Determinants of Stock Investment Decision through Skill and Knowledge Financial: An Analysis with Partial Least Squares Approach

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Abstract: This study aims to examine the factors affecting stock investment decisions through skill and knowledge finan. variables on stock investors in the existing investment gallery at state universities in north sumatera, expressed comprehensively with component-based structural equations, Partial Least Square (PLS). PLS is an analytical method that is not based on many assumptions. In the PLS is not required multivariate normal assumption, can use the scale of nominal, ordinal, interval and ratio measurements and sample size should not be large. PLS estimates the relationship model between latent variables and latent variables with indicators. Based on the results of the analysis obtained the conclusion that the largest total influence data are financial capability variables to decision variables, as well as the largest direct effect of financial competence variables to investment decisions.

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1 INTRODUCTION

Investment plays an important role in driving economic growth and employment in Indonesia. In accordance with Law No.8 of 1995 on capital market has a strategic position in national economic development. Students as young people are expected early on to have knowledge in managing their finances in order to have a more prosperous life in the future.

Research on the factors that influence stock investment decisions involves several variables. The variables used are latent variables that can not be measured directly. This process allows the testing of a relatively complex set of relationships simultaneously, so that required analytical techniques that can accommodate all the variables with either the structural equation modeling or Structural Equation Modeling. There are two models of structural equations that can be applied into a research that is Covariance Based Structural Equation Modeling (CBSEM) and Component Based Structural Equation Modeling or known as Partial Least Square (PLS). Partial Least Square is an analytical method that is not based on many assumptions such as does not have to be multivariate normal distribution and the sample size does not have to be large.

2 LITERATURE REVIEW

2.1 Financial Competence

Education in the English dictionary means education, whereas according to Sugihartono (2007), education comes from the word educating which means nurturing and forming exercises. Financial knowledge has a close relationship with financial litercay or financial education. Financial knowledge can be channeled and can be understood well through financial education or financial literacy.

Fernandes (2014) through his research is known that financial education becomes very important for increasingly complex financial decisions at the present moment, and known a close relationship between financial education with financial literacy and financial behavior. Later, Yoshino and Wignaraja (2015) stated in the results of his research that financial literacy in Asia is still very limited and can be overcome with appropriate financial education programs and promote financial education

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intensively to increase financial literacy in Asia. Lusardi (2008) stated in his research that financial education can improve saving habits and make better financial decisions.

2.2 Financial Capability

Soekanto (Abdulsyani, 2007) states that social status is the place of a general person in a society that deals with others in his or her social environment, its prestige, rights and obligations. Soekanto (2017) states that the socio-economic status means the position of an individual and family based on economic elements. Soekanto (2017), mentions the factors that affect one's social economy in society that is the size of the wealth, the size of honor, and the size of science.

Ali et.al. (2016) stated in the results of his research that the economic background of parents, especially the work of parents does not affect the financial literacy of students. While Fowdar (2007) stated in the results of his research that the students' financial literacy is influenced by the background of parents and family. Gumus and Dayioglu (2015) stated that their socioeconomic status and demographic factors influence investors' perceptions of risk with different background income levels, it is also known that the age-gender-level education-income-profession of investors influences the perceptions of risk and decision investment taken.

2.3 Skill and Knowledge Financial

Literacy comes from English literacy which means the ability to read and write. The concept of literacy is not only synonymous with the literacy of a person, but also against the technology of computer literacy, in the financial field known as financial literacy. Some definitions of financial literacy are:

1) Financial Literacy is the mastery of knowledge and ability (skills) to make rational economic and financial decisions with full confidence and competence (Working Group on Financial Literacy, 2010).
2) A combination of awareness, knowledge, skills, attitudes and behavior necessary to make sound financial decisions and achieve individual financial well-being (INFE-OECD, 2011). As part of the science of finance, financial literacy is a person's ability in personal finance that includes money management, spending and credit, savings and investments (Hananto, 2011).

Ali (2013) stated in his research results that financial literacy provides the knowledge and ability to make good decisions, good decision-making ability will make the customer able to achieve prosperity.

2.4 Decision of Stock Investments

Tandelilin (2010) states that investment is a commitment to a number of funds or other resources that are done at this time, with the aim of obtaining some benefits in the future. Investment decisions as decisions that have an important role for financial management, and also have a big role in the development / growth of the business or even the development of a country. Meanwhile, according to Manurung (2012) investing is basically 'buying' an asset that is expected in the future can be 'resold' with a higher value.Some reasons someone make an investment decision (Tandelilin, 2010):

1) A worthy life in the future
   The beginning of investment is excess funds from investors. The excess funds come from personal funds and loan funds. These advantages are then invested for future benefits.
2) Reducing inflationary pressure
   Investing in the ownership of a company or other object impacts the investor's self-evasion from the risk of impairment of property or property rights due to the influence of inflation.
3) The urge to save on taxes.
   Provision of tax facilities to people who invest in certain business sectors encourage the growth of investment in the community.

An investment plan needs to be thoroughly analyzed. An investment plan analysis is basically a study of whether or not a plan can be successfully implemented.

2.5 Partial Least Square (PLS)

In the PLS analysis it is necessary to know whether the data meets the requirements for the SEM PLS model. Some characteristics that need to be considered include, sample size, shape of data distribution, missing values, and measurement scale. Researchers should pay attention to how much of the missing data is in the data. In addition, the measurement of endogenous latent variables should not use a nominal scale so that the model can be identified.

Hair et al. (2013) states that the minimum sample size guidance in SEM-PLS analysis is equal to or greater (≥) of the following conditions:

1) 10 times the largest number of formative indicators used to measure a construct.
2) 10 times of the largest number of structural paths leading to a particular construct.

The guideline is called the 10 X rule (10 time rule of thumb) which is practically 10X of the maximum number of arrows (paths) that pertain to a latent variable in the PLS model.

This guideline is still rough guidance so that Hair et al. (2014) suggests researchers to use the Cohen (1992) approach that considers statistical power and effect size when determining the minimum sample size. As preview at Table 1, the determination of the sample size using the Cohen (1992) approach in Haryono and Wardoyo (2013) if the maximum number of arrows on a construct is 10, the 5% significance level and the minimum R-square 0.25 the minimum sample size is 91.

Table 1. Sample Size Determination Table In PLS

Jumlah maksimal arah panah menuju konstruk	Tingkat (*level*) Signifikansi											
	1%				5%				10%			
	Minimum R^2				Minimum R^2				Minimum R^2			
	0,10	0,25	0,50	0,75	0,10	0,25	0,50	0,75	0,10	0,25	0,50	0,75
2	158	75	47	38	110	52	33	26	88	41	26	21
3	176	84	53	42	124	59	38	30	100	48	30	25
4	191	91	58	46	137	65	42	33	111	53	34	27
5	205	98	62	50	147	70	45	36	120	58	37	30
6	217	103	66	53	157	75	48	39	128	62	40	32
7	228	109	69	56	166	80	51	41	136	66	42	35
8	238	114	73	59	174	84	54	44	143	69	45	37
9	247	119	76	62	181	88	57	46	150	73	47	39
10	256	123	79	64	189	91	59	48	156	76	49	41

Source: Cohen 1992 (in Haryono and Wardoyo, 2013)

Data analysis technique

The data collected in this research will be analyzed quantitatively by using SEM - Partial Least Square (PLS) method as follows:

1) Estimation Parameter SEM - Partial Least Square (PLS)
   The path analysis model of all latent variables in the PLS consists of three sets of relationships:
   a. Inner model that specifies the relationship between latent variables (structural model).
   b. Outer model that specifies the relationship between latent variables with indicators or variables manifestasinya (measurement model).
   c. Weight relation, to assign a score or calculate latent variable data.
2) Steps of the model equation model of structural equations with SEM-Partial Least Square (PLS) In this research, data analysis on SEM-PLS will use SmartPLS software support.
   a. Obtains concept-based models and theories to design structural models (relationships among latent variables) and their measurement models, ie relations between indicators with latent variables.
   b. Creating a path diagram (diagram path) that explains the pattern of relationship between latent variables with the indicator.
   c. Convert the path diagram into the equation.
   d. Conduct goodness of fit evaluation by evaluation of measurement model (outer model) by looking at validity and reliability. If the measurement model is valid and reliable then it can be done next step that is evaluation of structural model. If not, then it should re-construct the path diagram.
   e. Model interpretation.

3 RESEARCH METHODOLOGY

This study uses primary data. Primary data was obtained from questionnaires distributed by email to all stock investors in investment gallery at public university in North Sumatra in 2018 (University of Sumatera Utara, State University of Medan, UINSU, Medan State Polytechnic). The sample size used is 100. The sampling technique used is non-probability sampling with accidental sampling, ie the sample is selected based on the ease in obtaining the required data.

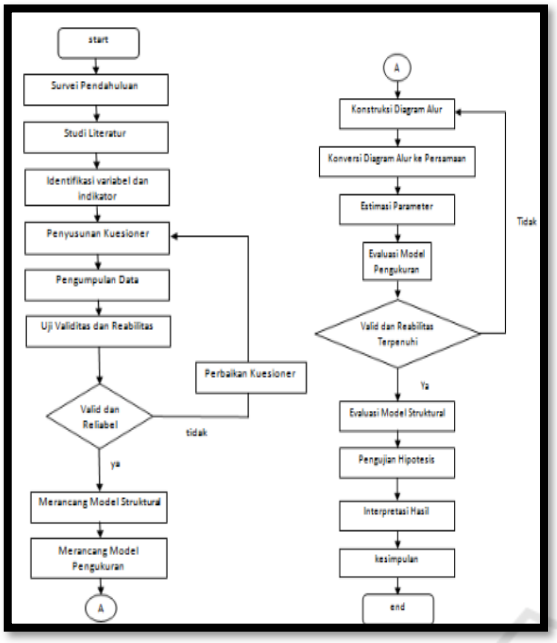

Figure 1. Flow Chart of research

4 RESULT AND DISCUSSION

4.1.Convergent Validity

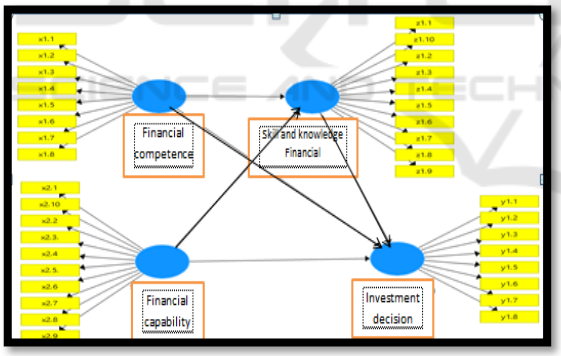

Figure 2. Theoretical Model Development Diagram
Source: PLS Output of research data (2018)

Convergent validity with reflexive indicator is valid if it has loading value with latent variable to be measured> 0.70, if one indicator has loading value <0.70 then the indicator should be discarded (drop) because it will indicate that indicator is not good enough to measure the latent variables appropriately (Ghozali and Latan, 2015). Here is the output of structural equation path diagram of PLS using SMART-PLS software.

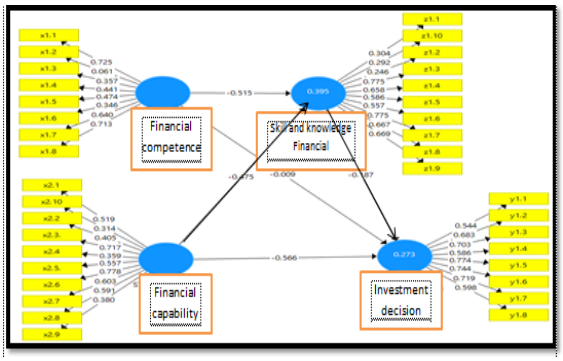

Figure 3. Output Diagram
Source: PLS Output of research data (2018)

Indicators whose value loading factor <0.70 is derived from the model because it is considered less able to measure well the construct variable. The model that formed after the issued several invalid indicators are as follows:

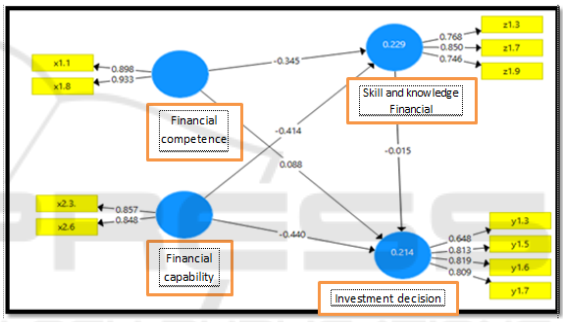

Figure 4. Modified Output Diagram
Source: PLS Output of research data (2018)

4.2. Test Validity and Reliability

In this research, validity test and test result with all values of r> r-table (with df = 30-2 = 28 and 5% significance, that is 0,374) so it can be concluded that all items of statement are valid. Next Test reliability by looking at Alpha Cronbach value. A latent variable is said to be reliably if the value is> 0.6. Obtained information that all variables have values> 0.6 which means all variables are very reliable. Obtained latent variable score as follows:

Table 2. Value Composite Reliability

	Reliabilitas Composite
Financial competence	0,912
Financial capability	0,842
Skill and knowledge financial	0,832
Investment decision	0,857

Source: PLS Output of research data (2018)

Based on Table 2. Composite Reliability value obtained information that the value of Composite Reliability on all blocks of indicators has met the assumption Composite Reliability is greater than 0.6 means that the indicator blocks in each latent variable has a high consistency.

Discriminant validity with reflexive indicator can be seen on cross loading between indicator with its construct, indicator correlation value to its construct must be bigger than other construct value. Another method of assessing discriminant validity is to use Average Variance Extracted (AVE) which has a construct value> 0.50 specified as a good model (Ghozali and Latan, 2015). Visible on the AVE table the terms of construct value> 0.50 have been met, so it can be said that the model is a good model.

Table3. Average Variance Extracted (AVE)

	Average Variance Extracted (AVE)
Financial competence	0,839
Financial capability	0,727
Skill and knowledge financial	0,623
Investment decision	0,601

Source: PLS Output of research data (2018)

4.3 Path Significance Test

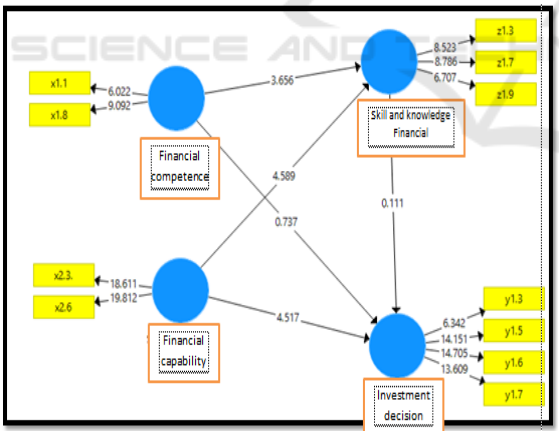

Figure 5. Bootstraping Structural Model

Source: PLS Output of research data (2018)

The coefficient value of the structural model is said to be significant if the t-count> t-table is 1.96 (1.96 is the t-table value in the 95% confidence level). All the indicators in Figure 5 look significant on the condition of t-value> 1.96.

4.4 R-Square

Inner model or structural model testing is done to see the relationship between construct, significance value and R-square of the research model. The structural model is evaluated by using R-square for the t test dependent construct as well as the significance of the structural path parameter coefficients.

To assess the model with PLS begins by looking at R-square for each dependent latent variable. The following table is the result of R-square estimation.

Table 4. R-Square

	R-Square	Adj. R-Square
Skill and knowledge financial	0,229	0,213
Investment Decision	0,214	0,190

Source: PLS Output of research data (2018)

Q-Square predictive relevance for the structural model, measuring how well the observation value is generated by the model and also its parameter estimation. The Q-square value > 0 indicates the model has predictive relevance otherwise if the Q-square value ≤ 0 shows the model lacking predictive relevance.

Q-Square predictive relevance

= 1- (1-Rsqure1)(1-Rsquare2)

= 1 – (0,771)(0,786)

= 1 – 0,606 = 0,394

Table5. Outer Model (Weights of Loading)

	Financial competence	Invest decision	Skill and knowledge	Finan. capability
x1.1	0.4907			
x1.8	0.5992			
x2.3.				0.5945
x2.6				0.5779
y1.3		0.3865		
y1.5		0.2451		
y1.6		0.3407		
y1.7		0.3354		
z1.3			0.4344	
z1.7			0.4406	
z1.9			0.3913	

Source: PLS Output of research data (2018)

Table outer model describes the relationship between latent variables with the indicator that is:

1) X1.1 (gain knowledge of various products / financial services) has a relationship of 0.4907 to financial competence

2) X1.8 (gain skills in managing benefits, risks, cost of products / financial services) has a relationship of 0.5992 to financial competence
3) X2.3 (work) has a relationship of 0.5945 to financial capability
4) X2.6 (income) has a relationship of 0.5779 to financial capability
5) Y1.3 (understand personal financial condition) has a relationship of 0.3865 to the investment decision
6) Y1.5 (understand financial records) has a relationship of 0.2451 to the investment decision
7) Y1.6 (understand financial records) has a relationship of 0.3407 to the investment decision
8) Y1.7 (understand the time value of money) has a relationship of 0.3354 to the investment decision
9) Z1.3 (risk) has a relationship of 0.4344 to skill and knowledge financial
10) Z1.7 (portfolio analysis) has a relationship of 0.4406 to skill and knowledge financial
11) Z1.9 (risk-level relationship with return) has a relationship of 0.3913 against skill and knowledge financial

Based on that interpretation, it can be analyzed that the overall view has the greatest value among all relationships ie x1.8 (gain skills in managing benefits, risks, cost of products / financial services) to the financial competence variable of 0.5992.

The fourth indicator (obtaining skills in managing the risk benefits, product cost / financial services) of this financial competence variable is a variable that must be done so that the financial competence process on the investor can run well. Based on the above information it can be said that all latent variables in this study have a relationship less than 50% which means all latent variables in this study have a weak relationship / small.

Table 7. *Path Coefficient*

	Financial competence	Invest decision	Skill and knowledge	Finan. capability
Finan. competence		0.0884	-0.3448	
Investment decision				
Skill and knowledge		-0.0152		
Financial capability		-0.4396	-0.4142	

Source: PLS Output of research data (2018)

Table path coefficient explain the influence of latent variables are:

1) Financial competence has the effect of 0.0884 on investment decisions
2) Financial competence has a -0.3448 effect on skill and knowledge financial
3) Financial capability has a -0.4396 influence on investment decisions
4) Financial capability has a -0.4142 influence on skill and knowledge financial
5) Skill and knowledge financial has an influence of -0,0152 against investment decision

Mapping the Influence between Variables

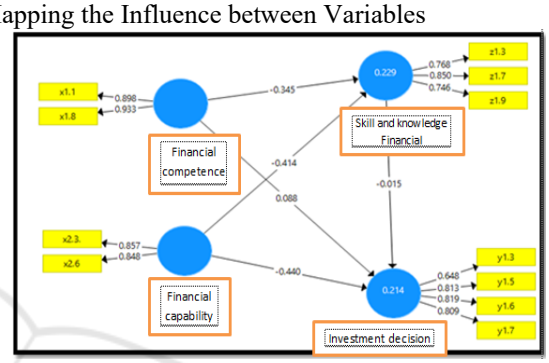

Figure 6. Inflation Diagram Variable Variables

Source: PLS Output of research data (2018)

Table 8. Intergroup Influence Mapping

	Direct influence	Indirect influence
f. competence➔skill and knowledge f.	Yes	No
f. competence➔Decision	Yes	Yes (via condition)
finan.capability➔skill and knowledge f.	Yes	No
finan.capability➔Decision	Yes	Yes (via condition)
skill and knowledge f.➔Decision	Yes	No

Source: PLS Output of research data (2018)

Table 9. Direct Influence, Indirect Effect, and Total Influence

	Direct influence	Indirect influence	Total influence
f. competence➔skill and knowledge f.	-0,345	No	-0,345
f.competence➔Decision	0,088	(-0,345) x(-0,015)	0,005

		= 0,005175	
finan.capability➔skill and knowledge f.	-0,414	No	-0,414
finan.capability➔Decision	-0,440	(-0,414) x (-0,015) = 0,00621	0,006
skill and knowledge f.➔Decision	-0,015	No	-0,015

Source: PLS Output of research data (2018)

In the table looks the largest total data influence of financial capability variables to decision variables. The biggest direct effect of financial competence variables to investment decisions.

5 CONCLUSION

5.1 Conclusion

Based on the exposure described in the analysis and discussion chapter, it can be concluded that:
1. The largest total influence data is the finan. capability variable to the decision variable.
2. The largest direct effect of financial competence variables to investment decisions.

5.2 Suggestion

Statistically, the number of results obtained in this study is relatively small because it is only limited to the theory, so need more deepening of each factor by doing individual research and also required other comparator factors.

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