

## Building an Optimal Portfolio on Indonesia Sharia Stock Index (ISSI)

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**Abstract.** Indonesian economy is particularly susceptible to capital outflow and net sell position due to the relatively high share of foreign ownership in the stock and government debt market. One of the efforts to reduce the vulnerability is to increase the involvement of public participation in the capital market. The purpose of this study was to establish the optimal portfolio generated from stocks listed on Indonesia Sharia Stock Index (ISSI) and measure its performance in order to determine its potential as an instrument for the major community to invest in the stock market. Calculations using single index model approach, daily stock price data and inflation rate as a proxy of the risk free rate, produce the optimal portofolio composed of forty three stocks with preferable yield and risk than the markets (Jakarta Composite Index). The number of stocks and the value of risk which is smaller than the market risk indicate that the portfolio are well diversified. The results of the performance test using Jensen's Alpha method shows that the portfolio are able to outperform the market, JII, and ISSI.

**Keywords:** portfolio optimization, sharia stock, single index model

**Abstrak.** *Perekonomian Indonesia memiliki kerentanan yang cukup tinggi terhadap posisi net sell serta arus keluar modal akibat tingginya porsi kepemilikan asing terhadap aset-aset di pasar saham maupun pasar obligasi domestik. Salah satu upaya yang dapat dilakukan untuk mengurangi kerentanan tersebut adalah dengan meningkatkan partisipasi publik di pasar modal. Penelitian ini bertujuan untuk membentuk portofolio optimal dari saham-saham yang tercatat pada Indeks Saham Syariah Indonesia (ISSI) serta mengukur kinerjanya guna mengamati potensinya sebagai instrumen bagi masyarakat dalam berinvestasi di pasar saham. Penggunaan pendekatan model indeks tunggal, data harga saham harian serta tingkat inflasi sebagai proksi dari risk free rate menghasilkan portofolio optimal yang terdiri dari 43 saham dengan tingkat imbal hasil dan risiko yang lebih baik dibandingkan imbal hasil dan risiko yang dimiliki pasar (IHSG). Jumlah saham penyusun yang cukup besar serta nilai risiko yang lebih kecil dibandingkan risiko pasar menunjukkan bahwa portofolio terdiversifikasi dengan baik. Hasil uji kinerja menggunakan metode Alpha Jensen juga memperlihatkan bahwa portofolio mampu mengungguli pasar, JII, dan ISSI.*

**Kata kunci:** *model indeks tunggal, portofolio optimal, saham syariah*

### INTRODUCTION

One of the capital market important benefits is its role in distributing welfare to the society through investment. As a country with big population and a fairly high middle-class growth (World Bank 2011), Indonesia has a fairly big potential for public participation in the capital market. Nevertheless, reports from the Indonesian Financial Services Security (OJK) in 2014 still shows the low public participation, only 0.27% from the total of the Indonesian middle-class. This number is low compared to neighboring countries such as Malaysia and Singapore with participation level reaching 12% and 60% respectively (Bapenam-LK 2011). Furthermore the Indonesian capital market, especially the stock market, is still dominated by foreign investors. Although the proportion of Single Investor Identity (SID) of foreign investors is only 2.6% of all SIDs listed in the Indonesian Central Securities Depository (KSEI), the number controls nearly 60% of stocks in the Indonesian capital market. This condition makes Indonesian capital market particularly susceptible to net sell position by foreign investors. If sudden capital outflow of foreign ownership

happened due to certain factors in the global economy, national economy will be impacted with collapsing stock prices and depreciation of Rupiah exchange value. Therefore the efforts in increasing public interest to participate in capital market become relevant.

Appealing public interest can be done through literacy improvement regarding the available options in the capital market. Public interest in investing to the capital market attaches to the expectation of profit yields and risks attached to the available instrument. The public will compare both factors in each tool and use it as the base in decision making because investment instruments in the capital market is not the only tool that can be accessed for investment.

Between investment instruments in the capital market, stock is the most commonly traded (Ichsan and Taqwa, 2013). Aside that most of the capital market emissions are shares (OJK, 2013), stock also able to offers higher profit returns compared to bonds, sukuk (sharia bonds), or other derivative instruments. However, investing in stock also pose a risk of relatively high volatility in profit return compared to other instruments as a consequence of its high rates of transaction.

To minimize risks, a diversification process can be taken by combining stocks with low correlation to one another into one portfolio. In other words, instead of investing in one individual stock, investor can invest to a group of stocks with certain proportion.

The effort in increasing public participation in investing into capital market, especially stock, cannot be separated from the fact that the vast majority of Indonesia's population is Muslim (BPS, 2010). This fact furtherance the necessity for a capital market mechanism that is aligned with sharia principles, including the type of stocks and portfolio that can be used as investment instrument.

To address this, there are several previous researches that aims for portfolio optimization of sharia stocks in the stock market, such as researches by Talakua (2008), Rosdiana (2012), Masri (2012), and Triharyanto (2013). But all these researches used the Jakarta Islamic Index (JII) as a the base of stock group forming the portfolio. The use of JII as a stock base has a shortcoming, which is reducing chances of portfolio diversification due to the limited amount of stocks (JII only has 30 stocks).

The indication to this shortcoming can be observed in Talakua research (2008), where stocks selection in JII with index continuity criteria for two semesters in 2007 resulting an optimized portfolio that only consisted of eight and ten types of stocks. Similar results were also found in the Morina research (2012). In this research, stock selection in JII with the same criteria in the period of 2007-2010 resulting a portfolio with only two types of stocks. When referring to Tandelilin (2010), the number is considered to be inadequate because at least fifteen stocks are required for effective risk reduction in the Indonesian capital market. According to Bodie et al. (2014), based on experiences in the United States capital market, about 20 stocks are required to build a portfolio with good diversification

Efficient portfolio building is better executed when it is based on an index accommodating more stocks such as the Indonesia Sharia Stock Index. Until March 2015, the number of stocks listed in the index reached 315 shares (BEI, 2015). This is ten times the number of listed stocks in JII. Creating a big sized index to build portfolio is assessed as more likely to enable a maximum diversification of specific risks because there will be more shares included in the calculation.

Using ISSI as the stocks base for building portfolio optimization is something new and has yet been discovered in previous similar studies. This newness is not only on its status as an alternative reference to JII in building a sharia stocks-based portfolio, but also its function as an object to discover how far the risk diversification process can happen in line with the increasing size of the reference index. With this newness, this research is expected to trigger the development of future researches, to promote growth of public participation in capital market investment.

Building an optimal portfolio is based on the modern portfolio theory by Harry Markowitz in 1952. One of the most important aspects in the theory is that investment risks can be reduced through diversification process. By

identifying correlation coefficient of each assets in the market and selecting only assets with opposite correlations can build a portfolio with minimum investment risks. However, the approach has a disadvantage when used to build a portfolio from big sized stock group. The disadvantage lays in the number of estimation needed to do asset selection (Bodie et al., 2014).

Single index model is an alternative approach developed by William Sharpe to address the disadvantage. By using a regression equation identical to capital asset pricing model (CAPM), estimated number is no longer based on inter-asset correlation, rather on the correlation of each asset with a market factor. As a result, the estimation number is significantly decreased. As an example, to build a portfolio of 50 market assets using Markowitz approach will require 1,325 estimations. Meanwhile, to build a portfolio from assets with the same number using single index model will require only 152 estimations. The difference gap will get wider along the increasing number of selected assets.

With constituents reaching more than 300 types of stocks, ISSI is one of the biggest index in the Indonesian capital market. Therefore the usage of single index model is considered as appropriate in building a portfolio based on ISSI group stocks.

In this research the problem formulation highlights the following 1) What is the characteristics of optimized portfolio built from the Indonesia Sharia Stock Index (ISSI) and what is its implication on investors; and 2) Whether the performance of resulting portfolio is good enough to be used as an investment tool interesting for the public?. To answer the research question at the above, the research also aims to build and measure optimization stock portfolio performance from the shares within ISSI, to discover its potential as an alternative tool for public investment in the capital market.

## RESEARCH METHODS

In Building an optimal portfolio of stocks, observation was done to stocks listed on ISSI along with other supporting variables throughout the period of 12 May 2011 to 4 July 2014. The reason for picking 12 May 2011 as the beginning of the observation date is because it was the first time ISSI was published. To measure the performance of the resulting portfolio, observation period on the available data begins from 12 May 2011 to 30 December 2014. The additional time period is caused by the aspect of simulation (forward testing) in performance measurement.

The data used in this research include daily closing price of ISSI group stocks, Stock Exchange Composite Index (IHSG), ISSI, JII, and summaries of issuers' financial report attained from the Indonesian Stock Exchange (BEI). Also used is the monthly inflation data as a proxy to risk free rate, attained from the Indonesian Central Bureau of Statistics (BPS) and then decomposed to commensurate with daily data. The use of daily based data to build a portfolio had been applied, among others in the research of Eko (2008).

The research is divided into four stages consists of: 1) Selection of portfolio stock candidates, 2) Building optimization stock portfolio, 3) Measuring the performance of the resulting portfolio, and 4) Descriptive and fundamental analysis of issuers included in the portfolio. In stock selection, the criteria used is index continuity in ISSI. Stocks that are listed to have exited ISSI during the period of observation are not included as candidates of portfolio builder.

$$R_i = \alpha_i + \beta_i \cdot R_m + e_i \dots\dots\dots(1)$$

Building an optimal portfolio is done by single index model as applied by Elton et al. (2014). In this approach, the single index model as it is written in equation 1, is applied to estimate beta value of each stock, and then these beta values are used to rank each stock based on excess return to beta ratio (ERB) from the biggest to the smallest value. Stocks with bigger ERB values compared to its cut off values forms the portfolio. Proportion of each stock in the portfolio is then decided using a formula calculating the return yield results, beta and specific risks, Stock Exchange Composite Index (IHSG) yield level, and risk free yield level.

Whereas the performance measurement with Alpha Jensen test toward IHSG in backtesting and forward testing perspectives. Backtesting was done during the period of portfolio building, which was 12 May 2011 - 4 July 2014, while forward testing was done as the portfolio simulation in a period from 7 July 2014 to 30 December 2014. As a comparison, JII and ISSI performances were also measured in forward testing perspective using the Alpha Jensen test.

**RESULT AND DISCUSSION**

Based on screening of a number of stocks in ISSI during the period from 12 May 2011 to 4 July 2014, there are 177 stock candidates for portfolio building. Further processing on the 177 stocks resulting optimized portfolio consists of 43 stocks as shown in Table 1.

Compared to results of previous similar researches, whether the sharia stock portfolio or the conventional stock portfolio, a portfolio consists of 43 stocks is categorized as big. As an example, by JII as reference index, the portfolio built by Talakua (2008) only consisted of eight to nine stocks, Morina (2012) with two and seven stocks, Rosdiana (2012) with two to six stocks, while Triharyanto (2013) with three stocks. Meanwhile when LQ-45 is the reference index, Eko (2008) built a portfolio consisted of thirteen stocks, Tirtana (2009) with three stocks, Yuliati (2011) with seven stocks, and Pasaribu (2013) with five to thirteen stocks. The results indicate that the use of bigger index able to produce a portfolio formed by more number of stocks.

Using inflation rate variable as the risk free rate proxy is considered to impact the number of stocks building the portfolio. The use of inflation rate variable in the context of portfolio building is a new thing that

had yet discovered in previous similar researches. In several of the previous researches, most often used variable as risk free rate proxy is the BI rate or the Bank Indonesia Certificate (SBI) that tends to have higher value compared to the inflation rate. Smaller risk free rate value will widen the gap of the investor's take to the stock yield in the market because the risk free rate variable is used a the minimum threshold limit from the yield received by investor. Hence, the use of inflation rate variable instead of the BI rate will enable an increased number of stocks to be absorbed into the portfolio.

The reasons for the use of inflation variable as the risk free rate proxy cannot be separated from the philosophical foundation that free risk investment is considered to not adhere shariah regulation. Yet according to the conclusion of Hanif (2011), risk free rate itself contains two components that are the real risk free rate and the inflation pressure. Real risk free rate is a compensation over monetary value solely based on time thus does not adhere to sharia regulation, while inflation pressure is a natural consequence that it tends to be more acceptable. Therefore, although there are several other alternatives proposed by researchers, Hanif stated that inflation rate is the most suitable variable as a risk free rate proxy.

Inflation rate adequacy as risk free rate proxy has been tested during researches of Hanif (2011), also Sadaf and Andleeb (2014) in the context of Pakistani capital market. Although the context of Pakistani capital market is not identical to Indonesian capital market, what happened in the Pakistani capital market is considered to be able to represent the general condition of capital market in a developing countries so it is still being used as a reference in this research. From the results of those two researches it was discovered that there is no real difference when inflation rate is used as substitution to central bank interest rate or to government bond in the capital asset pricing model (CAPM) used as base for the single index model.

Table 1 presented the list of average yield and individual risks (variant) of each stocks forming the portfolio. From the list, a calculation of the average portfolio yield and risks are 0,1617% and 0,0031% respectively. Although it is still lower compared to individual yield of several stocks such as MKPI, STTP, or FMII, the yield level is considerably higher than the average yield of all issuers that reaches 0,1519%. The highest yield is in the ARNA stock at 0,3184% while the lowest yield is in the JSPT stock at 0,0312%. Meanwhile, the portfolio risk is much more lower compared to individual risk of its entire stocks. The lowest individual risk is in JSPT stock at 0,0080%, while average risk of all stocks is 0,1477%. Whereas the portfolio risk is 0,0031%. This condition shows that diversification process is going well because risks can be suppressed to the minimum level without changing the yield level significantly.

During the same observation period, the average yield and IHSG risk as the market index proxy are 0,0318% and 0,0142% respectively. Compared to this value, the

**Table 1. Stock Quantitative Attribute in Optimized Portfolio**

No.	Issuer	Yield	Beta	Risk	ERB	Proportion
1	MKPI	0.2281%	0.0634	0.0366%	0.0337	11.32%
2	SKLT	0.1190%	0.0420	0.0184%	0.0249	10.82%
3	ALKA	0.0527%	0.0364	0.0080%	0.0105	8.32%
4	FMII	0.1915%	0.2833	0.0378%	0.0063	7.14%
5	ARNA	0.3184%	0.8073	0.0740%	0.0038	4.85%
6	LCGP	0.2815%	0.2965	0.1040%	0.0090	4.31%
7	EPMT	0.1957%	0.3001	0.0638%	0.0060	4.27%
8	SCBD	0.2560%	0.0917	0.1248%	0.0264	3.70%
9	MERK	0.0861%	0.0133	0.0394%	0.0538	3.60%
10	SMSM	0.1827%	0.5618	0.0482%	0.0030	3.36%
11	JRPT	0.1497%	0.2783	0.0559%	0.0049	3.33%
12	JSPT	0.0312%	0.0671	0.0044%	0.0025	2.94%
13	JKON	0.1706%	0.1713	0.0932%	0.0091	2.82%
14	LION	0.1278%	0.0620	0.0800%	0.0183	2.64%
15	CTBN	0.0924%	0.0283	0.0669%	0.0276	2.24%
16	WINS	0.1696%	0.5867	0.0607%	0.0026	2.10%
17	PTSP	0.2527%	0.2519	0.2031%	0.0095	1.99%
18	STTP	0.2617%	0.3536	0.2103%	0.0070	1.85%
19	HOME	0.1832%	0.2537	0.1452%	0.0067	1.81%
20	TOTO	0.0861%	0.0934	0.0644%	0.0077	1.80%
21	TCID	0.0908%	0.2401	0.0445%	0.0032	1.77%
22	HERO	0.2243%	0.6310	0.1347%	0.0033	1.67%
23	BAYU	0.1100%	0.2249	0.0824%	0.0043	1.49%
24	RDTX	0.0593%	0.0518	0.0659%	0.0087	1.14%
25	IIKP	0.1321%	0.2582	0.1372%	0.0046	1.14%
26	PSAB	0.3026%	0.4238	0.4596%	0.0068	0.98%
27	SIAP	0.1432%	0.2701	0.2286%	0.0048	0.77%
28	DNET	0.1106%	0.2771	0.1409%	0.0035	0.76%
29	ACES	0.1514%	0.7110	0.0704%	0.0019	0.72%
30	CMNP	0.1457%	0.7358	0.0595%	0.0018	0.52%
31	BRAM	0.0506%	0.0578	0.1094%	0.0063	0.51%
32	ZBRA	0.1392%	0.3614	0.2801%	0.0035	0.49%
33	GMTD	0.3085%	0.3176	1.0607%	0.0093	0.47%
34	AIMS	0.1455%	0.4907	0.2754%	0.0027	0.40%
35	GDYR	0.0623%	0.2452	0.0541%	0.0020	0.35%
36	KAEF	0.2177%	1.1873	0.0978%	0.0017	0.33%
37	ESTI	0.1024%	0.0729	0.5385%	0.0121	0.29%
38	PGLI	0.0592%	0.1277	0.2183%	0.0035	0.23%
39	MYOR	0.1214%	0.6493	0.0419%	0.0017	0.23%
40	CWOL	0.2035%	1.1271	0.1086%	0.0017	0.21%
41	ATPK	0.0532%	0.1458	0.2071%	0.0027	0.16%
42	LMSH	0.0669%	0.2797	0.1217%	0.0019	0.14%
43	KOIN	0.0932%	0.4606	0.2762%	0.0017	0.05%

**Table 2. Issuers Qualitative Attribute in Optimized Portfolio**

No.	Issuer	Sector	Business Subsector	Head of Market* (Rp. Million)	Pos in Record Board
1	MKPI	PRO	Property and Real Estate	14,862,940	Development
2	SKLT	KON	Food and Beverages	252,120	Development
3	ALKA	IND	Logam Products etc.	60,919	Development
4	FMII	PRO	Property and Real Estate	1,197,240	Development
5	ARNA	IND	Ceramic, Glass and Porcelain	7,414,845	Main
6	LCGP	PRO	Property and Real Estate	2,426,530	Development
7	EPMT	DAG	Big Trading	9,480,240	Development
8	SCBD	PRO	Property and Real Estate	12,457,845	Development
9	MERK	KON	Pharmacy	4,478,880	Development
10	SMSM	ANK	Automotive and Its Components	6,550,493	Main
11	JRPT	PRO	Property and Real Estate	12,650,000	Main
12	JSPT	DAG	Hotel and Tourism	1,739,052	Development
13	JKON	DAG	Big Trading	10,355,910	Main
14	LION	IND	Logam Products etc.	572,176	Main
15	CTBN	IND	Logam Products etc.	4,442,061	Main
16	WINS	TRA	Transportation	5,673,751	Main
17	PTSP	DAG	Hotel and Tourism	993,636	Development
18	STTP	KON	Food and Beverages	3,943,100	Development
19	HOME	DAG	Hotel and Tourism	933,818	Development
20	TOTO	IND	Ceramic, Glass and Porcelain	3,962,880	Development
21	TCID	KON	Cosmetics and Household	3,418,133	Main
22	HERO	DAG	Retail Trade	12,341,720	Main
23	BAYU	DAG	Hotel and Tourism	243,722	Development
24	IIKP	AGR	Fishery	6,048,000	Development
25	RDTX	PRO	Property and Real Estate	1,357,440	Main
26	PSAB	TAM	Metal and other Minerals	3,742,200	Development
27	SIAP	IND	Plastic and Packaging	132,393	Development
28	DNET	DAG	Computer and Services	10,496,160	Development
29	ACES	DAG	Retail Trade	15,863,750	Main
30	CMNP	TRA	Roads, Ports and Airports	8,646,000	Main
31	BRAM	ANK	Automotive and Its Components	1,473,750	Main
32	ZBRA	TRA	Transportation	84,580	Development
33	GMTD	PRO	Property and Real Estate	812,304	Development
34	AIMS	DAG	Big Trading	50,600	Development
35	GDYR	ANK	Automotive and Its Components	658,725	Main
36	KAEF	KON	Pharmacy	6,831,420	Main
37	ESTI	ANK	Textile and Garment	441,330	Main
38	PGLI	DAG	Hotel and Tourism	60,024	Development
39	MYOR	KON	Food and Beverages	26,696,287	Main
40	CWOL	PRO	Property and Real Estate	2,849,660	Development
41	ATPK	TAM	Coal Mining	1,480,383	Development
42	LMSH	IND	Metal and other Minerals	73,920	Development
43	KOIN	DAG	Retail Trade	430,590	Development

Notes for table 2

\* Per 25 July 2014

\*\* Notes. IND=Basic Industry and Chemical; DAG=Trade, Services and Investment; KON = Consumption Goods Industry; ANK = Miscellaneous Industry; PRO = Property and Real Estate; TAM = Mining; AGR = Agriculture; TRA = Transportation, Infrastructure and Utility

portfolio yield and risk level seems better. Overmore when assessed based on Sharpe ratio, the higher level of yield and lower level of risk are indications that the portfolio performance is above the market performance during the observation period. the condition is expected to hold until several periods in the future.

Other information obtained from Table 1 is related to the portfolio low sensitivity toward the market, shown by the beta values of its composing stocks are near zero. Despite having a big range, from the lowest value of 0.0133 (MERK) to the highest at 1.1873 (KAEF), generally the portfolio is dominated by stocks with considerably low beta values. Average Beta values of each stock is 0.3253 while the average weighted (portfolio beta) is 0.2254. When assessed with Treynor ratio, more than one small beta portfolio value is an indication that the portfolio performance is generally above IHSG

Related to beta value, excess return to beta ratio (ERB) variable shows the risk premium of each stock per one systematic risk unit. Therefore ERB variable shows the superiority of a stock over other stocks in the market. The higher ERB value of a stock, the higher the stock's chance to be included in a portfolio. However, there are exceptions when a stock has negative yield and beta values. Supposing because of the condition the stock concerned have high ERB value, the stock remains to be excluded from the portfolio. In Table 1, it can be observed that the lowest ERB value is in MYOR, COWL, and KOIN stocks at 0.0017. These values are the lowest threshold that other stocks in ISSI that are not included in the portfolio certainly has a lower ERB values.

Although ERB has an important function in deciding the stock candidates building the portfolio, ERB is not the proportion main determinant. Aside of ERB value, proportion determinants calculate the ration between beta values with specific risks owned by each stock. The higher this ratio, the bigger is the chance of a stock to have a bigger proportion in the portfolio. This causes a condition where a stock with high ERB has small propotion in a smaller portfolio compared to other stocks. This condition among others are illustrated by MERK and SCBD stocks that have high ERB but with smaller proportion compared to ALKA stocks with lower ERB.

Related to the composition, Table 2 shows that the portfolio is supported by seven main stocks or a sixth of the total stocks. The combination of the top seven stocks formed over than 50% of the portfolio. Meanwhile composing 90% of the portfolio requires 23 stocks or only half of the total stocks building the portfolio. Thus influences on those 23 stocks, both external factor such as regulation or internal factor such as corporate action,

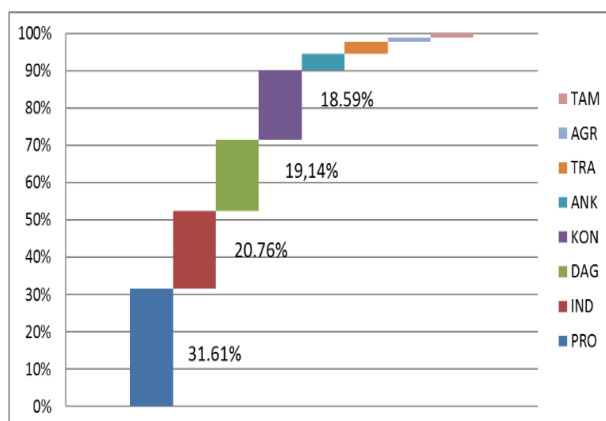
can give significant impact to the portfolio as a whole.

From the nine categories of business sector within the capital market, the only business sector not included in the portfolio is the financial sector. The absence of financial sector's issuers can be understood due to restriction on the type of issuers allowed in ISSI. Business characteristic in the financial sector is considered to have yet comply to the principle stated in Fatwa Number 40/DSN-MUI/X/2003 regarding Capital Market and General Guidance to the Implementation of Sharia Principles in Capital Market. Hence, financial sector issuers are not only excluded from the resulted portfolio, they are also in overall not available from the 177 filtered stocks.

Based on the weight, the portfolio is supported by the property sector and basic and chemical industry with the proportion of stocks in both sectors forming more than 50% as it is shown in Figure 1. When added with the weight of stocks in trade sector and the consumption goods industry stocks, the proportion reaches to be over 90%. This significant proportion causes a chane of business landscape in the four sectors that could provide real impact on the portfolio value. The change in business situation has impacts on the change of issuer's ability to gain profit and in turn change the investor's perception toward the value of the concerned issuer's stock. When change on stock of value of certain sector happened simultaneously, portfolio value will also change in overall. Thus, in the context of this portfolio, the four sectors are priority sectors that needs to have investors attention when analyzing the industry condition.

In terms of historical aspect, a portfolio supported by most of the four sectors is considered to be quite well. Property, basic chemical industry, trade and consumption goods industry sectors are sectors that show growth tendencies from time to time. In the last 4 years since 2011 until the end of 2014, the sectoral index of the four sectors shows development. PROPERTY as the property and real estate sector index experienced growth of 160% (from 199 to 534), while TRADE as the trade, services and investment sector index recorded a growth of 80% (490 to 881). In the meantime BASIC-IND as the basic industry and chemical sector index recorded an approximately 40% growth (387 to 541), while CONSUMER as the consumer goods industry index experienced an even higher increase of more than 200% (1,070 to 2.207). According to Sutomo (2014), consumption goods industry sector is also a sector impacted the least during an economic crisis. The tendency of sector growth is expected to continue thus contribute to the portfolio value increase.

Other information given by Table 2 is that the portfolio is composed of stocks with variable capitalization value. Variation on the capitalization value is within a quite big range, the smallest in Rp 50.60 billion (AIMS) to the biggest Rp 26.29 trillion (MYOR) with average capitalization value of Rp 4.85 trillion per stock type. From the 43 stocks composing the portfolio, 28 stocks have below average capitalization value, indicating that the portfolio is dominated by stocks with small capitalization value.



**Figure 1. Weight of Sectoral Portfolio Proportion**

Sources: Research data processing results, 2015

\*\*Notes : IND=Basic Industry and Chemical; DAG=Trade, Services and Investment; KON = Consumption Goods Industry; ANK = Miscellaneous Industry; PRO = Property and Real Estate; TAM = Mining; AGR = Agriculture; TRA = Transportation, Infrastructure and Utility

The total capitalization value of overall stocks in the portfolio is Rp 208.68 trillion. This value covers 4.13% of the market total capitalization value in the Indonesian stock market per 8 August 2014. This value is smaller compared to the capitalization value of one issuer UNVR (PT. Unilever Indonesia Tbk) that reaches Rp 232.72 trillion or about 4.63% of the total capitalization of the Indonesian stock market (BEI, 2014).

Big number of stocks with smaller capitalization value in the portfolio gives advantage and at the same time shortcoming. According to Reinganum (1999) issuer with small capitalization value has the potential to give higher yield in a long term investment period. Whereas its shortcoming is on the limitation of the portfolio in its practicality. The small capitalization market value, aside of reducing liquidity level of the concerned stock, also limit the amount of investment from the investors.

Investment amount limitation can happen when the stocks proportion in the portfolio is disproportionate to the level of market capitalization as it can be observed on the ALKA stocks. As stocks with the third biggest proportion in the portfolio (8.32%), ALKA is limited by the market capitalization value of mere Rp 60,92 billion. While TOTO stocks with the twentieth biggest proportion (1.80%) actually has Rp 3.96 trillion capitalization value. Thus when investors are going to invest according to the proportion of each portfolio's stocks, the capital potential that could be utilized will only be Rp 732.44 billion. This is far smaller compared to the portfolio total capitalization value of Rp 208.68 trillion. The relationship pattern between the stocks proportion, the capitalization value and the investment value threshold can be further seen in Table 3.

Table 3 shows the attributes of twenty stocks with the lowest market capitalization value in the portfolio. Investment threshold value is obtained by dividing the market capitalization value of a stock with its proportion

within a portfolio. The value is the maximum amount of fund that can be allocated to be able to invest accordingly with the recommended proportion in the portfolio. As an example, when an investor invest to SKLT stocks, the maximum fund that can be invested is Rp 2.33 trillion. When the investor invested in SKLT stocks with big amount, the excess amount cannot be allocated due to the limit on SKLT capitalization value at Rp 252.12 billion. And this is yet to include the internal condition of stock issuer into consideration, which generally limit public ownership to below the entity of majority stockholders. Considering this, the value threshold of public investment will be even smaller.

Investment activity into a portfolio is an investment activity to its composing stocks simultaneously so that the portfolio investment value threshold is taken from the smallest investment value threshold of those stocks. In Table 3, it could be observed that the lowest investment value threshold is on ALKA stocks. The small investment value threshold can be considered as the portfolio's weakness.

Based on the results of portfolio performance during observation period on 12 May 2011 to 4 July 2014, it can be seen that the portfolio performance exceeded market performance as signaled by positif valued alpha variable, at 0.1488% as it can be seen in Table 4. This results proven the early indication related to a more superior portfolio performance shown by the higher yield and lower portfolio risks compared to IHSG yield and risks. Figure 2 gives an illustration of the superior portfolio performance.

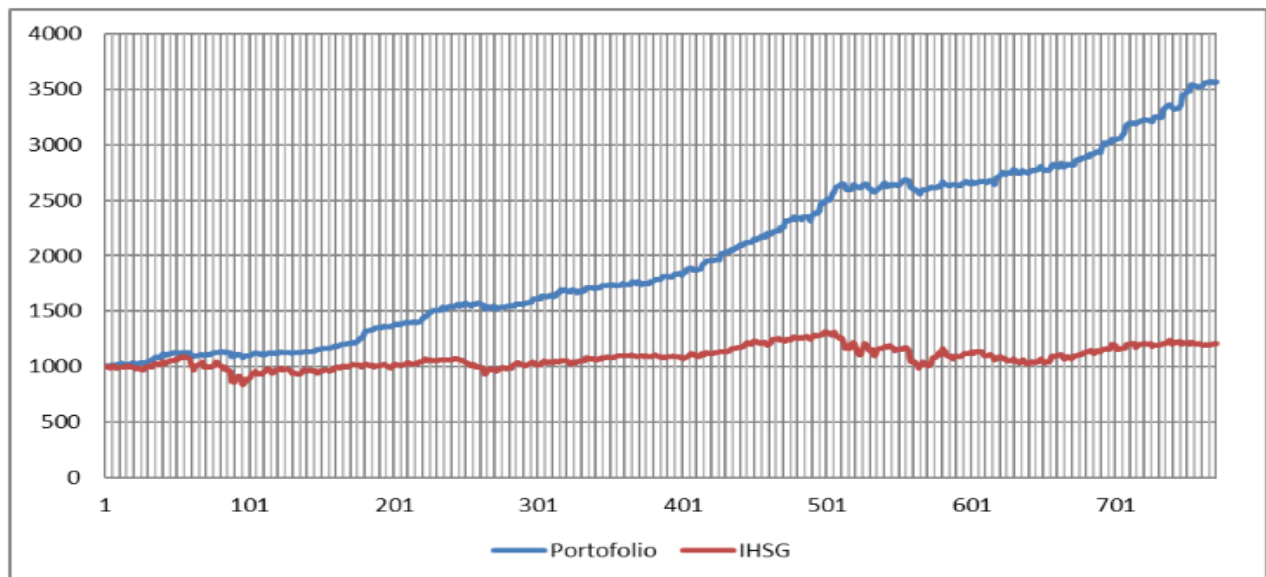
In Figure 2, the horizontal axis is the observation period span, where 12 May 2011 (the start) is symbolized with the number 1 while 4 July 2014 (the end) is in 770 position. While the vertical axis reflects the changes of investment value from time to time with basic investment value of 1000 unit. The graphic provides at least two informations. First, the portfolio graphic always remains above the IHSG graphic throughout the observation time that signifies portfolio yield always surpassed IHSG from time to time. Second, by assuming the investment was done right when the observation period began, and ended when the observation period ended, investment values gained from the portfolio ias about 3.5 times larger compared to investment value on IHSG.

The test is a test to the period when the portfolio was formed (backtesting) To see the portfolio reliability as an investment instrument in the future (forward testing), a performance test was implemented along with investment simulation in the time span of six months after the observation, which was since 7 July 2014 to 30 December 2014. Apart from the resulting portfolio, testing and simulation were also done to JII and ISSI as comparisons.

Simulation is done by handling both portfolio or JII, ISSI and IHSG as investment assets. As it is also shown in Figure 2, the instruments' yield return level is measured in clean asset value unit (NAB), a mechanism similar to what is being used as mutual

**Table 3. Comparison of Proportion, Market Capitalization and Investment Value Threshold in the Portfolio**

No.	Issuer	Proportion	Head of Market*(Rp. Million)	Investment Value Limit (Rp. Million)
1	AIMS	0.40%	50,600	12,738,262
2	PGLI	0.23%	60,024	26,068,125
3	ALKA	8.32%	60,919	732,437
4	LMSH	0.14%	73,920	52,287,819
5	ZBRA	0.49%	84,580	17,173,310
6	SIAP	0.77%	132,393	17,246,622
7	BAYU	1.49%	243,722	16,377,592
8	SKLT	10.82%	252,120	2,330,715
9	KOIN	0.05%	430,590	936,970,744
10	ESTI	0.29%	441,330	152,540,977
11	LION	2.64%	572,176	21,701,130
12	GDYR	0.35%	658,725	188,612,492
13	GMTD	0.47%	812,304	173,519,948
14	HOME	1.81%	933,818	51,716,042
15	PTSP	1.99%	993,636	49,941,423
16	FMII	7.14%	1,197,240	16,774,585
17	RDTX	1.14%	1,357,440	119,499,786
18	BRAM	0.51%	1,473,750	291,718,542
19	ATPK	0.16%	1,480,383	948,040,624
20	JSPT	2.94%	1,739,052	59,123,407



**Figure 2. Graphic on Performance Comparison Between the Portfolio and IHSG (Backtesting)**

funds investment. The difference lay on the absence of operational cost that NAB in this context is equal to total asset value. As the base value, 1,000 is the benchmark value on the investment date in its process fluctuating along the dynamics of daily closing price. Positive yield is signified by NAB bigger than 1,000, while negative yield is signified by NAB smaller than

1,000. Test or simulation results described in Table 4 and Figure 3.

Table 4 provides the information that the portfolio has positive alpha value on most of the period and signifies a better performance than the market. The bad performance happened after December 2014, signified by negative alpha value (-0.0344%) Meanwhile,



**Table 3. Comparison of Proportion, Market Capitalization and Investment Value Threshold in the Portfolio**

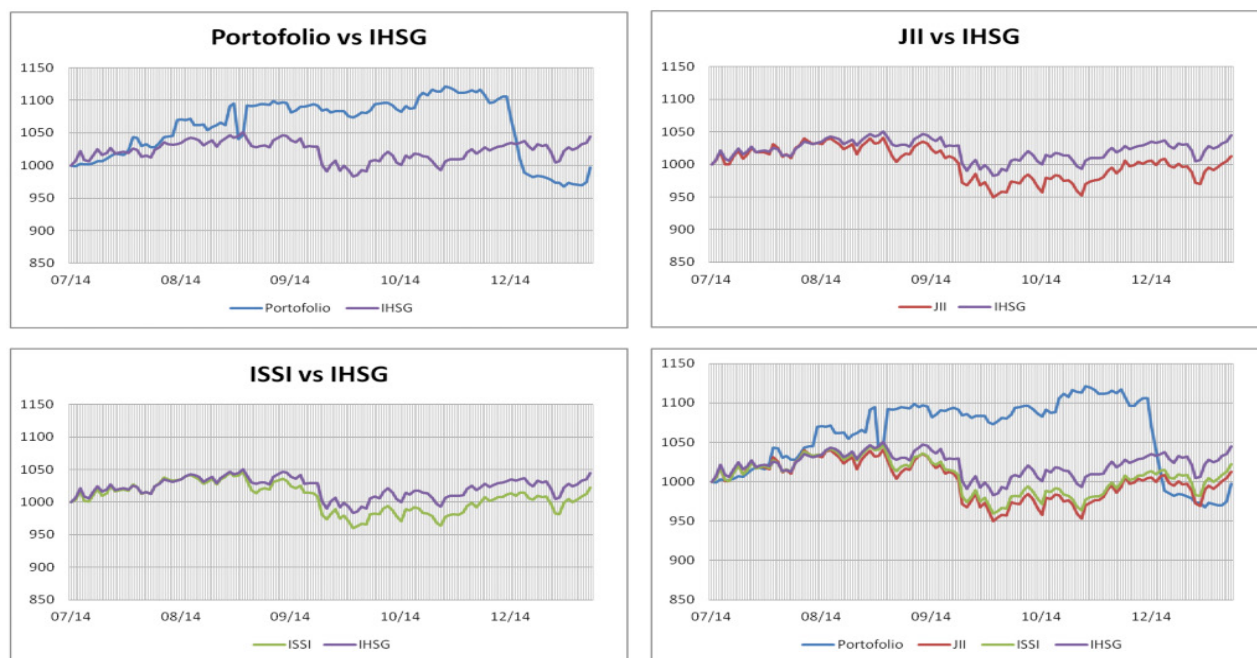
No.	Period	Portfolio		JII		ISSI		IHSG
		Yield	Alpha	Yield	Alpha	Yield	Alpha	Yield
1.	12/05/2011 - 04/07/2014	0.167%	0.148%	-	-	-	-	0.032%
2.	07/07/2014 - 25/07/2014	0.167%	0.120%	0.282%	-0.033%	0.267%	-0.016%	0.262%
3.	07/07/2014 - 29/08/2014	0.180%	0.129%	0.119%	-0.051%	0.139%	-0.006%	0.135%
4.	07/07/2014 - 30/09/2014	0.167%	0.143%	0.063%	-0.036%	0.061%	-0.027%	0.082%
5.	07/07/2014 - 31/10/2014	0.112%	0.089%	0.013%	-0.039%	0.017%	-0.030%	0.047%
6.	07/07/2014 - 28/11/2014	0.106%	0.077%	0.029%	-0.025%	0.030%	-0.020%	0.049%
7.	07/07/2014 - 30/12/2014	0.003%	-0.034%	0.034%	-0.023%	0.038%	-0.016%	0.053%

compared to JII and ISSI, the first five months of the portfolio can be considered to have better performance. It is recorded to have positive yield throughout the observation period, both indexes always have negative alpha value. In December, the portfolio performance is beneath the three indexes, signified by smaller alpha value compared to that of the three.

This condition is confirmed by simulation result graphic, displayed in Figure 3 that shows NAB of the portfolio, JII, ISSI and IHSG fluctuated through the 6 months time range. NAB portfolio graphic is seen to be above the market's NAB graphic since July to early Desember 2014. This represents the portfolio superior performance as well as the positive value alpha yield. To

the end of December, the portfolio's NAB experienced drastic decline and its position is under the market's NAB, whereas it is relevant to the negative alpha value in the same period. Meanwhile the graphics of NAB, JII, or ISSI are seen to never surpass the market's NAB since July to December 2014. This condition reflects the alpha of both indexes always has negative values during the observation period.

It is recorded that the highest portfolio NAB was 112.083 (yield 12.08%) on 11 November 2014 or about 5 months after the simulation began. The yield value is considered competitive enough, above inflation or conventional deposit interest rate in an identical time span. Meanwhile the highest NAB position of IHSG

**Figure 3. Graphic on performance comparison between the portfolio and IHSG (forward testing)**

is 1050.79 (yield 5.08%) on 8 September 2014 or 2 months after the simulation began. Whereas the lowest portfolio NAB is on 967.76 (yield -3.22%) on 18 December 2014 while IHSB lowest NAB is on 982.99 (yield -1.70%) on 13 October 2014,

In building portfolio, there is a basic assumption that the tendency of stock value dynamics in the past reflects the same tendencies in the future. In reality this assumption can be completely not applied. Apart from the difference of stock evaluation period with testing period, simulation results as being shown in Figure 3 that although in the past portfolio's performance had good value ( $\alpha > 0$ ), the opposite can happen in the future. In other word, although the results attained during observation stated that the portfolio risk is only 0.0031%, investor still needs to realize the potential loss in investing.

The rather big number of stocks building the portfolio (43 stocks) gives consequences on big portfolio administration cost, whether it is direct such as transaction cost and tax, or indirect such as time and effort to do periodical evaluation. To reduce this implications, investors can choose to use passive strategy in medium time span (1-3 years). The passive strategy meant was buy and hold stocks for a relatively long time span disregarding price fluctuation in the market nor other technical indicators.

Passive strategy selection apart from able to reduce transaction number and asset evaluation per time unit, can also avoid investors from information bias when short term panic happened in the capital market. Whereas time span selection of one to three years is based on the length of observation period. With the assumption that portfolio performance tendencies in the future is reflected from its past performance, investor is expected to be able to enjoy portfolio superiority that exceeds market performance, both IHSB and ISSI.

Proportion structure of stocks forming the portfolio shows progressively narrowing distribution. Eight stocks with the biggest proportion order are forming more than 50% portfolio, while 23 stocks with the biggest proportion order are forming more than 90% of the portfolio. This has implication toward the portfolio flexibility toward the investors' fund allocation. Investment to half of the stocks can give 90% benefit of the portfolio. Therefore, instead of investing on the entire stocks, public with limited fund can invest by allocating their fund according to their ability to fulfil the stock proportion order in the portfolio

Stock performance is not separated from the macro condition dynamics influencing the industry in general. However, each industrial sector has different characteristic in responding to situational changes. Hence, public who invests according to a portfolio needs to be aware of macro issues influencing business trends in sectors supporting the portfolio such as property and basic chemical industry; Non-cyclical dynamics, fundamental and influential to the industrial sector in the long term need to be considered in deciding which investment to choose.

## CONCLUSION

Based on calculation on stocks listed on ISSI from 12 May 2011 to 4 July 2014 using a single index mode, an optimised stocks portfolio consists of 43 stocks, with expectations of bigger daily yield bigger and risk factor smaller than the market index (IHSB) In this portfolio, 23 stocks with the biggest proportion form more than 90% of the portfolio. Whereas the biggest proportion in the portfolio is by MKPI stocks and the smallest proportion is by KOIN stocks.

Portfolio characteristics can be summarized into three aspects, which are the sectors forming it, its performance and its ability in absorbing public funds. Based on its forming sectors, the portfolio is mostly formed by stocks in the trade, property and basic chemical industry sectors. Based on its performance, the best portfolio compared to IHSB, JII, and ISSI throughout the observation time span that it is adequate to be used by the public as an investment instrument in the capital market. While based on its ability in absorbing public fund, the portfolio is considered weak due to the small investment value threshold.

Based on the results of the research, there are two suggestions. First, to reduce portfolio's shortcoming due to the small market capitalization value in any similar research in the future, market capitalization value can be used as a criteria in asset selection between stocks that will be used as the bases of portfolio building. Second, an advance research aiming to compare performances of portfolio that is purely resulting from technical approach such as the single index model, with portfolio that is resulting from synchronization between technical approach and fundamental approach.

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