Table 2. Variance Inflation Factor Value

Model	Collinearity Statistics	
	Tolerance	VIF
X_1	0.121	8.248
X_2	0.002	419.722
X_3	0.070	14.224
X_4	0.003	369.514

According to Table 2 above can be seen the independent variables X_1, X_2 and X_3 have $VIF \geq 10$ values which means that there are multicollinearity problems between independent variables.

3.2 Analysis of Indonesian Foreign Exchange Deposit Data with LASSO Method

Calculation of LASSO method for data is done using R Studio software. So that the LASSO coefficient estimator can be seen in Table 3 below:

Table 3. LASSO Parameters

	$\hat{\beta}_{LASSO}$			
i	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$
1	0	0	0	0
2	0	2.436433394	0	0
3	0	4.083652931	0	1.647219537
4	0	0	1.026443672	5.404790046
5	0	0	1.949173288	6.327519662
6	-1.807590278	0	1.332465393	8.620270647
7	-3.725070268	-25.33779207	5.07550663	32.39543664

Based on Table 3 it can be seen in the iteration of $i = 4$ variable X_2 shrinks to 0 because it violates the LARS algorithm limiter on LASSO. The $\hat{\beta}_{LASSO}$ value used transformed data, the value of $\hat{\beta}_{LASSO}$ is returned to the actual data with equation (12). The value of $\hat{\beta}^*_{LASSO}$ in Table 4 is as follows:

Table 4. Real LASSO Parameters

	$\hat{\beta}^*_{LASSO}$			
i	$\hat{\beta}^*_1$	$\hat{\beta}^*_2$	$\hat{\beta}^*_3$	$\hat{\beta}^*_4$
1	0	0	0	0
2	0	0.013498285	0	0
3	0	0.022624182	0	0.000674437
4	0	0	0.021035528	0.002212935
5	0	0	0.039945581	0.002590737
6	-0.037538261	0	0.027307015	0.00352948
7	-0.077358603	-0.14037599	0.104015412	0.013263973

Table 4 is the coefficient value of the LASS parameter using the RStudio program. Next is choosing the best model using the Mallow's C_p statistic in equation (6) presented in Table 5 as follows:

Table 5. Mallow's C_p Value

i	Cp
1	372.7238179
2	192.6608913
3	49.84910785
4	33.56544442
5	13.16500572
6	11.32731788
7	5

Based on Table 5 the model that will be used is a model with the smallest Mallow's C_p value that is found in the iteration to i $= 7$.

3.3   Model Regresi dari Metode LASSO Regression

Based on Table 4 and Table 5 can be obtained the model of LASSO method as follows:

$$\hat{Y} = -0.077358603X_1 - 0.14037599X_2 + 0.104015412X_3 + 0.013263973X_4$$

The meaning of the model above is if net foreign assets increase by one trillion, the value of Indonesia's foreign exchange deposits will decrease by 0.077358603 or 7.7358603%. As with net domestic assets, if there is an increase of one trillion, the value of Indonesia's foreign exchange deposits will decrease by 0.14037599 or 1.4037599%. Different from the net bill to the central government, if it experiences an increase of one trillion, the value of Indonesia's foreign exchange deposit will increase by 0.104015412 or 1.04015412%. While bills to other sectors, if there is an increase of one trillion, the value of Indonesia's foreign exchange deposits will increase by 0.013263973 or 1.3263973%.

4. Conclusions

In this paper we have analyzed the LASSO method parameter can be specified with LARS algorithm which calculates correlation vector, the largest absolute correlation value, equiangular vector, inner product vector, and determines the LARS algorithm limiter for LASSO. The model of LASSO method as follows:

$$\hat{Y} = -0.077358603X_1 - 0.14037599X_2 + 0.104015412X_3 + 0.013263973X_4$$

Base on model if net foreign assets increase by one trillion, the value of Indonesia's foreign exchange deposits will decrease by 0.077358603 or 7.7358603%. As with net domestic assets, if there is an increase of one trillion, the value of Indonesia's foreign exchange deposits will decrease by 0.14037599 or 1.4037599%. Different from the net bill to the central government, if it experiences an increase of one trillion, the value of Indonesia's foreign exchange deposit will increase by 0.104015412 or 1.04015412%. While bills to other sectors, if there is an increase of one trillion, the value of Indonesia's foreign exchange deposits will increase by 0.013263973 or 1.3263973%.

Acknowledgements

References

Alauddin, Mohammad, and Hong Son Nghiemb. 2010. "Do Instructional Attributes Pose Multicollinearity Problems ? An Empirical Exploration." Economic Analysis and Policy 40(3): 351–61.

Arthur, David Ebuka et al. 2018. "Journal of King Saud University – Science Activity and Toxicity Modelling of Some NCI Selected Compounds against Leukemia P388ADR Cell Line Using Genetic Algorithm-Multiple Linear Regressions." *Journal of King Saud University - Science*.

Chen, Hongmei, and Yaoxin Xiang. 2017. "ScienceDirect The Study of Credit Scoring Model Based on Group Lasso." *Procedia Computer Science* 122: 677–84.

Dyar, M D et al. 2012. "Spectrochimica Acta Part B Comparison of Partial Least Squares and Lasso Regression Techniques as Applied to Laser-Induced Breakdown Spectroscopy of Geological Samples." *Spectrochimica Acta Part B: Atomic Spectroscopy* 70: 51–67

Gauthier, Philippe-aubert, William Scullion, and Alain Berry. 2017. "Sound Quality Prediction Based on Systematic Metric Selection and Shrinkage : Comparison of Stepwise , Lasso , and Elastic-Net Algorithms and Clustering Preprocessing." *Journal of Sound and Vibration* 400: 134–53.

Hastie T, Efron B, Johnstone I, Tibshirani R. 2004. Least Angle Regression. Annals of Statistics, 32(2): 407-499.

Jansen, Maarten. 2015. "Journal of Statistical Planning and Inference Generalized Cross Validation in Variable Selection with and without Shrinkage." *Journal of Statistical Planning and Inference*

Kazemi, A, A Mohamed, H Shareef, and H Zayandehroodi. 2013. "Electrical Power and Energy Systems Optimal Power Quality Monitor Placement Using Genetic Algorithm and Mallow ' s Cp." *International Journal of Electrical Power and Energy Systems* 53: 564–75.

Kutner, M.H., C.J. Nachtsheim., dan J. Neter. 2004. Applied Linear Regression Models. 4th ed. New York: McGraw-Hill Companies, Inc.

Lee, Sudong, and Chi-hyuck Jun. 2017. "PT US CR." *Expert Systems With Applications*.

Lorchirachoonkul, Vichit, and Jirawan Jitthavech. 2012. "Journal of Statistical Planning and Inference A Modified C p Statistic in a System-of-Equations Model." *Journal of Statistical Planning and Inference* 142(8): 2386–94.

Miyashiro, Ryuhei, and Yuichi Takano. 2015. "Expert Systems with Applications Subset Selection by Mallow's Cp : A Mixed Integer Programming Approach." EXPERT SYSTEMS WITH APPLICATIONS 42(1): 325–31.

Permai, Syarifah Diana, and Heruna Tanty. 2018. "ScienceDirect ScienceDirect Linear Regression Model Using Bayesian Approach for Energy Linear Regression Model Using Bayesian Approach for Energy Performance of Residential Building Performance of Residential Building." *Procedia Computer Science* 135: 671–77.

Sermpinis, Georgios, Serafeim Tsoukas, and Ping Zhang. 2018. "Modelling Market Implied Ratings Using LASSO Variable Selection Techniques." *Journal of Empirical Finance* 48(May): 19–35.

Tibshirani R. 1996. Regression Shrinkage and Selection via the LASSO. *Journal of Royal Statistical Society*, Series B, 58(1): 267-288.

Wang, Shengzheng et al. 2017. "Predicting Ship Fuel Consumption Based on LASSO Regression." *Transportation Research Part D.*

Zhang, Long, and Kang Li. 2015. "Automatica Forward and Backward Least Angle Regression for Nonlinear Zhou, Xiao-ping, and Xiao-cheng Huang. 2018. "Reliability Analysis of Slopes Using UD-Based Response Surface Methods Combined with LASSO." *Engineering Geology* 233(June 2017): 111–23.System." *Automatica* 53: 94–102.

Biographies

Trisha M A Januaviani is a graduate of Mathematics at Universitas Padjadjaran with honors in 2017. Miss Januaviani is currently continuing her studies in The Master Program in Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran.

Nurul Gusriani is a lecturer in the Department of Program in Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Mrs. Gusriani is a graduate of the Masters Program in Statistic, Bogor Agricultural University. Mrs Gusriani has published various journals in statistics especially in ridge regression, telbs regression, markov chains and others

Khafsah Joebaedi is a lecturer in the Department of Program in Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Mrs. Khafsah has published various journals in mathematics especially in topology, space time autoregression (STAR) and banach space.

Sukono is a lecturer in the Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Currently serves as Head of Master's Program in Mathematics, the field of applied mathematics, with a field of concentration of financial mathematics and actuarial sciences.

Subiyanto is a lecturer in the Department of Marine Science, Faculty of Fishery and Marine Science, Universitas Padjadjaran. He received his Ph.D in School of Ocean Engineering from Universiti Malaysia Terengganu (UMT), Malaysia in 2017. His research focuses on applied mathematics, numerical analysis and computational science.

Abdul Talib Bon is a professor of Production and Operations Management in the Faculty of Technology Management and Business at the Universiti Tun Hussein Onn Malaysia since 1999. He has a PhD in Computer Science, which he obtained from the Universite de La Rochelle, France in the year 2008. His doctoral thesis was on topic Process Quality Improvement on Beltline Moulding Manufacturing. He studied Business Administration in the Universiti Kebangsaan Malaysia for which he was awarded the MBA in the year 1998. He's bachelor degree and diploma in Mechanical Engineering which his obtained from the Universiti Teknologi Malaysia. He received his postgraduate certificate in Mechatronics and Robotics from Carlisle, United Kingdom in 1997. He had published more 150 International Proceedings and International Journals and 8 books. He is a member of MSORSM, IIF, IEOM, IIE, INFORMS, TAM and MIM.
.