

one strategy to reduce rice price fluctuations by equalizing inter-island trade through more even distribution of products between regions [25].

In general, from the analysis of the spatial integration model of the Indonesian rice market, it can be said that there is a horizontal correlation between rice trade inter-region. Spatial rice market integration has occurred in the short and long term in the incomplete integrated rice market. This can be seen from the relationship between variables or markets where not all markets are connected. Even in the long run, there is still an independent rice market. The coefficient values of models which are smaller than one indicates a weak level of integration, meaning that the level of efficiency of the Indonesian rice market is still low. The geographic condition of the Indonesia archipelago causes perfect market integration to be difficult to achieve. The rice market will be segmented into several regions due to differences in location and infrastructure conditions of each region in adjusting to price changes.

Although the integration of the Indonesian rice market is imperfect, reflecting the low level of market efficiency, it can be concluded from the results of the analysis that there are regions or central points that are determinants or market rulers. This means that controlling the rice market in Indonesia does not require controlling the entire rice market spreading throughout Indonesia and can not also be concentrated at one point, but control must be done at the determinants market spread across every island in Indonesia. This is done because of the different rice market behavior in each location. There are six locations or central points, namely: North Sumatra and South Sumatra with rice trade flow in the western part of Indonesia; DKI Jakarta and Central Java with rice trade flow in the central and west part of Indonesia; East Java with rice trade flows in central and eastern Indonesia, and South Sulawesi with rice trade flows in eastern Indonesia.

IV. CONCLUSION

This paper proposes a novel concept of island economics in the Indonesian rice market, which is inefficient based on the imperfect analysis of market integration. This means that rice prices between regions have not fully moved in the same direction and magnitude. Indonesia's archipelago geographical conditions make it difficult to achieve the perfect integration of the rice market. Horizontal market integration is segmented into several points in some areas. The implementation of rice policies will be efficient if policies are developed and implemented based on specific commodities for the location or province of the determinants of market authorities. The efficient determination of the rice market will impact the market efficiency of rice in other areas that are linked or integrated. This study is limited to analyze the inter-island and inter-provincial rice trade with secondary data from BPS. Future studies are expected to map the flow of goods from the main ports on each island used for the inter-island rice trade and imports.

REFERENCES

[1] (2016) IRRI (International Rice Research Institute) website. World Rice Statistics Online Query Facility. [Online]. Available: <http://ricestat.irri.org:8080/wrsv3/entrypoint.htm>.

- [2] BPS (Central Bureau of Statistics), *Distribution of Indonesian Rice Commodity Trading 2015*, Jakarta, Indonesia, 2015.
- [3] M. Firdaus, L. M. Baga, and P. Pratiwi, *Rice Self-Sufficiency from Time to Time; A Review of the Effectiveness of Policies and Formulation of a National Strategy*. Bogor, Indonesia: Bogor Agricultural University Press, 2008.
- [4] G. Rapsomanikis, D. Hallam, and P. Conforti, "Market Integration and Price Transmission in Selected Food and Cash Markets of Developing Countries: Review and Applications," *Commodity Markets Review* 2003 - 2004, pp.51-75, FAO Commodities and Trade Division, Rome, Italy, 2003.
- [5] F. Yustiningsih, "Analysis of Market Integration and Rice Price Transmission of Farmers-Consumers in Indonesia," M. Si. thesis, Dept. Economics, Indonesia Univ., Jakarta, Indonesia, 2012.
- [6] A. Irawan and D. Rosmayanti, "Analysis of Rice Market Integration in Bengkulu," *Jurnal Agro Ekonomi*, vol. 25, no. 1, pp. 37-54, May 2007.
- [7] S. Bojnec and G. Peter, "Vertical Market Integration and Competition: The Meat Sector in Slovenia," *Agricultural and Food Science*, vol. 14, no. 3, pp. 236-249, 2005.
- [8] D. Dawe and P. Timmer, "Why Stable Food Prices Are a Good Thing: Lesson from Stabilizing Rice Prices in Asia," *Global Food Security*, vol. 1, pp. 127-133, Dec. 2012.
- [9] S. S. Hariadi and A. Yamin, "Rice Policy and the Fate of Small Farmers," in *Rice Economy of Indonesia*. Bogor, Indonesia: Indonesian Agricultural Economy Association, 2014, pp. 351-367.
- [10] P. Conforti, "Price Transmission in Selected Agricultural Markets," Working Paper Commodity and Trade Policy Research, No. 7, FAO, Rome, Italy: March, 2004.
- [11] D. Ethridge, *Research Methodology in Applied Economics*, 2nd ed. Iowa, USA: Blackwell Publishing, 2004.
- [12] G. W. Tomek and K. L. Robinson, *Agricultural Product Prices*. Ithaca, USA: Cornell University Press, 1981.
- [13] R. L. Thomas, *Modern Econometric: An Introduction*. Edinburg Gate, England: Addison-Wesley Longman Limited, 1997.
- [14] A. Widarjo, *Econometrics: Theory and Applications for Economics and Business*. Yogyakarta, Indonesia: Publisher Ekonisia, Faculty of Economics Islamic University of Indonesia, 2007.
- [15] W. Enders, *Applied Econometric Time Series*. New Jersey, USA: John Wiley, 1995.
- [16] W.W. Winarno, *Analytical Econometrics and Statistics with Eviews*. Yogyakarta, Indonesia: Unit Publisher and Printing College Management Science Foundation Family Heroes of the State, 2007.
- [17] C. Anwar, "Indonesia's Natural Rubber Prospect in International Market: An Analysis of Market Integration and Export Performance," Ph.D. dissertation, Postgraduate School, Bogor Agricultural Institute, Bogor, Indonesia, 2005.
- [18] J. Pelkman, *European Integration: Methods and Economic Analysis*, 2nd ed. New Jersey, USA: Prentice-Hall, 2001.
- [19] R. S. Natawidjaja, L. Sulistyowati, L. Setiagustina, H. Sulistyoningrum, G. Rahmalia, and A. Nugraha, "Analysis of Supply and Value Chain of Rice in West Java," Research Cooperation Faculty of Agriculture Padjadjaran University with Bank Indonesia Regional West Java, Bandung, Indonesia, Nov. 2008.
- [20] B. Arifin, Suparmin, and Sugiyono, "Analysis of Indonesian Rice Trading Policy," *Jurnal Sosio Ekonomika*, vol. 12, no. 2, pp. 85-102, Dec. 2006.
- [21] Y. Oktarina, "Analysis of Rice Market Integration in Southern Part of Sumatra," Ph.D. Dissertation, Dept. Agriculture, Universitas Sriwijaya, Palembang, Indonesia, 2013.
- [22] M.W. Hidayanto, L. Anggraeni, and D.B. Hakim, "Determinants of Rice Market Integration in Indonesia," *Pangan*, vol. 23, no. 1, pp. 1-16, March 2014.
- [23] A. Kusumaningsih, Jamhari, and D. H. Darwanto, "Analysis of Rice Price Trend and Vertical Integration of Rice Market in Indonesia," *Agricultural Science*, vol. 1, no. 2, pp. 074-079, August 2016.
- [24] H. Dick, "The Archipelagic Paradox Islands, Cities and The Modern State, 1808-2008," *Economics and Finance in Indonesia*, Vol. 58, No. 1, pp. 37-55, April 2010.
- [25] R. Kustiari, S.H. Susilowati, H. Supriadi, W.K. Sejati, and A. Milindri, "Study on Improvement of Inter-Island Trade Performance in Support of Agricultural Commodity Development," Social Economic and Agriculture Policy Center Agricultural Research and Development Agency Ministry of Agriculture, Bogor, Indonesia, 2016.