Moderating Effects of the Market Environment between Government Intervention and Comparative Advantage of Coconut Farming in Malaysia

Fakhrul Anwar Zainol[1], Wan Norhayate Wan Daud[1], Nalini Arumugam[2], Nurul Aisyah Mohd Suhaimi[2], Balogun Daud Ishola[1]*, and Aida Zairina Ishak[1]

[1]*Faculty of Business and Management, Universiti Sultan Zainal Abidin, Gong Badak Campus, 21300 Kuala Terengganu, Terengganu, Malaysia*
[2]*Faculty of Bioresources and Food Industry, Universiti Sultan Zainal Abidin, Besut Campus, Besut 22200, Kuala Terengganu, Terengganu, Malaysia*

ABSTRACT

The study analysed the moderating effects of the market environment between government intervention and comparative advantage. The research used in this study is quantitative. The information was gathered from coconut growers in 12 Malaysian states. Respondents received the questionnaires through their WhatsApp numbers. Out of the 160 respondents who completed the questionnaires, 130 were selected at random to be analysed using the partial least squares (PLS) and Statistical Package for the Social Sciences (SPSS). The Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to test the study's framework. The hypothesis testing was aided by bootstrapping. The hypothesis testing was supported by t-statistics and path coefficients. This study revealed that the moderation effect of the market environment on the relationship between government intervention and comparative advantage was significant at 10%. These findings offer practitioners actionable frameworks for improving competitiveness, emphasising the importance of both internal decision-making and external environmental factors.

Keywords: Coconut farming, Malaysia, comparative advantage, government intervention, market environment

INTRODUCTION

According to Nayar (2016), the most beneficial plant species for humans is the coconut palm (Cocos nucifera L., family Arecaceae). Since very early times, the entire palm has been used for productive commercial purposes. The coconut has been affected by the start of the Anthropocene

Age, especially for people who live in areas where it is seen as the "staff of life," even though the coconut palm's standing has largely remained unchanged in areas where it is significant. The coconut palm is the most common plant in the littoral zones of the more than 30,000 islands that make up the ancient world's tropical and subtropical oceans. It has been integral to the mythology, folklore, ethnobotany, and everyday lives of the people who live in these vast regions since ancient times (Nayar 2016). 61.4 million metric tonnes of coconut fruit are produced year on 12.3 million hectares of coconut cultivation worldwide (Statista, 2020). The main phase of the planting of coconut trees to export copra and oil was the time between 1900 and 1930 when its price was extremely high. With a 538,685 mt capacity in 2018, Malaysia was the world's 12th-largest producer of coconuts [Selected Agriculture Indicator (SUA 2019)]. Therefore, the study analysed the moderating effects of the market environment between government intervention and comparative advantage.

Theory of Market Failures and Government Intervention

A broader school of Keynesian welfare and macroeconomics, which included the development of the theory of market failure, appeared in the middle of the twentieth century. Among the notable contributors were Paul A. Samuelson, William Baumol, Francis Bator, and Arthur C. Pigou. These theorists were interested in how the results of free markets correlated with the optimisation of social welfare. The "invisible hand" or duality theory of classical economics posits that Pareto optimality and laissez-faire market performance are mutually exclusive.   In response to price signals, producers and consumers decide how to manufacture the product, whether to buy it, and whether to sell it. Correcting market failures can lead to more efficient allocation of resources and better cost-benefit ratios for public investments. Government policies can promote competition, provide information, and support marketing infrastructure to enhance marketing efficiency. By addressing market failures, government intervention can increase the social returns on public investments and private sector activities. The theory suggests government should intervene only when the benefits outweigh the costs and risks of failure. Governments can establish regulatory frameworks that promote fair competition, prevent market power abuse, and ensure that firms operate efficiently and effectively. This can lead to a comparative advantage in industries where firms can adapt more efficiently to changing market conditions. Governments can provide subsidies or tax incentives to firms to invest in specific projects or industries, which can enhance their comparative advantage by reducing costs and increasing competitiveness.

Development of Hypothesis

Market Environment Moderates the Relationship between the government intervention (subsidy) and dependent variable (Comparative Advantage) (Figure 1). Mizik (2021)

argues that the most important factor influencing domestic producers' competitiveness is favourable law and policy, which is followed by more complex and high-value items as well as extremely profitable and efficient production. According to Nagy and Jambor (2019), producing highly processed goods and specialising in producing one or a small number of the competitive goods are the primary drivers of a substantial competitive advantage.

Agricultural policies are a comprehensive set of laws and policies created by the government to accomplish goals outlined in plans for agricultural growth. These objectives are meant to promote greater production to attain food security, self-sufficiency, and a decrease in imports from overseas, which necessitates the payment of foreign funds that could be invested domestically and the improvement of added value to raise revenue and improve the income of workers involved in this activity (Al-Khazraji & Ahmed, 2023). Interestingly, when compared to their closest competitors, India, Pakistan, and Indonesia have consistently improved their fish export competitiveness (Md Ali et al., 2024). The National Shrimp Policy (NSP) has had a short-term detrimental effect on export potential, even if it has succeeded in reaching its objectives of sustainable production and market expansion.

The return on investment obtained with each transaction using the Ichimoku-based technique improved by roughly 8 to 9% in comparison to the pre-pandemic period. The Ichimoku-based approach could somewhat increase the cumulative return approach is less risky than the buy-and-hold approach (Che-Ngoc et al., 2023). Nandini and Samal (2020) assessed the profitability of technical indicators such the Simple Moving Average, Exponential Moving Average, and Moving Average in connection to COVID19. For the Malaysian stock market, the performance of six moving average (MA) criteria was examined by Lee (2020). They use utility indicators, return on equity, and policyholder internal rate of return to evaluate which market configurations, under low interest rates, optimise the return tradeoff for both stakeholders.

Higher contrarian profitability is associated with times when the market is trending upward, when market volatility and liquidity are higher, and when macroeconomic uncertainty is lower. Considering this, dates account for a sizable amount of Iraq's
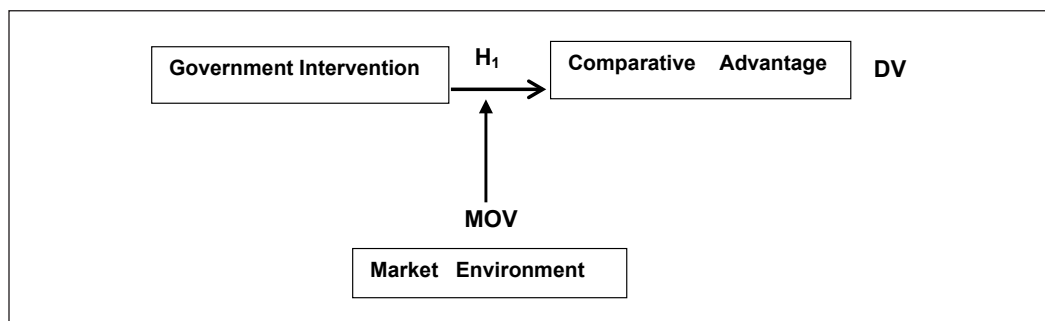

Figure 1. Conceptual framework

agricultural exports. If crop production is impacted by shocks that affect both the quantity and quality of output, such as pest epidemics, unfavourable weather, or changes in prices on the global market, both agricultural exports and the agricultural trade balance could be at risk (Al-Wasity et al., 2023). Even in the face of environmental legislation and factor endowments, strong institutions boost relative exports in clean industries (Shapiro, 2023).

H_1: Market environment moderates the relationship between government intervention (subsidy) and comparative advantage

MATERIALS AND METHODS

Using quantitative data gathering techniques, this study examines the moderating effects of market environment between mediating variable (government intervention (subsidy)) and Comparative Advantage of coconut farming in Malaysia. To gather quantitative data, a standardised questionnaire was created. The intended respondents, coconut farmers, were taken into consideration when creating the questionnaire. Getting the opinions of three research professionals on the study's topic area was the first step in creating the questionnaire's questions. The pertinent questions were subsequently revised after taking these remarks into account. Pre-testing of the study tools allowed for the identification and modification of items that respondents frequently misunderstood, ignored, or responded to incorrectly.

The Department of Agriculture Malaysia supplied a list of 160 coconut growers, from which information pertaining to coconut production was gathered. The G Power software developed by Edgar Erdfelder, Franz Faul, and Axel Buchner was used to calculate the study's sample size. In this case, 113 people make up the sample size for the 160-person population. For this reason, the researcher decided that 113 would be the ideal sample size for this investigation. However, as recommended by (Safara & Keshavarz, 2015), the study increased the sample size by 15% to account for incomplete questionnaires and sampling error.

To account for potential non-cooperative subjects and lost questionnaires, the researcher incorporated an extra 17 questioners (Bartlett, 2001), resulting in a total distribution of 130 questionnaires (113 + 17) for data collection. Nevertheless, a total of 123 questionnaires were recovered, yielding a 94.61% response rate—common in this kind of research. The survey's participants are the coconut farmers in Malaysia's coconut-growing states. The partial least squares structural equation modeling (PLS-SEM) technique, which creates composite reliability to emphasize the indication with greater reliability levels, was used in this work to examine the variables' reliability (Becker et al., 2012). For the variables in PLS-SEM to be considered significant, their outer loading must be greater than 0.60. Unless experts believe they can be kept, any variables with values less than 0.60 will be seen strong candidates for elimination (Fornell & Larcker 1981; Hair et al., 2012).

RESULTS AND DISCUSSION

The Results of the Structural Model Analysis

Hypotheses Testing Results

Normalcy of the data is not required because partial least squares is a non-parametric technique. Consequently, there is a chance that the T-values will either rise or fall, leading to a type 1 error. The bootstrapping approach is therefore recommended (Wong, 2013). To calculate bootstrapping standard errors, 5,000 subsamples are extracted from the original sample using replacement. T-value approximations for the structural path's significance test are generated by this process (Wong, 2013). The literature also recommends a variety of bootstrapping values, including 1000. The findings of the structural model employed in this study are shown in Figure 2.
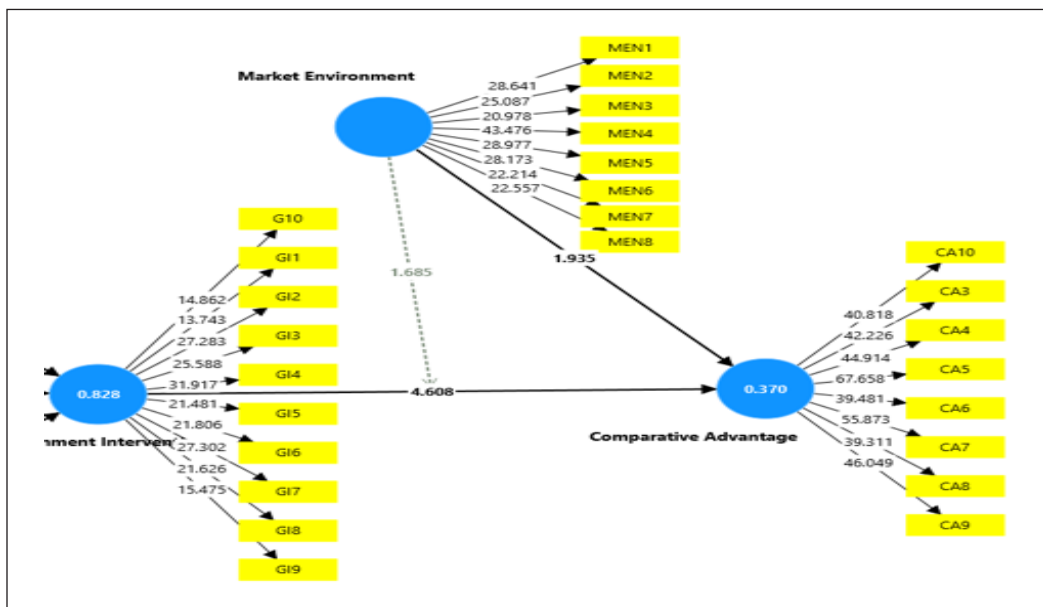

Figure 2. Results of structural model

The Moderation Analysis

In the current study, market environment was the moderator variable. H1 states that the market environment moderates the relationship between government intervention (subsidy) and Comparative Advantage. To test moderation, researcher has used the orthogonalisation approach as suggested by Becker et al. (2012), Results of the moderating test were discussed in Table 1.

H1: Market Environment Moderates the Relationship between Mediating Variable (Government Intervention) and Dependent Variable (Comparative Advantage)

Table 1
Indirect effect for moderator

Hypothesis	Relationship	Indirect Effect (β)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
H1	ME x GI -> CA	-0.09	-0.083	0.053	1.685	0.093

Note. P values - *, **, *** represent significance at 1%, 5%, 10 % respectively

Researchers hypothesised that the market environment moderates the relationship between comparative advantage and government intervention (Table 2). Findings revealed that the moderation effect of the market environment between government intervention and comparative advantage was significant at 10% (β -0.09, t-value = 1.685, p-value = -0.093).

The p-value of 0.093 indicates that while the result is not statistically significant at the conventional 5% level (p < 0.05), it is close to significance at the 10% level. The findings imply that there is a statistically significant moderating influence of the market environment on the association between comparative advantage and government intervention, but this effect is only moderately strong (significant at the 10% level). The t-value indicates how many standard deviations the coefficient is from zero. The prevailing market environment moderates the effectiveness of government intervention, which can play a critical role in enhancing comparative advantage.

The t-value (1.685) indicates how far the beta coefficient is from 0 in terms of standard errors. Generally, a t-value above 1.65 at a 10% significance level suggests a trend worth considering, although it's weaker compared to higher significance levels. The findings suggest that when the market environment becomes more prominent, the positive effects of government intervention on comparative advantage weaken. The statistically significant at the 10% level indicates that the effect is not very strong, but it's still meaningful enough to warrant attention.

Table 2
Hypothesis summary (moderator relationship test)

	Hypothesis	Result
H1	Market environment moderates the relationship between government intervention (subsidy) and comparative advantage	Supported

CONCLUSION

The results indicate that the moderating effect of the market environment on the relationship between government intervention and comparative advantage is significant at 10%. The findings imply that there is a statistically significant moderating influence of the

market environment on the association between comparative advantage and government intervention, but this effect is only moderately strong (significant at the 10% level).

This study also revealed that the moderating effect of the market environment on government intervention and comparative advantage was significant at 10%. These findings offer practitioners actionable frameworks for improving competitiveness, emphasising the importance of both internal decision-making and external environmental factors.

ACKNOWLEDGEMENT

REFERENCES

Al-Khazraji, Z. S., & Ahmed, A. F. (2023). Comparative advantage and the impact of government intervention policy in dairy production in Iraq. *IOP Conference Series: Earth and Environmental Science*, *1252*(1), Article 012179. https://doi.org/10.1088/1755-1315/1252/1/012179

Al-Wasity, R. T., Ahmed, A. F., & Albadawi, S. A. (2023). An economic analysis of the competitiveness of dates and their role in international agricultural marketing in Iraq for the period 2005-2019. *Iraqi Journal of Agricultural Sciences*, *54*(1), 205-215. https://doi.org/10.36103/ijas.v54i1.1691

Bartlett, M. S. (2001). *Face image analysis by unsupervised learning*. Springer.

Becker, J. M., Klein, K., & Wetzels, M. (2012). Hierarchical latent variable models in PLS-SEM: Guidelines for using reflective-formative type models. *Long Range Planning*, *45*(5-6), 359-394. https://doi.org/10.1016/j.lrp.2012.10.001

Che-Ngoc, H., Do-Thi, N., & Nguyen-Trang, T. (2023). Profitability of Ichimoku-based trading rule in Vietnam stock market in the context of the COVID-19 outbreak. *Computational Economics, 62*(4), 1781-1799. https://doi.org/10.1007/s10614-022-10319-6

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39-50. https://doi.org/10.1177/002224378101800104

Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The use of partial least squares structural equation modeling in strategic management research: A review of past practices and recommendations for future applications. *Long range planning*, *45*(5-6), 320-340. https://doi.org/10.1016/j.lrp.2012.09.008

Lee, K. Y. M. (2020). Technical analysis and Malaysian banking sector during Covid-19 pandemic. *UNIMAS Review of Accounting and Finance*, *4*(1), 41-46. https://doi.org/10.33736/uraf.2822.2020

Mizik, T. (2021). Agri-food trade competitiveness: A review of the literature. *Sustainability*, *13*(20), Article 11235. https://doi.org/10.3390/su132011235

Nandini, G., & Samal, R. (2020). Technical analysis of selected industry leaders of indian stock market under the cloud of COVID-19. *Gedrag & Organisate Review*, *33*(3), 837-854.

Nayar, N. M. (2016, December 10-12). *Does the coconut have a future? Keynote address*. [Paper presentation]. International Symposium on Coconut Research and Development, Kasaragod, India.

Safara, M., & Keshavarz, S. (2015). The moderating effect of occupation on the relationship between anger and mental health among extroverted and introverted women. *Open Journal of Medical Psychology*, *4*(4), 111-115. http://dx.doi.org/10.4236/ojmp.2015.44011

Shapiro, A. H. (2023, May 30). *How much do labor costs drive inflation?* (FRBSF Economic Letter No. 2023-13). Federal Reserve Bank of San Francisco. https://www.frbsf.org/research-and-insights/publications/economic-letter/2023/05/how-much-do-labor-costs-drive-inflation/.

Statista. (2020). *Number of internet users in India from 2010 to 2023, with estimates until 2050.* Statista. https://www.statista.com/statistics/255146/ number-of-internet-users-in-india/

Wong, K. K. K. (2013). Partial least squares structural equation modeling (PLS-SEM) techniques using SmartPLS. *Marketing Bulletin*, *24*(1), 1-32.