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The Fed Model For Vocational Higher Education: A Concept and an Urgency

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Abstract

This article aimed to verify the theory of the fed model and its urgency so that it is worth studying for the vocational education students. There are three indicators as variables that can claim that a theory is worthy to be studied or not, namely, norms of correspondence, norms of coherence, and norms of pragmatic. The research model used was one sample t-test for each variable. The result of this study shows that the fed model is feasible to be studied because it is in line with the real situation in industry, it's coherent with the previous theory, and has many benefits for fund managers, investors, and students.

Keywords: theory, the Fed model, capital market, stock–bond correlation

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1. Introduction

The current theory in capital market analysis is still very limited to the information of any investment instrument. However, based on research from Bekaert, Engstrom, and Grenadier (2010), there is a dynamic relationship between stock prices and bond prices returns among Moody's investors. Baur & Lucey (2009) also stated that flights between stocks and bonds and contagion among them are exists especially during crisis. One potential cause of this simultaneity is cross-country transmission. If flight-to-quality is a common feature in periods of crisis in various countries, stock markets go down simultaneously and bond markets are increasing simultaneously. Therefore, in conducting analysis in the capital market today, it requires a theory that can analyze all investment instruments simultaneously.

The discovery of theory basically starts from the problems or phenomenon that need to be analyzed. Hansen (1977:16) states that theory is structure upon which the information central to a solution of problem that can be placed. Then, Wolman (1973) in Hansen (1977:16) expressed that theory as system of empirical data derived from observation and/or experimentation, and of their interpretation. Thus, it can be

concluded that theory is a set of information or hypotheses from experts which have been tested several times on how to solve the problem [1].

One of the most recent theories in the capital market industry to conduct capital market valuation is The Fed Model. This approach is slightly different from the other theories. The Fed Model offer investors to valuate market based on yield from stock market and from bond market. This model firstly written on Humphrey–Hawkins report released by Federal Reserve on 1997. The report states that the changes of price ratio in S&P 500 have been inversely related to long-term treasury yields changes. The report also shows a close relationship between price ratio and treasury yields during 1982–1997. Ed Yardeni, an analyst at Deutsche Morgan Grenfell, took a cue from the report, named the relationship as with Fed's Stock Valuation Model and published several reports using that model to evaluate the level of stock market [2].

This model argues that there is an equilibrium relationship between the earning yield of stock index and the 10-year government bond yield. The basic idea of this model derived from stock–bond yield relationship theory. In a simple arrangement, when the earnings yield is below (above) the 10-year government bond yield, the stock market is supposed to be overvalued (undervalued). Thus, the fair value for the stock index should be equal to the earnings level divided by the prevailing 10-year government bond yield.

Campbell and Vuolteenaho (2004) said that the Fed Model has been quite successful as an empirical description of stock prices. The use of this model by some people felt more benefits than other valuation models because it's easy to apply. Fund managers can invest in the highest yielding asset both in the equities or in the bonds to diversify their risk of investment. Also, this model is broadly in line with the discounted present value of future cash flows principle. However, the Fed Model has some weakness, mainly because it suffers from theoretical shortcomings and the changes from earning yields are sometimes not accompanied by changes on bond yield. then, the equilibrium point between earning yields and 10-year government bond yield cannot be achieved [3].

The use of the fed model for capital market analysis has not been studied in lectures. In fact, this model is simpler and more suitable for vocational education. Vocational program is an applied educational program with one of its purpose is to create middle competent experts in their field. Therefore, the curriculum was designed based on the competencies required by industries and related professional associations. Curriculum development always should be done not only for the interest of the business world, but also in order to find the best competencies of the vocational prospective graduates

that have linkage to the needs of the employment world. Job market challenges with a very high demand from industry, insisting Vocational Program to be able of producing graduates by utilizing the existing capabilities.

The quality of vocational education in terms of process and product are greatly influenced by subjects contained in the course. Campus should continue to update their curriculum to keep up with trends in the industry. Dynamic state of industry makes practical theories more emerging to replace theories that already exist in the curriculum. This condition must necessarily be captured by vocational education since their program is more practical than theoretical. Hence, this article will discuss about the urgency of the Fed Model theory in order to answer the demand of vocational education in the capital market industry.

2. Literature Review

2.1. Theory

According to Kerlinger (1973: 9), theory is a series of assumptions, concepts, constraints, definitions and propositions to explain social phenomena systematically by formulating relationships between variables. Based on that definition, the definition of theory contains three things. First, theory is a series of propositions between interrelated concepts. Second, the theory systematically explains several social phenomena by determining the relationship between concepts. Third, the theory explains certain phenomena by determining which concepts relate to other concepts and how they relate [4].

Sarlito W. Sarwono (2004:7) suggested that theory may be decent or not is not determined by its content, but by several norms as follows: [5]

1. Norms of Correspondence, that is, how far the theory fits with the facts. The more suitable, the better the theory is.

2. Norms of Coherence, which includes the following 2 measures:

   (a) How far the theory fits with previous theories. This doesn't mean that a theory should not contradict with one or two previous theories. Yet, although the theory is at odds with certain theorists, a good theory still fits with a number of other theories

   (b) Simplicity, the theory is not complicated, not convoluted, easy to understand. Simplicity consist of the following 2 things:

i. Descriptive, which is simplicity in the description of the theory

ii. Inductive, which is simplicity in the procedure of conclusion (induction) from the existing data.

3. Norms of Pragmatic, that is, how far the theory has practical uses. The greater its usefulness, the better theory is concerned.

2.2. Stock–Bond correlation

Stock–bond correlations are at the core of many financial decisions such as problems related to risk management and the optimal of financial assets allocation. Also, this theory is the basic theory of The Fed Model. In stock–bond relationship, the growth rate and discount factor variables are interrelated in the valuation formula. Rising interest rate are not necessarily a bad thing for the stock market outlook, which was already suggested by Modigliani and Cohn (1979) [3].

Several researches nowadays are more focus on the determinant of stock–bond relationship. David & Veronesi (2004) and Li (2002) based on their research show that the uncertainty from macroeconomic factors (especially expected inflation) has significant predictive power with the covariance and correlation of stock–bond returns [6]. Yang, Zhou, and Wang (2009) shows that stock–bond correlations during recessions are lower than during expansions in the US. By contrast, the higher correlations occur during recessions than during expansions in the UK.

2.3. The Fed Model

According to Maoi (2013), the Fed Model postulates that stocks and long-term bonds are competing assets in the portfolios such as pension funds, and the earnings or dividend yields on stocks should be approximately equal to the yields on nominal bonds in the long-run, or at least should be strongly correlated.

The Fed Model posits an equality between the forward earnings yield of the stock market (E/P) and the 10-year government bond yield (Y), as follows: [7]

$$\frac{E}{P} = Y$$

The idea behind that formula is when E/P > Y, stocks yield more than bonds and are therefore relatively more attractive. Conversely, when E/P < Y, stocks yield less than bonds and are therefore relatively less attractive.

Abbott (2000) suggested that the Fed Model is not intended to provide a precise valuation for the market. Rather, he argues that the model should be thought of as providing a 'fair value range' with boundaries of $\pm 10\%$, which is called as valuation gaps. Valuation gaps (relative departures from the equality) within the $\pm 10\%$ range are 'reasonable' deviations that should not necessarily lead to corrections in prices [2].

3. Hypothesis

In order to improve the quality and integrity of the vocational education curriculum, campus need to understand what is the current theory which being talked about in the industry. However, the theory itself sometimes does not fit with the other theorem rather reflects the actual situation.

There are a lot of pro and cons about the application of the Fed Model so far. Still, we can't deny that there is a dynamic correlation between stocks and bonds that may be useful to investment decision.

Theory can be categorized good or bad is depending on several norms that have been put forward by Sarwono (2004). When the Fed Model is statistically proven to be a good theory, then the theory is feasible to be studied by students in Vocational Higher Education. So that, the hypothesis of this research is as follows:

Hypothesis 1

H_1: There is norm of correspondence in The Fed Model

Hypothesis 2

H_2: There is norms of coherence in The Fed Model

Hypothesis 3

H_3: There is norms of pragmatic in The Fed Model

Hypothesis 4

H_4: The Fed Model is worthy of being studied by Vocational Higher Education students.

4. Methodology

This study uses a quantitative approach. The data was carried out in two ways, literature study and field study. Literature study is based on books and other journals to support the theory that being use in this research. meanwhile, field study is based on primary data using survey approach. This approach is being used to describe quantitatively the trends, attitudes, or opinions from particular population by providing questionnaires to the respondents in the field.

This research takes a good theory indicator according to Sarlito W. Sarwono (2004) because his theory is mostly consistent with this research. Good theory consists of 3 norms that can be used as indictors in this study, namely; (a) norms of correspondence, (b) norms of coherence, and (c) norms of pragmatic (see appendix 1).

4.1. Population and sample

Population in this study is capital market professionals from several securities companies and asset management companies. Sampling technique is using simple random sampling, which is the simplest technique because sample is taken randomly, doesn't count the population level, and each element of the population has the same chance to be selected as subject.

To determine the size of the sample, this study used Taro Yamane formula as follows:

$$n = \frac{N}{Nd^2 + 1}.$$

Where,

n = number of samples

N = number of populations

d = precision value (% tolerance level toward improper use of the sample)

Using 10% as precision value, then the sample size is:

$$n = \frac{50}{50(0.1)^2 + 1}$$

$$n = 33 \text{ sample}$$

4.2. Research model

Univariate analysis is used to see the mean difference of sample statistics. This parametric test can describe the significant difference between the explanatory variables. *T*-test is used to validate the test results [8].

Hypothesis for *t*-test is:

$$H_0 : \mu \neq \mu_0$$

$$H_1 : \mu = \mu_0$$

This study using one-tailed *t*-test. In order to interpret the *t*-test value, there are several steps that need to be done, that is:

1. Determine the alpha (α) significance value and the degree of freedom (D_f), using the formula as follows:

$$d_f = N - 1$$

2. Counting the *t*-count value which, formula as follows:

$$t_{count} = \frac{\overline{x} - \mu_0}{s/\sqrt{n}}$$

Where:

t = value of *t*-count.

$\overline{x}$ = sample average.

μ_0 = parameter value.

s = sample standard deviation.

n = number of samples.

3. Compare the *t*-count value with the *t*-table value $\left(t_{tab} = t_{\frac{\alpha}{2}, N-1} \right)$, the interpretation of this calculation is if the $t_{count} > t_{table}$, then significantly H_0 is rejected.

5. Result

This research is based on Sarwono (2004) concept of good theory, so that the plot will be the same. However, to get the conclusion of the urgency of the Fed Model for Vocational Higher Education, there are 3 norms that must be met. So that, hypothesis testing is preceded by testing the 3 norms first.

5.1. Norms of correspondence

It measures how far the Fed Model fits with the actual condition. Based on data processing, the result is stated as follows:

TABLE 1: Output of norms correspondence.

One-sample test				
Sub-variables	Test Value = 4			
	t	df	Sig. (2-tailed)	Mean
BIRATE_POS_RTRNEQ	−4.030	30	0.000	3.5484
INF_POS_RTRNEQ	−3.981	30	0.000	3.5161
DPR_POS_RTRNEQ	−3.981	30	0.000	3.5161
BONDPR_NEG_BONDYLD	−3.503	30	0.001	3.6129
BONDCP_POS_BONDYLD	−7.114	30	0.000	2.6129
BONDMTR_NEG_BONDYLD	−8.192	30	0.000	2.7419
BONDTYP_POS_BONDYLD	−9.422	30	0.000	2.9355
STOCKBONDCORR	−7.473	30	0.000	3.2903
STOCKBONDCORR_NEG	−6.670	30	0.000	2.8387
SBC_BIRATE	−6.036	30	0.000	3.4516
SBC_INF	−6.864	30	0.000	3.1935
Source: Author, 2017.				

Using t-test analysis, null hypothesis from the first hypothesis is significantly rejected. It can be concluded based on:

1. t_{table} for norm of correspondence variable is $t_{(0,05,30)}$ = 0.68276. From Table 1, t_{count} for each sub-variable is greater than 0.68276.

2. sig (2-tailed) < α, or 0.000 < 0.05.

From that points, we can reject the null hypothesis and accept the alternative hypothesis. In other words, there is norm of correspondence in the Fed Model.

The average mean of each sub variables are greater than 2, it means that respondents are 'agree' with statements presented in questionnaire. The lowest mean is sub-variable 'bond coupon has positive correlation with bond yield'. This statement is to verify that our respondents are understand the differences between bond coupon and bond yield. The highest mean is in sub-variable 'BI Rate has positive correlation

with equity return'. This statement is to verify that all the respondents have basic knowledge in capital market.

Based on hypothesis test results, it can also be concluded that the theory is in line with the actual conditions in the capital market. This can be proven from the respondent's answers which are entirely practitioners who have been certified professionally in the capital market. In the capital market, economic factors such as BI rate and inflation play an important role for making investment decisions. Meanwhile the correlation between the stock market and bonds also turned out to be consideration by market players in making investments.

5.2. Norms of coherence

Norm is measured how far the theory fits with previous theory and the complexity of the theory. Simpler a theory, the better theory is. Data processing show as follows:

TABLE 2: Output of norms of coherence.

One-sample test				
	Test Value = 4			
	t	df	Sig. (2-tailed)	Mean
ANFUND_STCK	−9.287	30	0.000	3.2581
ANDDM_STCK	−3.057	30	0.005	3.7097
YTC_GOVBOND	−7.725	30	0.000	2.7742
YTM_GOVBOND	−6.892	30	0.000	3.3871
SBC	−10.384	30	0.000	2.4194
SBC_FM	−12.553	30	0.000	2.6129
PER_NEG_GOVYLD	−12.692	30	0.000	3.0968
EY_NEG_PER	−18.447	30	0.000	2.8710
VG_RANGE_STOCKBOND	−10.782	30	0.000	3.0000
VG_RANGE_10	−12.209	30	0.000	2.7097
EY_HIGHER	−10.142	30	0.000	3.2258
Source: Author, 2017.				

Using *t*-test analysis, null hypothesis from the second hypothesis is significantly rejected. It can be concluded based on:

1. t_{table} for norm of correspondence variable is $t_{(0,05,30)}$ = 0.68276. From Table 2, t_{count} for each sub-variable is greater than 0.68276.

2. sig (2-tailed) < α, or 0.000 < 0.05.

From that points, we can reject the null hypothesis and accept the alternative hypothesis. In other words, there is norm of coherence in the Fed Model. It means that the Fed Model is fits with the previous concept, such as fundamental analysis, yield to maturity, stock–bond correlation, etc. Moreover, surprisingly the test result shows that the Fed Model measurement, namely earning yield and valuation gaps are easy to understand.

The average mean of each sub-variable are greater than 2, it means that correspondents are 'agree' with the statement presented in questionnaire. Statement "I understand about stock–bond correlation" in sub-variable has the lowest mean, 2.42. This can be interpreted that respondents have not much knowledge about stock–bond correlation. However, respondents are quite understand about the concept contained in stock–bond correlation theory. The stock–bond correlation theory is the innovation from existing concept, such as PER, DDM, and YTM.

5.3. Norms of pragmatic

Norm of pragmatic explained about how far the theory has practical uses. The more useful, the better theory is. The result of data processing is stated as follows:

TABLE 3: Output of norms of pragmatic.

	One-sample test			
	Test Value = 4			
	t	df	Sig. (2-tailed)	Mean
EQRTRN_CAPMAR	−5.064	30	0.000	3.3548
BONDRTRN_CAPMAR	−2.683	30	0.012	3.8065
SBC_CAPMAR	−6.892	30	0.000	3.3871
SBC_DIVPORTO	−2.683	30	0.012	3.8065
SBC_ASSETALL	−4.224	30	0.000	3.4516
SBC_FACTOR_CAPMAR	−12.692	30	0.000	3.0968
Source: Author, 2017.				

Using *t*-test analysis, null hypothesis from third hypothesis is significantly rejected. It can be concluded based on:

1. t$_{table}$ for norm of correspondence variable is $t_{(0,05,30)}$ = 0.68276. From Table 2, t$_{count}$ for each sub-variable is greater than 0.68276.

2. sig (2-tailed) < α, or 0.000 < 0.05.

Regarding to those aforementioned calculations, we can reject the null hypothesis and accept the alternative hypothesis. Statistically we may conclude that there are norms of pragmatic in the Fed Model. We can use the Fed Model to make capital market valuation, portfolio diversification, and also asset allocation.

Unlike the other norms, norms of pragmatic have fairly higher mean value than norms of correspondent and norms of coherence. The average mean of each sub-variable are greater than 3, which means that correspondents are 'strongly agree' with the statement presented in questionnaire. Statement "bond return has correlation with capital market" and "Stock-bond correlation is useful for portfolio diversification" have the greatest mean, 3.81. To conclude, respondents argues that learning about the Fed Model has benefits to create efficient asset allocation and others.

5.4. The urgency of the fed model for vocational higher education

The main core of the vocational education curriculum is how to keep the curriculum up to date with situations in the industry. In the previous curriculum, capital market analysis is still done based on investment instruments only. Along with the development of research in investment management field, several studies show that there is a correlation between stocks and bonds which affects investment decisions and asset allocations for both fund managers and investors. This is particularly important considering that efficient asset allocation issue in portfolio diversification theory is still the most often topic to be discussed.

Based on several approaches in assessing stock and bond relationships, the Fed Model approach is the most applicable approach. However, this approach is still much debated whether this approach is worth studying or not. The result of hypothesis test 1–3 states that the norms that occur in good theory measurement according to Sarwono (2004) significantly found in theory of Fed Model. However, to reassure the feasibility of this theory, we will test simultaneously the average of each norm in hypothesis test 4. Here is the following result of hypothesis test 4:

TABLE 4: Good theory variables.

One-sample test			
	Test Value = 4		
	t	df	Sig. (2-tailed)
Norm of Correspondence	−11.920	30	0.000
Norm of Coherence	−32.442	30	0.000
Norm of Pragmatic	−8.124	30	0.000

Source: Author, 2017.

Based on the results of hypothesis 4, the result is null hypothesis can be rejected so that alternative hypothesis can be accepted. This is evident from the significance value is lower than alpha (0.05) and the t_{count} value is greater than 0.6872 (t_{table} value). So it can be concluded that the theory of the Fed Model is a good theory to be studied by the students because it has met the norms of good theory according to Sarwono (2004).

6. Conclusion

To conclude, good theory has to meet 3 norms, namely norms of correspondence, norms of coherence, and norms of pragmatic. Norms correspondence shows that the Fed Model is in line with the actual conditions in the capital market. Norms of coherence is used to assess whether the theory is in line with previous theories and quite simple to understand.

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