variable minimum value is 1.11, the maximum is 2.13, the mean is 1.5720, and the standard deviation is 0.46137. The exchange rate variable is a minimum value of 2.50, a maximum of 2.62, a mean of 2.5700 and a standard deviation of 0.05008. The minimum leverage variable is -2.53, the maximum is 7.20, the mean is 5.8296, and the standard deviation is 1.89115. Company size variable minimum value is 2.77, the maximum is 3.21, mean is 2.9603, and the standard deviation is 0.11625. The profitability variable minimum value is -2.41, a maximum of 2.03, the mean is 0.4556, and the standard deviation is 0.85569. The DAR variable minimum value is -4.61, the maximum is 5.71, the mean is 3.4251, and the standard deviation is 2.49277. The bond price variable is a minimum value of 6.22, a maximum of 11.19, the mean is 7.9284, and the standard deviation is 1.93106, with a total of 90 data.

Tabel 2. Communalities

	Initial	Extraction
Interest Rate	1.000	.833
Inflation	1.000	.906
Exchange Rate	1.000	.928
Leverage	1.000	.833
Company Size	1.000	.707
Profitability	1.000	.524
DAR	1.000	.833

Extraction Method: Principal Component Analysis.

Table 2 explains that the results of the extraction show individually all variables stated to have contributions that exceed 50% or 0.5. But further feasibility must be tested with an explained variance.

Table 3. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**2.808**	**40.109**	**40.109**	**2.808**	**40.109**	**40.109**	**2.053**	**29.330**	**29.330**
2	**1.526**	**21.795**	**61.905**	**1.526**	**21.795**	**61.905**	**1.932**	**27.602**	**56.932**
3	**1.230**	**17.572**	**79.476**	**1.230**	**17.572**	**79.476**	**1.578**	**22.544**	**79.476**
4	.870	12.432	91.908						
5	.356	5.082	96.990						
6	.183	2.607	99.597						
7	.028	.403	100.000						

Extraction Method: Principal Component Analysis.

Table 3 explains the results of the total variance explained; it is known that only three components of the variable that become factors influence the price of bonds. Eigenvalues show the relative importance of each factor in calculating the variance to seven variables analyzed. From the table above it can be seen that there are

only 3 factors formed, because the two factors have the total value of eigenvalues still above 1, that is the value of 2,808 for factor 1, the value of 1,526 for factor 2 and the value 1,230 for factor 3, so the factoring process should stop in three factors only or two variables that will participate in the next analysis.

Table 4. Rotated Component Matrix

	Component		
	1	2	3
Interest Rate	.331	.849	.050
Inflation	**.903**	.298	-.041
Exchange Rate	-.903	-.334	.024
Leverage	.111	**.892**	.162
Company Size	-.017	.052	-.839
Profitability	.547	-.386	.274
DAR	.030	.254	**.876**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Table 4 shows that the three factors are the most optimal number so that it can be seen in the component matrix table. The process of determining which variable will go into which factor is done by making a large comparison of the correlation on each row. Based on the results of the component matrix values, it is known that from 7 factors, the feasible ones to influence stock prices are three factors that come from inflation, leverage, and DAR. So that the OLS equation model in this study was formulated:

$$\mathbf{Y = \alpha + ß_1X_1 + ß_2X_2 + ß_3X_3 + €}$$

Where:
Y = Bond Prices *(Dependent Variabel)*
α = Constant
ß = Multiple Regression Coefficient (*Multiple Regression*)
X_1 = Inflation (*Independent Variabel*)
X_2 = *Leverage* (*Independent Variabel*)
X_3 = DAR (*Independent Variabel*)
e = Error term

Table 5. Multiple Linear Regression

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	**(Constant)**	**7.667**	.849		9.033	.000
	Inflasi	**-.174**	.458	.042	.379	.705
	Leverage	**-.116**	.120	-.113	-.961	.339
	DAR	**-.193**	.088	.250	2.204	.030

Column coefficients can be arranged in multiple linear regression equations as follows:

$$Y = 7{,}667 - 0{,}174\ X_1 - 0{,}116\ X_2 - 0{,}193\ X_3 + e$$

The interpretation of multiple linear regression equations is:
a. If everything in the independent variables is considered non-existent, the bond price (Y) is 7,667 thousand.
b. If there is an increase in inflation of 1%, the bond price (Y) will decrease by 0.174 thousand.
c. If there is an increase in leverage of 1%, the bond price (Y) will decrease by 0.116 thousand.
d. If a DAR increase of 1%, the bond price (Y) will decrease by 0.193 thousand.

The method used is to see the level of significance (= 0.05). If the significance value is smaller than 0.05, then H0 is rejected, and Ha is accepted.

Table 6. Simultaneous Test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.052	3	6.017	6.649	.004[a]
	Residual	313.829	86	3.649		
	Total	331.881	89			

a. Predictors: (Constant), DAR, Inflasi, Leverage

b. Dependent Variable: Harga Obligasi

Based on table 6 above, it can be seen that F-count is 6.649 while Ftable is 2.48, which can be seen at α = 0.05 (see attachment table F). Significant probability is much smaller than 0.05, which is 0.004 <0.05, so the regression model can be said that in this study inflation, leverage and DAR simultaneously have a significant effect on bond prices. Then the previous hypothesis is to Accept Ha, or the hypothesis is accepted. The results show that t-count is 0.379 while t table is 1.987 and is significant at 0.705, so t-count is 0.379 <ttable 1.987 and significant is 0.705> 0.05, then Ha is rejected and H0 is accepted, which states that inflation does not significantly influence bond prices. Effect of leverage on bond prices. The results show that t-count is -0.961 while t table is 1.987 and is significant at 0.339, so t-count -0.961 <ttable 1.987 and significant 0.339> 0.05, then Ha is rejected and H0 is accepted, stating leverage does not significantly influence bond prices. The results show that t-count is 2.204 while t table is 1.987 and is significant at 0.030, so t-count 2.204> t-table 1.987 and significant 0.030 <0.05, then Ha is accepted and H0 is rejected, which states DAR has a significant effect on bond prices.

Table .7 Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	**.233[a]**	**.454**	**.421**	**1.91028**

a. Predictors: (Constant), DAR, Inflasi, Leverage

b. Dependent Variable: Harga Obligasi

Based on the table seen the coefficient of determination of 42.1% shows that 42.1% of the information contained in the data can be explained by the model, while the rest is 100% - 42.1% = 57.9% explained by errors and other variables outside the model. Based on data analysis and hypothesis testing that has been done in this study, it can be seen that inflation is proven to have no significant effect on bond prices. The research is by Sukanto's (2015), Karlina (2014), Kurniasih (2015), Sanjaya and Situmorang (2017) research, that inflation is proven to have no significant effect on bond prices. This study states that inflation risk will cause a decrease in the real value of money or income.

Based on data analysis and hypothesis testing that has been done in this study, it can be seen that leverage proved to have no significant effect on bond prices. The research is by Sukanto's (2015), Karlina (2014), Kurniasih (2015), Sanjaya and Situmorang (2017) studies, that leverage proved no significant effect on bond prices. This study states that companies that have high debt ratios face a higher risk of loss during the recession, but the expected rate of return is also higher in bright times. Conversely, companies with low debt ratios are not at great risk, but the opportunity to double returns on equity is also small. Certainly, the prospect of a high rate of return will be desired, but investors are reluctant to face risks. Therefore, companies need to find a balance between the rate of return and the level of risk (Taswan, 2010). Leverage in this study is measured by the Debt to equity ratio (DER), which reflects the ratio of debt to equity owned by the company. This means that this ratio shows the relationship between the number of long-term loans given by creditors with the amount of their capital provided by the owner of the company. Taswan (2010) added that companies with relatively high debt ratios have higher returns in normal economic situations.

Based on data analysis and hypothesis testing that has been done in this study, it can be seen that DAR proved to have a significant effect on bond prices. This study states that Debt to Asset Ratio (DAR) Debt to Asset Ratio is a ratio to measure the number of assets financed by debt. This ratio is also very important to see the solvency of the company. Companies with relatively high debt ratios have a high risk. With the use of debt, the greater the risk, the higher the risk of not being able to pay the debt. The higher this ratio (DAR), the greater the risk faced, and investors will ask for a higher level of profit. So it can be concluded that the high DAR ratio will indicate the higher risk of company defaults in the future so that it will have an impact on the high yield of corporate bonds.

DAR does not affect bond yields. This means that the decrease and increase in debt to equity ratio does not affect the yield to maturity. This is because companies that have a larger size or business activities that require larger capital expenditure tend to require higher debt financing. Companies that have large sizes tend to have large total assets. This shows that the company reaches maturity (mature) stage wherein this stage, the company has positive cash flow and has good stability and prospects in a relatively long period. When the company's business activities are at maturity (maturity), the debt to equity ratio will reach its peak. At this stage, the company's profits are quite high, and the tax burden is also relatively high, so the company chooses alternative funding through debt to reduce the amount of tax.

V. Conclusion

Inflation and leverage levels partially have no significant effect on bond prices, while DAR partially has a significant effect on bond prices in Banking Companies Listed on the Indonesia Stock Exchange. Inflation, leverage, and DAR levels simultaneously have a significant effect on bond prices in Banking companies listed on the Indonesia Stock Exchange.

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Tohap Parulian. "CFA'S Ability to Predict Fluctuations of Indonesian Banking Bond Prices." IOSR Journal of Economics and Finance (IOSR-JEF) , vol. 10, no. 5, 2019, pp. 10-16.