Smart Beta in Index Country ASEAN

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***Abstract* -** **The corona virus epidemic threatens the world which causes many people to die and destroys the global economy with a decline in a number of indexes in the ASEAN region. The stock indexes in the ASEAN region selected in this study include Indonesia, Malaysia, Singapore, Thailand, Philippines, and Vietnam with the 2004-2020 period, then try to add other investments such as gold investment, which will be combined into the optimal portfolio. Portfolio determination is based on the smart beta model by performing smart calculations with the help of Beta, Alpha, and Value at Risk (VaR) methods. The results of this study indicate that a portfolio formed with smart beta by combining a number of ASEAN stock indices and gold investment during the study period with equal weight on each index and gold will produce a high rate of Return with a low level of risk when compared to a portfolio without there is a mixture of other investments in other words, only the ASEAN index is in the portfolio. In conditions of economic crisis coupled with the corona virus outbreak, investors are advised to be careful in choosing stocks or indexes to be included in the portfolio, it is advisable to switch to types of investments that are safer against crises such as gold investment.**

Keywords: ASEAN, Portfolio Optimal, Smart Beta

1. INTRODUCTION

The health crisis occurs due to the corona virus originating from China which threatens the health of the world community, many have died from the corona virus so that each country limits human traffic in and out of the country in other words Lock Down in every region that has high cases of corona virus transmission. In the end, it is not only health that is threatened by this corona virus, but relations between fellow communities will be tenuous and prevent socialization like it was before this virus occurred. This research will discuss more about the effects of corona in the economic sector, in more detail in the investment sector stock exchange. How the impact of the corona virus on investment in the Association of Southeast Asian Nations (ASEAN) index. This research will photograph the data for January 2004-October 2020, to see the development of the index in ASEAN countries, you can see in Figure 1:
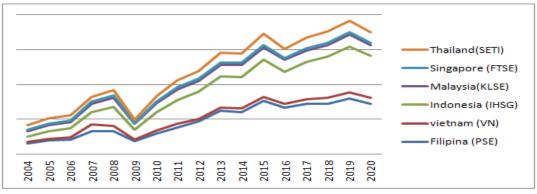

Figure 1: The Movement of Return Index Stock ASEAN

In Figure 1, it is known that from early 2004 all indexes of ASEAN countries, including Indonesia, Malaysia, Singapore, Thailand, Philippines, and Vietnam, have increased despite the crisis in 2008,

however the index price has improved again by showing positive growth every year. but in 2020 the index has decreased quite deeply, do not know how long this graph will reverse the direction as happened in 2009 to 2010, so the need for investors to think in determining what types of investment can be done in current conditions, the research offers designing optimal smart beta portfolios with the help of the Beta method, which sees how much market risk affects stock price movements, where the greater the beta level of a stock /index, the risk of the stock/index will follow the market, then the alpha function, which is useful for knowing how much superior rate of Return generated by stocks/index compared to the market, then the last function, Value at Risk (VaR), this function can find out how much the risk level of individual stock price/index movements in a certain period. Portfolios are very feasible to use because with the lowered risk portfolio can be diversified, Markowitz (1952) then developed portfolio research by researchers Sharpe (1964), Lintner (1965), and Mossin (1969) offering a Capital Asset Pricing Model (CAPM).

A number of researchers who tested CAPM using econometric techniques that produce accurate beta such as Scholes and Williams (1977) Dimson (1979), Fowler and Rorke (1983), and Cohen et al (1983). Optimizing the mean-variance is a good tool for making optimal portfolios by efficiently channeling some of the investor's assets into several types of investment, according to the expected Return. Michaud (1989), Canner et al. (1997), Simaan (1997). As time went on, researchers began to find derivatives of the Markowitz formula where the term smart beta appeared by considering beta to design portfolios such as Amenc and Goltz (2013), Cazalet et al (2014), Davis (2015), Alford et al (2017), then use The VaR method is also carried out in calculating the risk of individual stocks such as researchers, Hammoudeh et al (2013), Gogajeh et al (2015), Rizal et al (2018), Borri (2019).

Many of the models offered by researchers include researchers who examine optimal portfolio design in the ASEAN region such as in Indonesia Hendrawan and Salim (2017), Salim (2019), Salim et al (2020), and Hendrawan et al (2020). in Indonesia there are those who research about smart beta with variables beta, alpha, diversification, and VaR, Salim et al (2020). Then the research also carried out diversification in the sector for the formation of portfolio investment in Malaysia Mohamad et al (2006), the use of Dual Beta on the Malaysian stock market, Teh et al (2017) Lee et al (2019) examined that portfolio design can be done in all crisis periods. depending on investors to design and allocate portfolio funds, research is also examined on the ASEAN index, where the exchanges in the ASEAN region studied on 5 exchanges are integrated with each other, Endri (2010), Click and Plummer (2003), Puspitasari et al (2015) researching on the stock exchanges of Indonesia, Malaysia, Singapore, Thailand, and Philippines) then this research adds to the Vietnam stock exchange and gold investment to enter as part of the optimal portfolio. So it is necessary to design an optimal portfolio that is useful to anticipate the effects of the corona virus on investment, especially in the ASEAN region. In Figure 2, it can be seen from the Return on each index each year.
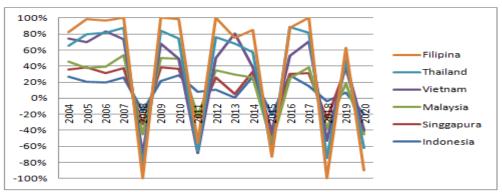

Figure 2: Return Index Stock ASEAN

In Figure 2, it shows a decrease in the Return of each index in 2008, 2011, 2015, 2018, and 2020, this data indicates that every time there is a crisis marked by a decrease in the index together, the decline is a market response. investors will be anxious about the economic conditions in that year, but every time a

decline occurs, there will be a reflection for economic improvement, which is indicated by an increase in Returns in the following year after the crisis. With the economic crisis conditions that will weaken the enthusiasm for investment by investors, the researchers try to offer a model for the formation of optimal portfolios with smart beta on indices in the ASEAN region and combine gold investment into an optimal portfolio.

2. LITERATURE RIVIEWS

2.1 Portfolio

A portfolio is a combination of a group of assets that are combined into one, the portfolio theory itself was introduced by Markowitz (1952) with the famous journal *Portfolio Selection* which became the forerunner to the optimum portfolio theory which discusses how to select one or more optimum assets that provide the highest Return rate with a certain level of risk and the lowest risk with a certain rate of Return. Portfolio theory has been used in financial instruments such as stocks and bonds. Portfolio theory is also applied to physical goods such as capital goods investment budgeting (Capital Bugedting). Then the portfolio developed and the emergence of the Asset Pricing Model (CAPM) was introduced by Sharpe (1964) and Lintner (1965) where this theory is based on Markowitz's portfolio theory (1952) where portfolio theory develops implications for investors' decisions in choosing assets to be combined into portfolios with consider the Return and risk, then consider the level of risk free assets where investors have the same opinion that investment is able to beat risk free asset Returns. CAPM has the advantage that beta is a key factor in the application of CAPM theory. CAPM offers an effective measurement by measuring the relationship between expected Return and the level of risk that will be faced, the risk that will be faced is known as Beta**.**

2.2 Management portfolio

Managing a portfolio there are two strategies that can be used, first is a passive strategy where fund management is done to replicate the market index, the proportion of shares is carried out with the same weight, where investors follow the movements of the market index, but the passive strategy does not need to change the portfolio composition too often because it considers / avoid transaction fees that will arise due to these changes. There are several considerations that must be considered in managing a passive portfolio, including:

1. To buy shares with the same proportion as the index.

2. Hold.

3. Mathematically, the number of portfolio shares will not be more than the index. For better results, check the historical index on the number of shares.

4. Determine the smallest asset class of the stock and some characteristics such as sector, index, industry, and capitalization size.

Active portfolio management, the composition of the shares in the portfolio changes periodically for the future according to the calculations carried out today. There are three things that must be considered in designing an active portfolio, namely, market timing, sector selection and price stability of individual stocks. Market timing is based on the predicted beta of the portfolio, according to the ranking of the proportion of share weight and the funds invested in each of these stocks.

2.3 Smart Beta dan Alpha, VaR

Smart beta is usually used by ETF products to be used as a strategy to manage funds in order to get an optimal portfolio, where a security/mutual fund has various strategies to maximize Returns in order to get a high alpha value on managed investments, managers are competing - competition to get a positive alpha so that the managed funds provide Returns to investors who invest in these securities. The more sophisticated the beta strategy that is implemented, the higher Returns will be with certain risks. Alpha is used to measure the performance of investment managers that can produce portfolio Returns that exceed the Returns obtained by the market. So alpha is the difference between the actual Return obtained and the expected Return, the higher the alpha value of a security, the investment managers have succeeded in

making investors invest more and more in these securities due to the good performance the investment manager has made in these securities.

The use of VaR to measure the level of risk that exists in a portfolio is different from the risk of individual stocks, if there is only one stock, the risk level / single variant is high and different from if a number of stocks have many different risks, the risk will be diversified and tend descended by itself.

3. METHODOLOGY

This study uses a quantitative method by using the Return index ratio for each calculation. The population in this study consisted of the Association of Southeast Asian Nations (ASEAN) composed of 10 countries including Indonesia, Malaysia, Indonesia, Malaysia, Singapore, Thailand, Philippines Vietnam, Brunei Darussalam, Vietnam, Laos, Myanmar, and Cambodia. The sample selection was carried out by selecting the 5 largest index in the ASEAN region composed of Indonesia, Malaysia, Singapore, Thailand, Philippines, and Vietnam and added with the type of gold investment which is useful for designing a mixed portfolio. Then this study tries to offer 2 optimal portfolios, namely the first portfolio containing 6 stock indexes in the ASEAN region, the second mixed portfolio where choosing the best 5 indices and adding gold investment, after these two portfolios are formed which one is better compared to the best portfolio Return. with a certain level of risk.

The observation period was carried out from January 2004 to December 2020, with this long period of time it is expected to be able to photograph many events that occur in the investment world, especially stock investment. Risk Free is used is the interest rate of The FED because all banks in the world refer to The FED for the benchmark bank interest rate in each country. The greater the interest rate of The FED, developing countries such as countries in the ASEAN region will raise bank interest rates in each country because rational investors will usually seek higher Returns than lose opportunities to get more Returns. Risk Free becomes the benchmark rate for measuring expected Return, if the Return obtained by a stock / index is below the risk free value, the expected Return on an investment will not occur. The following are a number of calculations that will be carried out, including:

Calculate the Return of each index. $\text{Ri} = \frac{(\text{R1} - \text{R0})}{\text{R1}}$ 1

Calculate the expected Return. $ERi = \text{Ri} - \text{Rf}$ 2

Calculate the standard deviation. $s = \sqrt{\frac{\sum_{i=0}^{n}(x1 - \bar{x})^2}{n-1}}$ 3

Calculate the varians (VaR) $\sigma^2 = \sum_{i=1}^{n}\frac{(R_{it} - E(R_i))^2}{n}$ 4

Calculate the Beta $\beta_i = \frac{\sigma_{im}}{\sigma_{m^2}}$ and the Alpha $\alpha_i = E(R_i) - \beta_i . E(R_m)$ 5

Calculating the amount of weight on each index. $Wi = \frac{the\ asset\ value\ of\ the\ portfolio\ i}{the\ asset\ value\ of\ all\ the\ assets\ in\ the\ portfolio}$ 6

Calculate the expected Return of the portfolio $E(Rp) = \alpha p + \beta p * E(Rm)$ 7

Portfolio risk $\sigma p^2 = \beta p^2 .\sigma m^2 + (\sum_{i=1}^{n} w_i . \sigma ei)^2$ 8

Performance of Sharpe portfolio $\text{Sp} = \frac{\text{Rp} - \text{Rf}}{\sigma p}$ 9

The smart beta model offered for index selection is based on the Markowitz model with $E(Ri) = Rf + \beta * (Rm - Rf)$ and develop into the addition of the alpha method and VaR will become $E(Ri) = Rf + \beta * (Rm - Rf) + a * (Rm - Rf) + VaR * (Rm - Rf)$ this model can be used to predict the selection of indexes to be included in the portfolio, if the Markowitz model only uses beta to determine the expected Return index / stock, however the Beta, Alpha, and VaR (BAV) models can predict the expected Return from various sides, among others, from market risk, market Return and individual risk index / stock, there

are many considerations that can be obtained to choose an index in order to achieve an optimal portfolio for investors.

4. RESULTS and DISCUSSION

The index taken in this study are based on the 5 largest stock markets in ASEAN, namely the indexes of Indonesia, Singapore, Malaysia, Vietnam, Thailand and Philippines. Table 1 shows the Return and risk of each index where the Vietnam stock exchange was 20.3% during 2004-2020 with the greatest risk level of 14%, this result supports the theory of Hight Return Hight Risk. Furthermore, the optimal portfolio was formed using the CAPM method, and Smart beta, alpha, VaR and then carried out the Sharpe test to test the performance of each ASEAN index.

Table 1: Return and Risk Index

Country	Return	Risk
Indonesia (IHSG)	18.7%	5%
Singapore (FTSE)	5.5%	4%
Malaysia (KLSE)	6.1%	2%
Vietnam (VN)	20.3%	14%
Thailand (SETI)	6.4%	5%
Philipphines (PSE)	13.5%	4%

Source: N/A

CAPM testing is widely carried out by researchers in the world, among others (Banz (1981) and Reinganum (1981), then Keim (1983) then there is the development of the CAPM theory where the advantage is the beta method (market risk), but Smart Beta, Alpha, and Value at Risk (VaR), which was inspired by Cazalet et al. (2014) to form a portfolio by considering Beta (market risk), the risk of individual stocks against market risk, the greater the beta value of a stock, the risk of the index will follow market risk, then Alpha (market Return) Alpha index value is used to see how much the Return index can be above the market Return, and VaR is used to measure the level of volatility, the higher the volatility level of the index price, the higher the individual risk of the index, then it can be measured by VaR.

Table 2: Performance of ASEAN Index

Country	CAPM	B.A.V
Indonesia	0.002706	0.00277
Singgapore	0.003295	0.00331
Malaysia	0.001513	0.00153
Vietnam	0.003716	0.00380
Thailand	0.002884	0.00290
Philippines	0.002026	0.00207

Source: N/A

In Table 2, a portfolio prediction model of each index in ASEAN is presented, the models offered are CAPM and Smart beta, alpha, and VaR. Based on the two models offered, the Vietnam index has the best and the lowest portfolio prediction from the Philippines. To predict the portfolios of the two models not too much different from the predicted portfolios of each index, then we will discuss the amount of Return of each index in the 2004-2020 period, during that period many crises occurred, including the global crisis in 2008 and 2020 there was an outbreak of the corona virus which made the world crisis and impacted on the performance of world indices including the index in ASEAN, below is Table 3 on the ASEAN Return index in the 2004-2020 period. The 2004-2020 period is seen in the average of 5 ASEAN indices in 2008, 2011, 2015, 2018 and 2020. This condition indicates that anticipation is needed to overcome the decline in investment, especially in the ASEAN region, hence the need for a portfolio.

Table 3: Return Index ASEAN

Year	Indonesia	Singapore	Malaysia	Vietnam	Thailand	Philippines	Average
2004	0.0326	0.0115	0.0119	0.0351	-0.0110	0.0207	0.0168
2005	0.0138	0.0119	-0.0004	0.0220	0.0065	0.0128	0.0111
2006	0.0387	0.0239	0.0170	0.0875	-0.0030	0.0309	0.0325
2007	0.0369	0.0159	0.0241	0.0269	0.0209	0.0175	0.0237
2008	-0.0510	-0.0527	-0.0396	-0.0763	-0.0461	-0.0500	-0.0526
2009	0.0560	0.0457	0.0324	0.0462	0.0433	0.0428	0.0444
2010	0.0334	0.0085	0.0152	-0.0007	0.0297	0.0283	0.0191
2011	0.0040	-0.0167	0.0013	-0.0245	0.0015	0.0048	-0.0049
2012	0.0108	0.0157	0.0085	0.0155	0.0264	0.0243	0.0169
2013	0.0003	0.0017	0.0086	0.0184	-0.0044	0.0027	0.0045
2014	0.0171	0.0041	-0.0047	0.0077	0.0124	0.0175	0.0090
2015	-0.0098	-0.0124	-0.0030	0.0063	-0.0119	-0.0028	-0.0056
2016	0.0123	0.0006	-0.0023	0.0121	0.0155	-0.0004	0.0063
2017	0.0155	0.0167	0.0077	0.0338	0.0109	0.0191	0.0173
2018	-0.0017	-0.0091	-0.0045	-0.0061	-0.0087	-0.0105	-0.0068
2019	0.0018	0.0083	-0.0050	0.0065	0.0013	0.0042	0.0028
2020	-0.0168	-0.0188	-0.0031	0.0044	-0.0187	-0.0239	-0.0128

Source: N/A

The decline in the average Return on this index was caused by various factors, such as the global crisis, economic conditions in a country and disease outbreaks that attack the world as a whole. All of these conditions have an impact on the stock market in the ASEAN region. Then it will be seen how much risk is measured based on the VaR value of each index can be seen in Table (4),

Table 4: Risk of ASEAN Index

Year	Indonesia	Singapore	Malaysia	Vietnam	Thailand	Philipinnes	Average
2004	0.0032	0.0005	0.0016	0.0114	0.0020	0.0022	0.0035
2005	0.0025	0.0007	0.0007	0.0020	0.0022	0.0024	0.0017
2006	0.0029	0.0015	0.0008	0.0233	0.0023	0.0023	0.0055
2007	0.0030	0.0019	0.0017	0.0226	0.0028	0.0026	0.0058
2008	0.0114	0.0088	0.0025	0.0201	0.0121	0.0067	0.0103
2009	0.0057	0.0077	0.0019	0.0177	0.0038	0.0030	0.0066
2010	0.0029	0.0016	0.0007	0.0023	0.0021	0.0029	0.0021
2011	0.0029	0.0023	0.0015	0.0040	0.0044	0.0033	0.0031
2012	0.0014	0.0019	0.0005	0.0041	0.0013	0.0007	0.0017
2013	0.0024	0.0011	0.0005	0.0038	0.0029	0.0034	0.0024
2014	0.0003	0.0007	0.0003	0.0026	0.0009	0.0005	0.0009
2015	0.0021	0.0018	0.0007	0.0028	0.0012	0.0011	0.0016
2016	0.0007	0.0016	0.0005	0.0010	0.0006	0.0021	0.0011
2017	0.0004	0.0005	0.0003	0.0013	0.0003	0.0005	0.0006
2018	0.0010	0.0017	0.0012	0.0044	0.0017	0.0018	0.0020

| 2019 | 0.0009 | 0.0021 | 0.0003 | 0.0007 | 0.0010 | 0.0009 | 0.0010 |
| 2020 | 0.0055 | 0.0048 | 0.0024 | 0.0137 | 0.0074 | 0.0068 | 0.0068 |

Source: N/A

Measurement of the level of risk is measured based on Value at Risk (VaR) which measures the level of fluctuation of individual index movements. There is no negative VaR value because the VaR value describes the magnitude of price movements in a certain period, the higher the VaR value of an index, the greater the changes from day t and day-t, this result indicates that the individual risk of the index will be higher. It can be seen in Table 4 that the risk magnitude of the combined ASEAN indexes seen annually during the 2004-2020 period, based on the calculation that the greatest risk of all ASEAN indices in 2008 has the highest level of risk compared to other years, then in 2020 There was an outbreak of the corona virus where the world experienced a health crisis and its continuation had an impact on the economy, which was marked by a decrease in the average Return on the ASEAN index and coupled with a high VaR Risk value.

The level of risk measured based on VaR, even though the VaR value is high, it does not indicate that the index has decreased in the index price but can show an increase in the index price, so it is necessary to see the amount of Return obtained on each index. It can be seen again in Table (4) the risk in 2009 the VaR value of 0.006 indicates that there was a high movement with the index price in 2009 and when seen in Table 3 the Return obtained was positive 0.04. This result indicates a positive index price movement, this result occurs due to the improvement in the global economy as a result of the 2008 crisis, and will a similar result occur after the corona virus outbreak? Let time answer. With this result, it is necessary to have an optimal portfolio, in Table 5 the calculation of methods for designing an optimal portfolio.

Table 5: Calculation of the Optimal Portfolio

Portfolio Index ASEAN + Gold							
	Indonesia	Singapore	Malaysia	Vietnam	Thailand	Philippines	Japan	Gold
E(Ri)	0.0117	0.0034	0.0038	0.0127	0.0040	0.0084	0.0054	0.0088
Standar deviation	0.0566	0.0513	0.0345	0.0919	0.0549	0.0523	0.0536	0.0500
Variance	0.0032	0.0026	0.0012	0.0084	0.0030	0.0027	0.0029	0.0025
Beta	0.4801	0.5932	0.2507	0.6741	0.5142	0.3493		-0.0904
β2	0.2305	0.3519	0.0629	0.4544	0.2644	0.1220		0.0082
Alpha	0.0091	0.0002	0.0025	0.0091	0.0012	0.0065		0.0093
Unsystematic risk	0.0026	0.0016	0.0010	0.0071	0.0023	0.0024		0.0025
Rf	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002		0.0002

Source: N/A

Designing a portfolio requires a market that needs to be a reference for each index, in this study the market benchmark for optimal portfolio calculations is the Japanese index, the Japanese index was chosen because the Japanese index is one of the oldest indexes in ASIA, established in 1950, and Japan is one of the developed countries in ASIA, and was able to recover from the defeat of the second world war in 1945. Under these conditions the researchers made Japan a comparative index for optimal portfolio design. In this study there are 2 scenarios that will be offered where the first scenario will select 6 ASEAN stock exchanges to be included in the portfolio by dividing the investment weight equally across the 6 indices. The portfolio will then subtract 1 index that has the lowest Return rate from the first portfolio scenario, instead adding an investment other than the index, namely gold investment. Gold investment was chosen because gold has a high level of liquidity and has a stable price and is not affected by a crisis. In designing this portfolio, it will be seen which rate of Return is highest with a certain level of risk.

Portfolio design needs a market that needs to be a reference for each index, in research that becomes the market benchmark for optimal portfolio calculations is the Japanese index, the Japanese index was chosen because the Japanese index is one of the oldest indexes in ASIA which was established in 1950, and Japan is one of the developed countries in ASIA, and was able to recover from the defeat of the second world war in 1945. Under these conditions the researchers made Japan a benchmark index for optimal portfolio design. In this study there are 2 scenarios that will be offered where the first scenario will select 6 ASEAN stock exchanges to be included in the portfolio by dividing the investment weight equally across the 6 indices. The portfolio will further subtract 1 index that has the lowest rate of Return of the first portfolio scenario, as adding investment in addition to the gold investment index. Gold investment was chosen because gold has a level of liquidity and has a stable price and is not high in a crisis. In designing this portfolio, it will be seen which rate of Return is the highest with a certain level of risk.

In Table 5 we will test the average rate of Return (Ri) in the 2004-2020 period, the standard deviation which is useful for measuring the distribution of data from the average data used, Value at Risk (VaR) is measured based on the variance value of the index price movement in the period 2004-2009. Where the concept of VaR, the higher the VaR value of an index, the higher the risk to index price movements, the market risk (Beta) is tested based on a comparison of the rate of Return of the index with market Returns. The greater the beta value of an index, the risk of movement The Return will follow the Return obtained by the market, and if the beta value is negative, the results of the movement of the Return index / other investment obtained will be opposite to the market Return. Then beta squared is used to measure unsystematic risk. Unsystematic risk is a risk that can be reduced / reduced by combining a number of indexes / investments combined with the concept of portfolio diversification. Alpha is a method for measuring the success rate of an index in obtaining a Return that exceeds the market Return. The higher the alpha value of a stock, the Return obtained by the index exceeds the market Return. Therefore it is necessary to select an index or other investment to have a positive alpha value. Next will be calculated from the unsystematic risk of each index measured based on $\sigma_{ei^2} = \sigma_{i^2} - \beta_{i^2} . \sigma_{m^2}$ where the value of variance (VaR) of each index is subtracted by the product of the beta value squared index multiplied by the market variance value (VaR).

Risk free is one of the advantages of the CAPM model, risk free is used to find the expected Return. The risk free used is The Fed rate, which is the main benchmark in reference for bank interest rates in the United States. Why is the Fed rate chosen as risk free, because if the Fed's interest rate rises and is felt to be more profitable by having a Low Risk level, then investors will think of diverting their investment to investment with the Fed's Return benchmark, which results in stock investment losing funds resulting from a shift in investment to a Low Risk type of investment. Next, we will discuss how many Returns and risks from the first scenario portfolio by combining 6 ASEAN indices with the same average investment weight for each index can be seen in Table 7.

Table 7: calculation of the Return and Risk of Portfolio Index

Code	βp	αp	Wi. Unsystematic risk	
Indonesia	0.08001	0.00151	0.00043	
Singapore	0.09887	0.00004	0.00027	
Malaysia	0.04179	0.00041	0.00017	
Vietnam	0.11235	0.00151	0.00119	
Thailand	0.07573	0.00021	0.00038	
Philippines	0.00109	0.00109	0.00040	
Σ	0.40984	0.00477	0.00283	Σ
E(Rp)	0.00699		0.0000080	Σ^2
Risk Portfolio	0.00049			

Source: N/A

Based on Table 7, it is obtained from the results of the Return and risk from the portfolio from a combination of 6 indexes with the same proportion of investment funds in the 2004-2020 period. It is known that the average monthly Return obtained from this portfolio is 0.0069 with a risk level of 0.00049, calculated based on risk and Return based on the beta, alpha, and VaR levels of each index weight. The calculation of portfolio Return is calculated based $E(Rp) = \alpha p + \beta p * E(Rm)$ where the alpha number of the portfolio will be added to the value of the beta amount obtained by the portfolio multiplied by the market Return. Then for the calculation of risk is measured based on the formula $\sigma p^2 = \beta p^2 . \sigma m^2 + (\sum_{i=1}^{n} w_i . \sigma ei)^2$ by multiplying the sum of the beta squared (portfolio risk) and the market variance (VaR) value, the unsystematic risk of the portfolio is squared. Furthermore, a comparison of the level of Return and risk between the portfolio index and the market will be carried out in Table 8.

Table 8: Portfolio Index

Portfolio	Return	Risk
Asean	141%	10%
Japan	109%	58%

Source: N/A

In Table 8, the comparison of the index portfolio with the market shows that the ASEAN index portfolio Return is higher than the Japanese Nikkei market Return with a 5 times smaller risk level with market risk. This result is obtained from the multiplication of portfolio Returns in the table (mention the table above ko) which is the monthly Return, so the number of months studied in this study was 202 months, observations were made from January 2004 to October 2020. These results indicate that the risk level of the portfolio is smaller. than the risk the market takes. Next will be discussed about the level of Return and risk if there is only one index in the portfolio, it can be seen in Table 9.

Table 9: Return, Risiko and performance

Indeks Country	Return	Risk	Sharpe
Indonesia	39.3%	4.6%	20.26%
Singapore	11.6%	5.7%	6.30%
Malaysia	12.9%	2.4%	10.51%
Vietnam	43.8%	6.5%	13.61%
Thailand	12.4%	4.4%	6.94%
Philippines	22.1%	0.1%	15.70%
AVERAGE	141%	24%	73%

Source: N/A

If we look at the rate of Return, risk, and Sharpe performance of each index that has a portfolio, it can be seen in Table 9 that the highest Return is obtained by the Vietnam index, which is 43% with a risk level of 6.5%. Then the lowest Return is obtained by the Singapore index with 11.6% with a risk level of 5.7%, with the smallest results and a high level of risk, the Singapore index will be issued in the portfolio and replaced with gold investment, and the calculations can be seen in Table 10 below,

Table 10: Calculation of Return and Risk of Portfolio Index + Gold

Kode	βp	αp	Wi. Unsystematic risk	
Indonesia	0.08001	0.00151	0.00043	
Vietnam	0.11235	0.00151	0.00119	
Philippines	0.05821	0.00109	0.00040	
Malaysia	0.04179	0.00041	0.00017	
Thailand	0.08569	0.00021	0.00038	

Emas	-0.01507	0.00155	0.00041	
Σ	0.37295	0.00628	0.00297	Σ
E(Rp)	0.00825		0.0000088	Σ^2
Risk Portfolio	0.00001			

Source: N/A

Based on Table 10, the mixed portfolio Return between index and gold investment with the same investment weight results in a portfolio Return of 0.00825 with a portfolio risk level of 0.00001. A negative beta result is obtained by gold investment, this result indicates that the market risk with the risk obtained by the (Japanese) market is different, meaning that if the market experiences a decline that occurs due to a crisis or economic slowdown, different things are experienced by the price of gold, where if when a crisis occurs or an economic slowdown, the price of gold is stable and even tends to rise because gold is a very liquid and low risk investment in the event of a crisis, by combining gold investment and stock indexes it is expected to increase portfolio Returns, for more details on the results of mixed portfolio Returns can be seen in Table 11.

Table 11: Mixed Index Portfolio

Portfolio	Return	Risk
Index+Gold	167%	0.2%
Japan	109%	58%

Source: N/A

The mixed portfolio between gold and index yields a yield of 167% with a risk level of 0.2% when compared to index investment without a mixture of gold investment, the mixed portfolio has a greater Return difference of 25% and the risk level decreases by 9.7% these results are due to the minimum risk which is contributed by gold investment in portfolios due to the negative beta value obtained by gold investment, because when a crisis occurs, gold does not experience a decline and is different from the market index if a crisis occurs, the index has decreased. Furthermore, it will discuss the amount of Return and individual risk for each index and gold investment, which can be seen in Table 12.

Table 12: Return, Risk and Performance

Indeks Country + Gold	Return	Risk	Sharpe
Indonesia	39%	4.6%	20%
Vietnam	43%	6.5%	14%
Philippines	28%	3.4%	16%
Malaysia	13%	2.4%	11%
Thailand	14%	5.0%	6%
Gold	30%	-0.9%	17%
AVERAGE	167%	21%	84%

Source: N/A

In Table 12, the results are obtained where the results of the Return of each index are not far from the results of the table (mention) the portfolio index, which is different in gold investment where getting a high Return with negative risk (beta), due to the negative relationship between index price movements a market with gold prices in the event of an economic slowdown such as the economic crisis and the corona virus outbreak which causes stock market prices in the world, especially in ASEAN to decline.

5. CONCLUTIONS

The formation of an optimal portfolio needs to be done to secure investment in a state of the corona virus outbreak since early 2020, one of which is by using the Smart beta, Alpha and Value at Risk (VaR) models, this model is a development of the CAPM model. The Smart Beta, Alpha, and VaR models have advantages including being able to see market risk as a benchmark with individual indexes that can be

measured by Beta, and Alpha is used to see index Returns or stocks that are able to exceed the Returns obtained by the market, the greater the Alpha value of an index or shares, the Return earned is above the market Return. Then the advantage of VaR is a method for measuring the level of risk of an individual index/stock without being compared to the market, VaR is measured based on the variance of index price movements in a certain period, the higher the VaR value, the higher the price movement of an index, so the risk of price movements in the period will be higher.

For the optimal portfolio in this study, it is recommended to choose a mixed portfolio such as a mixture of gold investment and ASEAN stock indexes such as the indexes of Indonesia, Vietnam, Philippines, Malaysia, Thailand with the same composition. Gold investment was chosen because gold investment was declared liquid and resistant to economic crises such as in 2008 and currently there is an outbreak of the corona virus that has hit the world and made the global economy chaotic, indicated by the ASEAN index price in 2020 experiencing negative results from the previous year 2019. This does not know how long it will end, investors must do Smart calculations to manage investments in portfolios, and for further researchers, they can try to add other investments such as adding Currency investments to the portfolio and examining each year that has experienced an economic downturn marked by a decrease in the average index in a region such as ASEAN examines what optimal portfolio should be done in 2008, 2011, 2015, 2018 and 2020.

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