International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 02 February 2023
DOI: 10.47191/ijcsrr/V6-i2-56, Impact Factor: 5.995
IJCSRR @ 2023
www.ijcsrr.org

Portfolio Rebalancing with GARCH Model at Jarvis Balanced Fund

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ABSTRACT: With high inflation economy, investors must find another way to minimize their risk, but also maximize their return of the portfolio. Various instruments used for finding the most suitable amount of portfolio allocation. Single instruments, such as stocks, bonds, and time deposits is chosen by investors to secure their assets from inflation. The other investors chose mutual funds to grow their investments. One of the solutions to find the portfolio allocation is to rebalance the portfolio. In other perspectives, time-series model will help investors to predict the volatility that will happen in the future. GARCH (Generalized Autoregressive Conditional Heteroskedasticity) model is used for finding volatility and generalized it from the ARCH Model. With GARCH Model, the total amount of residual and GARCH has to be less than 1. Either way, it will be categorized as a volatile asset. From the top 5 balanced fund in 2021, Jarvis Balanced Fund is one of the best-balanced funds with return of 55.85%/year. Using Jarvis Balanced Fund (JBF) portfolio from 2021 prospectus as the sample of this research, it is concluded that JBF has to reduce the number of stocks and increase the risk-free assets to prevent volatility that happen in the portfolio. Following with the macro economy of high-inflation economy era.

KEYWORDS: GARCH Model, Portfolio, Portfolio Rebalancing, Rebalancing, Volatility, High Inflation.

INTRODUCTION

After CoVID-19 pandemic that had been running since 2020, The indicator of Indonesia's economy is getting better represented with inflation, consumer confidence, consumer price index (CPI), and GDP growth that had been increasing since 2021. The Jakarta Composite Index (JCI) is also recovered, from the lowest point from 24th March 2020 at 3911.71 to the all time high level from 15th September 2022 at 7377.49. Contrary from Indonesia, the global economy is weakened [1] because of Russia-Ukraine war, supply chain disruption, and high-inflation era. Besides the commodity supercycle that happened with commodity price in 2021, the decision from Jerome Powell to increase rates to fight the inflation made the economy volatile [2]. According to the data from November 2022 [3], market capitalization of JCI has already hit Rp 9,559.87 trillion, excluding mutual funds and other products from capital market. According to OJK [4] total assets under management are at Rp 508.18 trillion with declination from 2021 that hit Rp 579.95 trillion or 12.37% declined. While the risk-asset is discussed, it's also being a threat because of macro economy issue that triggered capital outflow, with the bonds outflow at Rp 227 trillion and inflow at stock market for Rp 78.86 trillion (Elena, 2022). The stock market is still interesting to be invested in, rather than the bond market. According to the OJK [4] there are several types of mutual funds such as money market mutual funds, fixed income mutual funds, stock mutual funds, balanced funds, and syariah mutual funds. Each type of mutual fund has its own proportions and advantage to get profit in the market. The data [5] shows that top 5 balanced funds in 2021 are Jarvis Balanced Fund (55.85%/year), Syailendra Balanced Opportunity Fund (24.42%/year), Sucorinvest Flexi Fund (22.94%/year), Sucorinvest Citra Dana Berimbang (19.11%/year), and STAR Balanced II (18.41%/year). From mutual funds, the balanced funds are chosen because it can prevent risk with flexible proportion of maximum 79% on each asset (time deposit, bonds, stocks). To count the flexible proportions of balanced fund, GARCH Model is used to forecast volatility with more flexible lag on it. To develop the GARCH Model, the previous ARCH Model is used and using the ARMA Model to find the fit model to be used. Using eviews as the tool to solve the heteroskedasticity data and finding the volatility from the Jarvis Balanced Fund data in 2021 prospectus.

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BUSINESS ISSUE

As we can see from the net asset value of Jarvis Balanced Fund, from April until July 2022, Jarvis' net asset value per unit had been declined up to 19.18%. The slightly decreasing of net asset value is caused by many factors, such as investors, financial markets, and technical factors. The NAV declining should be a warning for Jarvis Balanced Fund to improve their methods in their portfolio.

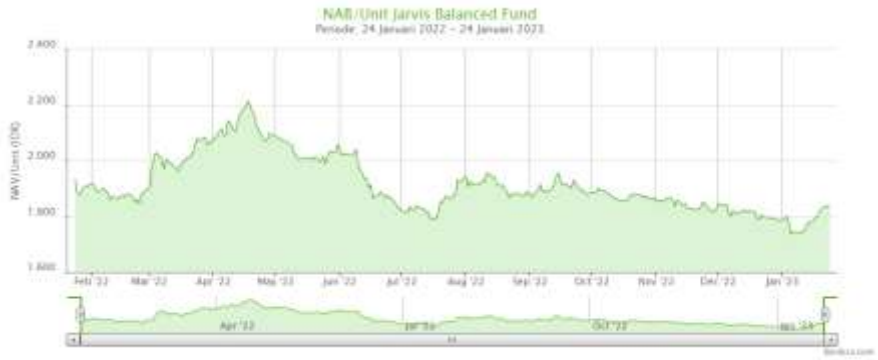

Figure 1- 1: Total Net Asset Value of Jarvis Balanced Fund (Source: Bareksa)

On previous holding in 2021, this is the composition and graphs of Jarvis Balanced Fund.

Table 1- 1: Jarvis Balanced Fund (Source: Bareksa)

Jarvis Balanced Fund		
STOCKS	Sectors	
ADRO	Commodity	8,85%
ASSA	Transportation & Logistics	8,77%
ARTO	Financials	7,92%
BBYB	Financials	7,90%
ERAA	Trading	6,15%
TBIG	Infrastructure	4,77%
HRUM	Commodity	4,52%
BOLA	Service Company	4,30%
MDKA	Commodity	4,26%
EXCL	Telecommunications	4,23%
LINK	Technology	3,91%
AKRA	Commodity	3,74%
DSNG	Agriculture	2,74%
BUKA	Technology	2,24%
TNCA	Transportation & Logistics	1,46%
FREN	Telecommunications	1,05%
DMMX	Technology	0,08%
TFAS	Technology	0,08%
NFCX	Technology	0,05%
	Suibtotal	77,02%

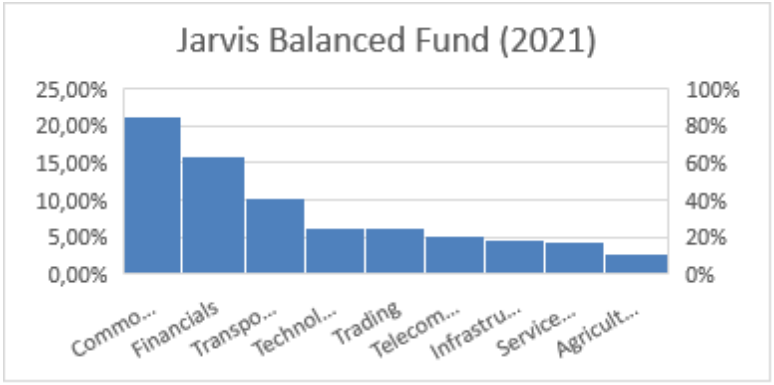

Figure 1- 2: Jarvis Balanced Fund, 2021 (Source: Prospectus)

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From this data, we can see that the composition dominates with commodity with value of 21.37% (ADRO, HRUM, MDKA, AKRA), financials with total of 15.92% (ARTO, BBYB), Transportation & Logistics (ASSA, TNCA) with 10.23% and technology sectors with 6.36% (BUKA, LINK, DMMX, TFAS, NFCX). From the portfolio component, Jarvis held on to technology aspects with differentiate sectoral.

With the high inflation and interest rate hike that already happened in U.S. and European Countries, Jarvis Asset Management should be cautious with the activities that happened. Interest rate hike should be the alert of new business cycle that should be taken by Jarvis Balanced Fund.

Alongside of the falling of technology sector in 2022, Jarvis couldn't get the same amount of return in 2021. To get the purpose of the same and/or the higher return in 2023, Jarvis wanted to secure their return to this level or increasing it with this current economy condition. Choosing the sector that supported interest rate hike will be their advantage to get the better return in 2023, also securing it with the bonds and time deposits that offers higher rate contract. Choosing the assets with valuations from fundamental analysis and GARCH model can help choosing the right asset to be invested other than low-risk asset for the balanced fund.

METHODOLOGY

The data that used is prospectus of Jarvis Balanced Fund in 2021 consists of Time Deposits, Bonds, and Stocks. Also, the details of this data will be on 5 years (from 2017 to September 2022) for each assets. In this research, the author will use eviews as the econometrics tools to run the GARCH process. The steps of eviews are ADF Test, finding the correlogram, selecting the ARMA Model (whether it will be AR, MA, or ARMA based on the smallest amount of Akaike Info Criterion), finding the ARCH, and the last step is finding the GARCH Model with the heteroskedasticity. The GARCH Model that will be used is GARCH Model (1,1) because it's easier to be applied for every data [6]

The analysis steps to reach the GARCH model are as follows:

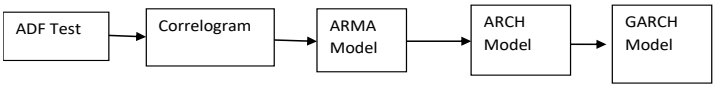

Figure 3-1: Steps of GARCH Model

GARCH model is used for predicting volatility on the stock market that is chosen by Jarvis Balanced Fund. Bollerslev [7] said that there are some models for this research.

GARCH (p,q) process

$$\varepsilon_t|\varphi_{t-1} \sim N(0, h_t), \tag{1}$$

$$h_t = \alpha_0 + \sum_{i=1}^{q} \alpha_1 \varepsilon_{t-i}^2 + \sum_{i=1}^{p} \beta_1 h_{t-i} = \alpha_0 + A(L)\varepsilon_t^2 + B(L)h_t \tag{2}$$

where

$$p > 0, \quad q > 0 \quad \alpha_0 > 0, \quad \alpha_i \geq 0, \quad i = 1, \dots, q, \quad \beta_1 \geq 0, \quad i = 1, \dots, p. \tag{3}$$

For GARCH (p,q) model, the process reduced from $p = 0$ into the ARCH(q) process, and for the $p = q = 0$ is white noise.

GARCH (1,1) Process

$$h_t = \propto_0 \propto_{1\epsilon_{t-1}^2} + \beta_1 h_{t-1}, \tag{4}$$

where

$$\alpha_0 > 0,\ \alpha_1 > 0, \beta_1 > 0. \tag{5}$$

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From this theorem of GARCH (1,1) process, it has been used by many researchers because GARCH (1,1) process is more simple than other GARCH process.

$$\mu(\alpha_1, \beta_1, m) = \sum_{j=0}^{m} \binom{m}{j} \alpha_j \alpha_1^j \beta_1^{m-j} < 1 \quad (6)$$

where

$$\alpha_0 = 1, \quad \alpha_j = \prod_{i=1}^{j}(2j-1), \qquad j = 1\ldots.. \quad (7)$$

For the *2m*th moment expressed as below:

$$E(\varepsilon_t^{2m}) = \alpha_m[\sum_{n=0}^{m\sim 1} \alpha_n^{-1} E(\varepsilon_t^{2m}) \alpha_0^{m-n} \left(\frac{m}{m-n}\right) \mu(\alpha_1, \beta_1, n)] \text{ x } [1- \mu(\alpha_1, \beta_1, m)]^{-1} \quad (8)$$

For the lag process of GARCH (1,1) expressed as below:

$$\xi = \sum_{i=1}^{\infty} i\delta_i / \sum_{i=1}^{\infty} \delta_i = (1-\beta_1)^{-1} \quad (9)$$

Median lag for GARCH (1,1) is found below:

$$v = -log2/log\beta_1 \quad (10)$$

From previous research, Bollerslev [7] said that GARCH (1,1) process is more simple than GARCH (p,q) process. GARCH (p,q) process allows lagged conditional variances to enter as well. In general, GARCH (p,q) model can be shown as an ARCH (∞) model. Using GARCH (p,q) model and (1,1) model depends on the lag from the data. ARIMA model and ARCH model will help to determine the GARCH model that will be chosen.

BUSINESS ANALYSIS AND SOLUTIONS

1) Business Analysis

From this data, the Augmented Dickey-Fuller (ADF Test) or the unit root test from time deposits, bonds, and stocks are as below:

Table 4- 1: Unit Root Test (Jarvis Balanced Fund, Source: Author, 2022)

Stocks		Bonds	
ADRO	Level 1	FR0086	Level 1
ASSA	Level 1	INKP01BCN3	Level 1
ARTO	Level 1	Time Deposits	
BBYB	Level 1	Deutsche Bank	Level 1
ERAA	Level 1	Bank Ina Perdana	Level 1
TBIG	Level 1		
HRUM	Level 1		
BOLA	Level 1		
MDKA	Level 1		
EXCL	Level 0		
LINK	Level 1		
AKRA	Level 1		
DSNG	Level 1		
BUKA	Level 1		
TNCA	Level 1		
FREN	Level 1		
DMMX	Level 1		
TFAS	Level 1		
NFCX	Level 1		

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Based on the unit root test table, we can see that the majority assets is at level 1, except for EXCL is at level 0. Means that the stationary data or below 5% will be at level 1 for most data, except for EXCL.

Table 4- 2: Correlogram of Jarvis Balanced Fund Assets in 2021 (Source: Author, 2022)

Stocks		Bonds	
ADRO	2	FR0086	1
ASSA	4	INKP01BCN3	1
ARTO	1	Time Deposits	
BBYB	1	Deutsche Bank	1
ERAA	1	Bank Ina Perdana	5
TBIG	1		
HRUM	4		
BOLA	1		
MDKA	1		
EXCL	1		
LINK	1		
AKRA	2		
DSNG	1		
BUKA	33		
TNCA	3		
FREN	2		
DMMX	1		
TFAS	1		
NFCX	1		

With this correlogram, there will be know about the lag of data. In this research, the author used daily data for 5 years. From this data, the correlogram of BUKA is at 33, followed by Bank Ina Perdana with 5 days lag, HRUM, ASSA at 4 days lag, TNCA with 3 days lag, and ADRO, AKRA, FREN with 2 days lag. The correlogram anomaly is from BUKA, and the others are less than 10. Therefore, the rest of data is stationary.

Table 4- 3: Akaike Info Criterion (Source: Author, 2022)

Financial Assets (Stocks, Bonds, Time Deposits)			
Stocks	METHOD	LAG	AIC
ADRO	AR	2	10,43936
ASSA	MA	4	10,7512
ARTO	ARMA	1	13,96904
BBYB	AR	1	10,25972
ERAA	AR	1	7,827616
TBIG	ARMA	1	10,39978
HRUM	AR	4	10,0716
BOLA	ARMA	1	8,704325
MDKA	MA	1	11,29764
EXCL	ARMA	1	11,36428
LINK	ARMA	1	11,41495
AKRA	MA	2	8,802407
DSNG	ARMA	1	7,830306
BUKA	MA	33	8,782577
TNCA	MA	3	11,72567
FREN	ARMA	2	6,594864
DMMX	ARMA	1	10,56214
TFAS	ARMA	1	12,75683
NFCX	ARMA	1	13,22334
Bonds			
FR0086	AR	1	1,368839
INKP01BCN3	MA	1	-0,83673
Time Deposits			
Deutsche Bank	NA	1	N/A
Bank Ina Perdana	AR	5	-0,400078

After the data is stationary, the next step is to find the ARMA Model. The decisions will be from the smallest amount of Akaike Info Criterion. According to the Akaike Info Criterion table, this has been list from the smallest amount of AIC. With this data, the

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negative AIC is from INKP01BCN3 and Bank Ina Perdana. But, the Deutsche Bank data is not applicable for AR, MA, and ARMA model. Therefore, the data of Deutsche Bank can't be continued.
After looking at the ARMA model, the next step is analyzing the Heteroskedasticity ARCH Model. From the table, this is the data of Heteroskedasticity Test ARCH Model (F-Value).

Table 4- 4: Heteroskedasticity Test ARCH (Source: Author, 2022)

Financial Assets (Stocks, Bonds, Time Deposits)		
Stocks	METHOD	Heteros. Test ARCH (F-Value)
ADRO	AR	0,000000
ASSA	MA	0,000000
ARTO	ARMA	0,000000
BBYB	AR	0,000000
ERAA	AR	0,000000
TBIG	ARMA	0,000000
HRUM	AR	0,000000
BOLA	ARMA	0,000000
MDKA	MA	0,000000
EXCL	ARMA	0,039300
LINK	ARMA	0,000000
AKRA	MA	0,000000
DSNG	ARMA	0,000000
BUKA	MA	0,000000
TNCA	MA	0,037400
FREN	ARMA	0,000000
DMMX	ARMA	0,000000
TFAS	ARMA	0,000000
NFCX	ARMA	0,000000
Bonds		
FR0086	AR	0,000000
INKP01BCN3	MA	0,089000
Time Deposits		
Deutsche Bank	N/A	N/A
Bank Ina Perdana	AR	0,1954

With this data, the heteroskedasticity data ARCH Model (F-Value) should be less than 5% or 0.05. In this data, the majority is showing 0.0000, except for EXCL (0.0393), TCNA (0.0374), INKP01BCN3(0.089) and Bank Ina Perdana (0.1954). From the f-value, Bank Ina Perdana and INKP01BCN3 should be eliminated, because the f-value has been more than 5%.
Another step is looking at the GARCH (1,1) model.

Table 4- 5: GARCH (1,1) Model (Source: Author, 2022)

Financial Assets (Stocks, Bonds, Time Deposits)			
Stocks	GARCH (-1) p-value	C	AIC
ADRO	0,000000	0,0019	10,0124
ASSA	0,000000	0,0000	0,0000
ARTO	0,000000	0,0000	10,9253
BBYB	0,000000	0,0000	8,2382
ERAA	0,000000	0,0000	7,3658
TBIG	0,000000	0,0000	9,9035
HRUM	0,000000	0,0315	8,4008
BOLA	0,000000	0,0000	7,6731
MDKA	0,000000	0,0000	9,8774
EXCL	0,039300	0,0020	11,3643
LINK	0,000000	0,0000	11,3108
AKRA	0,000000	0,0087	8,6900
DSNG	0,000000	0,0000	7,5962
BUKA	0,000000	0,6298	8,4801
TNCA	0,037400	0,1503	10,9236
FREN	0,000000	0,0000	5,6490
DMMX	0,000000	0,0000	9,1988
TFAS	0,000000	0,0000	10,2830
NFCX	0,000000	0,3248	12,2077
Bonds			
FR0086	0,000000	0,00000	1,1223
INKP01BCN3	0,089000	N/A	N/A
Time Deposits			
Deutsche Bank	N/A	N/A	N/A
Bank Ina Perdana	0,1954	N/A	N/A

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In this data, we can see that the GARCH Model is applied to 19 stocks and FR0086. From the p-value of GARCH (1,1) model, the EXCL and TNCA is showing amount of numbers (0.0393 and 0.0374). From the constanta, it should be less than 5%. BUKA showed 0.6298, TNCA is at 0.1503, and NFCX is at 0.3248.
The next step is finding the heteroskedasticity test GARCH (1,1) model. The heteroskedasticity test shows value more than 5% or 0.05. From the data, we will see below:

Table 4- 6: Heteroskedasticity Test GARCH (1,1) Model (Source: Author, 2022)

Financial Assets (Stocks, Bonds, Time Deposits)		
Stocks	F-Value	Prob. Chi-Square
ADRO	0,6558	0,6555
ASSA	0,6215	0,6213
ARTO	0,0006	0,0006
BBYB	0,3524	0,3521
ERAA	0,4759	0,4755
TBIG	0,0017	0,0017
HRUM	0,0509	0,0509
BOLA	0,1788	0,1784
MDKA	0,6417	0,6414
EXCL	0,9853	0,9853
LINK	0,2784	0,2781
AKRA	0,4075	0,4071
DSNG	0,9323	0,9323
BUKA	0,9108	0,9104
TNCA	0,7743	0,7729
FREN	0,1349	0,1347
DMMX	0,2887	0,2883
TFAS	0,3639	0,3632
NFCX	0,0000	0,0000
Bonds		
FR0086	0,421	0,4182

As we can see from the table, the f-value of ARTO, TBIG, and NFCX has value for less than 5% or <0.05, but the rest is more than 5%. From this data, we will eliminate the heteroskedasticity data, that is ARTO, TBIG, and NFCX.
After the step of heteroskedasticity test GARCH (1,1) model, we can predict the volatility through the total of residual value (-1)^2 and GARCH (-1)^2. The data as below:

Table 4- 7: Total Volatility (from Residual (-1)^2 & GARCH (-1)^2 (Source: Author, 2022)

Financial Assets (Stocks, Bonds, Time Deposits)			
Stocks	Resid (-1)^2	GARCH (-1)^2	Total
ADRO	0,045214	0,953615	0,998829
ASSA	0,183552	0,848490	1,032042
BBYB	0,156606	0,874974	1,031580
ERAA	0,059860	0,945022	1,004882
HRUM	0,089722	0,930123	1,019845
BOLA	0,301570	0,770971	1,072541
MDKA	0,145590	0,873291	1,018881
EXCL	0,047339	0,877814	0,925153
LINK	0,148927	0,739142	0,888069
AKRA	0,029657	0,965451	0,995108
DSNG	0,384815	0,505291	0,890106
BUKA	0,024889	0,969020	0,993909
TNCA	0,323377	0,718992	1,042369
FREN	0,054235	0,952083	1,006318
DMMX	0,138722	0,873188	1,011910
TFAS	1,056248	0,618477	1,674725
FR0086	0,276054	0,638954	0,915008

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The data shows the total of residual added by GARCH results. If it shows more than 1, it will be more volatile assets. In this analysis, the total for more than 1 are ASSA, BBYB, ERAA, HRUM, BOLA, MDKA, TNCA, FREN, DMMX, TFAS. This is the list of stocks that will have a chance to be more volatile, based on GARCH (1,1) model calculation (Resid (1)^2 + GARCH (-1)^2). The least total is from LINK (0,888069) and DSNG (0,890106), and FR0086 (0,915008). For EXCL, ADRO, AKRA, BUKA, it's near to the number of 1.

2) Business Solutions

From this previous holding on Jarvis Balanced Fund 2021 and from the calculation of total volatility, ASSA, BBYB, ERAA, HRUM, BOLA, MDKA, TNCA, FREN, DMMX, TFAS should be reduced from portfolio. From the macro economy perspectives, with the high inflation that happens in Indonesia since 2022, the risk-on assets should be reduced and looking for the risk-free assets, such as time deposits.

Table 4- 8: Previous Holdings on Jarvis Balanced Fund (2021) (Source: Author, 2022)

JBF (2021)	
Equity	
ADRO	8,85%
ASSA	8,77%
ARTO	7,92%
BBYB	7,90%
ERAA	6,15%
TBIG	4,77%
HRUM	4,52%
BOLA	4,30%
MDKA	4,26%
EXCL	4,23%
LINK	3,91%
AKRA	3,74%
DSNG	2,74%
BUKA	2,24%
TNCA	1,46%
FREN	1,05%
DMMX	0,08%
TFAS	0,08%
NFCX	0,05%
FREN-W2	2,93%
Total Stocks	79,95%

Bonds	
FR0086	1,26%
INKP01BCN3	0,16%
Total Bonds	1,42%
Time Deposit	
Deutsche Bank	9,31%
Bank Ina Perdana	9,32%
Total TD	18,63%
Total asset	100,00%

Table 4- 9: Portfolio Rebalancing of Jarvis Balanced Fund

Equity	Proportions	Total
ADRO	8,85%	
EXCL	4,23%	
AKRA	3,74%	
DSNG	2,74%	19,56%
Subtotal	19,56%	
Bonds		
FR0086	1,26%	
INKP01BCN3	0,16%	1,42%
Subtotal	1,42%	
Time Deposit		
Deutsche Bank	39,51%	
Bank Ina Perdana	39,52%	79,02%
Subtotal	79,02%	
Total		100,00%

With the analysis from GARCH model, the proposed portfolio rebalancing should be as the table above. The composition of stocks is 19.36% with ADRO, EXCL, AKRA, DSNG. Bonds with 1.42% with FR0086 at 1.26% of portfolio and INKP01BCN3 with

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0.16% of portfolio. The composition of time deposit is at 79.02% with Deutsche Bank is at 39.51% and Bank Ina Perdana at 39.51%. The composition of majority in time deposit gives Jarvis Balanced Fund an option of risk-free assets. While Jarvis Balanced Fund put their fund into risk-free assets, they can find the undervalue company with strong balance sheets and a major story in the year of 2023.

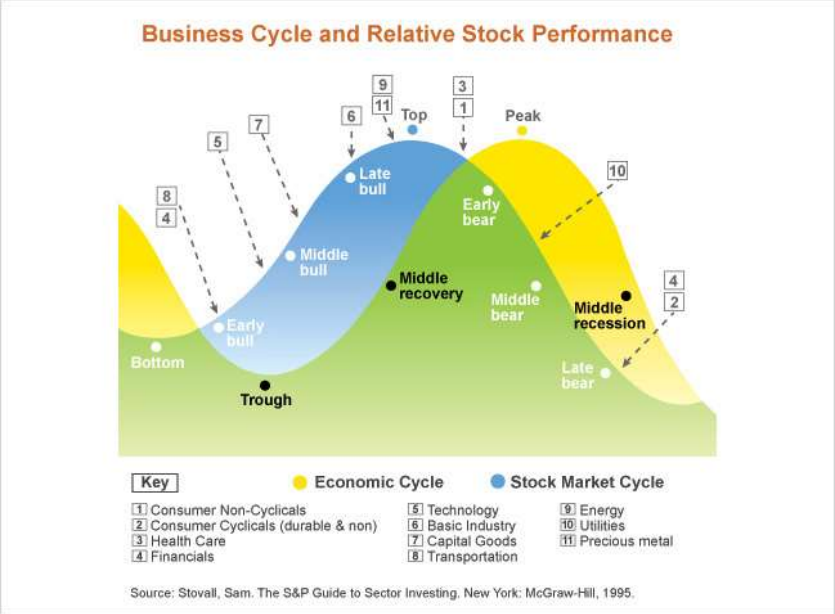

Figure 4-1: Business Cycle (Source: McGrawHill)

According to the business cycle, there are economic cycle and stock market cycle. From stock market cycle, technology sector is at number 5 or the trough positions at economic cycle. With the economic recovery, the current condition of economy is at the middle of recovery until it reach the peak of economic cycle. The recovery shows more demand to the merchandise and tend to be a high inflation. With high inflation, technology sectors are suffering because they need to pay their capital with low interest. With this cycle, technology sectors (BUKA, LINK, DMMX, TFAS, NFCX) are not suitable for the portfolio.

Dalam Miliaran IDR	Q3 2022	Q2 2022	Q1 2022	Q4 2021	Q3 2021	Q2 2021
Total Pendapatan	898 B	903 B	788 B	521 B	484 B	440 B
Total Beban Pokok Penjualan	(650) B	(654) B	(510) B	(233) B	(90) B	(41) B
Laba Kotor	**248 B**	**249 B**	**278 B**	**288 B**	**394 B**	**399 B**
Total Beban Usaha	(5,321) B	(6,064) B	14,143 B	(782) B	(834) B	(847) B
Laba Usaha	**(5,072) B**	**(5,815) B**	**14,421 B**	**(493) B**	**(440) B**	**(448) B**
Penghasilan/Beban Lain-Lain	126 B	91 B	102 B	117 B	84 B	5 B
Laba Sebelum Pajak	**(4,947) B**	**(5,724) B**	**14,523 B**	**(376) B**	**(356) B**	**(443) B**
Beban Pajak Penghasilan	(25) B	(235) B	27 B	(172) B	(5) B	(0) B
Laba Bersih Tahun Berjalan	**(4,972) B**	**(5,959) B**	**14,549 B**	**(548) B**	**(361) B**	**(443) B**
Pendapatan Komprehensif Lain	(55) B	(5) B	(0) B	(3) B	(1) B	-
Jumlah Laba Komprehensif	**(5,027) B**	**(5,964) B**	**14,549 B**	**(550) B**	**(362) B**	**(443) B**
Laba Bersih Yang Dapat Diatribu...	**(4,972) B**	**(5,959) B**	**14,549 B**	**(548) B**	**(361) B**	**(443) B**
Laba Komprehensif Yang Dapat Di...	(5,027) B	(5,964) B	14,549 B	(550) B	(362) B	(443) B

Figure 4-2: Income Statement from BUKA:JK (Source: Stockbit)

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 02 February 2023
DOI: 10.47191/ijcsrr/V6-i2-56, Impact Factor: 5.995
IJCSRR @ 2023
www.ijcsrr.org

Dalam Miliaran IDR	Q3 2022	Q2 2022	Q1 2022	Q4 2021	Q3 2021	Q2 2021	Q1 2021
Aset							
Aset Lancar							
Kas Dan Setara Kas	17,037 B	19,515 B	19,967 B	24,700 B	23,638 B	2,728 B	1,690 B
Piutang Usaha	103 B	113 B	110 B	54 B	217 B	214 B	193 B
Piutang Lain-Lain	117 B	71 B	56 B	55 B	47 B	49 B	14 B
Persediaan	40 B	35 B	25 B	1 B	1 B	1 B	-
Others	6,828 B	10,854 B	15,946 B	1,039 B	254 B	125 B	90 B
Total Aset Lancar	**24,125 B**	**30,588 B**	**36,105 B**	**25,849 B**	**24,157 B**	**3,117 B**	**1,986 B**
Aset Tidak Lancar							
Aset Tetap	26 B	37 B	49 B	69 B	88 B	179 B	218 B
Aset Pajak Tanggahan	65 B	88 B	321 B	295 B	443 B	478 B	478 B
Investasi Pada Entitas A...	763 B	771 B	775 B	-	-	-	-
Aset Tak Berwujud	52 B	55 B	60 B	53 B	138 B	2 B	2 B
Goodwill	300 B	290 B	285 B	216 B	72 B	187 B	-
Others	3,735 B	1,994 B	2,329 B	123 B	122 B	81 B	67 B
Total Aset Tidak Lancar	**4,941 B**	**3,235 B**	**3,819 B**	**767 B**	**862 B**	**927 B**	**765 B**
Total Aset	**29,065 B**	**33,823 B**	**39,923 B**	**26,616 B**	**25,020 B**	**4,044 B**	**2,751 B**
Liabilitas Dan Ekuitas							
Liabilitas							
Liabilitas Jangka Pendek	1,631 B	1,467 B	1,685 B	3,007 B	965 B	927 B	946 B
Liabilitas Jangka Panjan...	166 B	133 B	115 B	112 B	102 B	101 B	99 B
Total Liabilitas	**1,797 B**	**1,599 B**	**1,800 B**	**3,120 B**	**1,067 B**	**1,028 B**	**1,045 B**
Ekuitas	27,268 B	32,224 B	38,123 B	23,496 B	23,952 B	3,016 B	1,706 B
Total Liabilitas Dan Ekuitas	**29,065 B**	**33,823 B**	**39,923 B**	**26,616 B**	**25,020 B**	**4,044 B**	**2,751 B**
Saham Beredar	**103 B**	**103 B**	**103 B**	**103 B**	**103 B**	**77 B**	**0 B**

Figure 4-3: Balance Sheets from BUKA:JK (Source: Stockbit)

PT. Bukalapak, Tbk. (BUKA:JK) is a company that runs in ecommerce business model in Indonesia. As we can see on quarterly financial report from BUKA, the balance sheet of BUKA in Q3 2022 is heavy on cash, with Rp 17.03 Trillion. The total liabilities from BUKA are Rp 1.79 Trillion. Which we can count the ratio of cash and liabilities are 950%, but for another ratio (debt ratio) is 6.18%. It shows a great amount of cash that could cover the debt in PT. Bukalapak, Tbk. (BUKA:JK). On the other hand, the income statement showed operating loss from Q2 2021 to Q3 2022. The operating expenses included selling expense, selling general & administrative expenses (SG&A expense), and other expenses. The huge amount of expense is on other expense with Rp 4.56 Trillion in Q3 2022, compared to the gross profit of Rp 248 Billion in the same period. From Q2 2021 to Q3 2022, BUKA showed operating loss for each quarter, except for Q1 2022 from the net investment of BUKA that gains about Rp 15.49 Trillion. That made BUKA had a lot of cash, but not from their business model. Until now, they still improve to get the positive EBITDA and the next target of positive net income in current years ahead.

Dalam Miliaran IDR	Q3 2022	Q2 2022	Q1 2022	Q4 2021	Q3 2021	Q2 2021
Total Pendapatan	1,081 B	1,058 B	1,052 B	1,223 B	1,086 B	1,087 B
Total Beban Pokok Penjualan	(210) B	(185) B	(200) B	(302) B	(220) B	(227) B
Laba Kotor	**870 B**	**873 B**	**852 B**	**921 B**	**866 B**	**860 B**
Total Beban Usaha	(669) B	(774) B	(614) B	(607) B	(534) B	(525) B
Laba Usaha	**201 B**	**98 B**	**238 B**	**315 B**	**332 B**	**335 B**
Penghasilan/Beban Lain-Lain	(65) B	(74) B	(63) B	(56) B	(55) B	(45) B
Laba Sebelum Pajak	**136 B**	**25 B**	**175 B**	**259 B**	**277 B**	**290 B**
Beban Pajak Penghasilan	(31) B	(11) B	(46) B	(60) B	(61) B	(67) B
Laba Bersih Dari Operasi Yang D...	105 B	13 B	128 B	198 B	215 B	223 B
Penyesuaian Proforma	-	-	-	-	-	-
Laba Bersih Tahun Berjalan	**105 B**	**13 B**	**128 B**	**198 B**	**215 B**	**223 B**
Pendapatan Komprehensif Lain	1 B	6 B		19 B		5 B
Jumlah Laba Komprehensif	**106 B**	**20 B**	**128 B**	**217 B**	**215 B**	**228 B**
Laba Bersih Yang Dapat Diatribu...	**105 B**	**13 B**	**128 B**	**198 B**	**215 B**	**223 B**
Laba Komprehensif Yang Dapat Di...	106 B	20 B	128 B	217 B	215 B	228 B

Figure 4-4: Income Statement of LINK:JK (Source: Stockbit)

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 02 February 2023
DOI: 10.47191/ijcsrr/V6-i2-56, Impact Factor: 5.995
IJCSRR @ 2023
www.ijcsrr.org

Dalam Miliaran IDR	Q3 2022	Q2 2022	Q1 2022	Q4 2021	Q3 2021	Q2 2021	Q1 2021
Aset							
Aset Lancar							
Kas Dan Setara Kas	152 B	163 B	247 B	271 B	426 B	281 B	1,248 B
Piutang Usaha	435 B	400 B	408 B	443 B	329 B	333 B	286 B
Others	178 B	446 B	140 B	147 B	168 B	200 B	128 B
Total Aset Lancar	765 B	1,009 B	846 B	861 B	923 B	814 B	1,661 B
Aset Tidak Lancar							
Piutang Usaha	11 B	11 B	11 B	11 B	12 B	12 B	12 B
Investasi Pada Entitas A...	-	-	-	-	-	-	-
Aset Pajak Tangguhan	126 B	117 B	102 B	94 B	86 B	103 B	103 B
Aset Tetap	7,602 B	7,283 B	7,081 B	6,770 B	6,548 B	6,097 B	5,808 B
Aset Tak Berwujud	144 B	134 B	128 B	123 B	113 B	108 B	115 B
Others	2,444 B	2,367 B	2,124 B	1,879 B	1,607 B	1,456 B	1,409 B
Total Aset Tidak Lancar	10,328 B	9,712 B	9,457 B	8,886 B	8,365 B	7,775 B	7,447 B
Total Aset	11,093 B	10,721 B	10,303 B	9,747 B	9,288 B	8,589 B	9,108 B
Liabilitas Dan Ekuitas							
Liabilitas							
Liabilitas Jangka Pendek	4,454 B	4,078 B	2,498 B	1,964 B	1,838 B	1,443 B	2,833 B
Liabilitas Jangka Panjan...	1,136 B	1,246 B	2,427 B	2,533 B	2,418 B	2,329 B	1,403 B
Total Liabilitas	5,590 B	5,324 B	4,925 B	4,498 B	4,256 B	3,772 B	4,237 B
Ekuitas	5,503 B	5,397 B	5,377 B	5,249 B	5,032 B	4,817 B	4,872 B
Total Liabilitas Dan Ekuitas	11,093 B	10,721 B	10,303 B	9,747 B	9,288 B	8,589 B	9,108 B
Saham Beredar	3 B	3 B	3 B	3 B	3 B	3 B	3 B

Figure 4- 1: Balance Sheet of LINK:JK (Source: Stockbit)

PT Link Net, Tbk. (LINK:JK), is a company that runs with broadband communication network including television programs and high speed internet through the network in Jakarta, Bogor, Tangerang, Bekasi, Surabaya, Bali, and Bandung areas. The sectors for LINK are technology sectors. With the information about income statement and balance sheets of LINK, the balance sheets are strong, and LINK have produced positive net income in their business model of serving broadband communication network. Unfortunately, the sectors are on bearish terms, because of high interest rate on 2022 and other year, until the macro-economy shows recovery on interest rate.

In this portfolio rebalancing model, the lesser volatility, the better for Jarvis Balanced Fund. With less number of stocks, and added more proportions on time deposits, it will secure JBF money in a few quarter of 2023 to purchase stocks from the bottom price. Otherwise, the stock that kept will fall from the current price and the demand of Jarvis Balanced Fund will be decreased in the next few quarters. Choosing the right asset for JBF is important to maintain customer and attract new customers with survival conditions of Jarvis Balanced Fund.

3) Implementation Plan

The plan is to reduce the portion of stock portfolio and add time deposits in the portfolio. The plan should be implemented before 2023 or in the year of 2023, because asset management has time to do the plan before another investor anticipated the action of big funds to exit the stock market. Looking at these current economic conditions, it will be better to do it early.

While the asset management exit the market, they will have time to do the valuations entry the stock market at a discounted price. Looking at the risk-on assets will take time, because not only the statistics from econometrics (GARCH Model), but also the stock valuations and business sectoral cycle will help asset management to purchase new assets again. One of the solutions is to put the money on time deposits. As for the econometric tools (GARCH Model), it will help their decision to find the volatility movements, alongside their valuations model. The combination of valuations and econometrics will give a new insight into stock market return and volatility.

CONCLUSIONS

From this analysis, the author concluded that the asset is having more volatility, especially for stocks and FR (government bonds). For corporate bonds (INKP01BCN3) it must be stopped in heteroskedasticity ARCH (0.089 > 0.05) and other time deposits, it has to be stopped on ARMA model (Deutsche Bank) and heteroskedasticity ARCH (Bank Ina Perdana: 0,1954 > 0.05).

The volatility is on the ASSA, BBYB, ERAA, HRUM, BOLA, MDKA, TNCA, FREN, DMMX, TFAS with total value for more than 1. The other stocks (EXCL, ADRO, AKRA, BUKA) are near 1, with value of more than 0.9. But for LINK, DSNG, and FR0086 is less than 0.9. So, it's less volatile, but it will have a chance for less return.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 02 February 2023
DOI: 10.47191/ijcsrr/V6-i2-56, Impact Factor: 5.995
IJCSRR @ 2023
www.ijcsrr.org

With this model, high risk came with the high return. To make it less risky for capital loss, it's suggested to decreasing the stocks and add more of government bonds and time deposits. With this forecast, the high volatility had a chance to bring the capital loss into the assets.

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Cite this Article: Irvan Liunardi Senjaya, Dr. Erman Sumirat, S.E, M.Buss, CSA, CRP, CIB, AK., Prof. Dr. Ir. Sudarso Kaderi Wiryono, DEA. (2023). Portfolio Rebalancing with GARCH Model at Jarvis Balanced Fund. International Journal of Current Science Research and Review, 6(2), 1362-1373