



Analysis of Revealed Comparative Advantage and Constant Market Share in Indonesian Horticultural Products

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ARTICLE INFO	ABSTRACT
<p>Edited by: Ika Swasti Putri</p> <p>Reviewed by: Arief Himmawan</p> <p>Correspondence: Febri Rakhmawati</p> <p>Keywords: Revealed Comparative Advantage, Continuous Market Share; Horticultural</p>	<p>This study undertakes a comparative analysis, focusing on Revealed Comparative Advantage (RCA) and Continuous Market Share (CMS) in the Indonesian flower seeds sector. Primary data sourced from the Bureau of Statistics (BPS) and Trademap, alongside secondary data from official websites of Indonesia's Ministry of Commerce and Ministry of Agriculture, are utilized. The study examines five fruit varieties (pineapple, banana, mango, orange, and mangosteen) and their trade relations with four key partner countries (Netherlands, Singapore, Malaysia, and the United States). The analysis reveals pineapple as a promising commodity for Indonesia to compete globally. Recognizing this potential, concerted efforts are being made by the Indonesian government, particularly the Ministry of Commerce, Ministry of Agriculture, and Ministry of Economic Cooperation, to foster a coordinated approach. The aim is to tap into international markets, notably the United States, through strategic policies supporting the development of Indonesian horticultural businesses, enhancing their global competitiveness.</p>

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1. Introduction

Horticulture plays a crucial role in the advancement of the agricultural industry. Horticultural commodities not only serve as a source of food, but also make valuable contributions to health, aesthetics, and the environment (Cruz-Piedrahita et al., 2020). Beginning in early 2020, the Covid-19 epidemic also raised the public's consciousness of the significance of eating horticulture products, particularly fruits, to be resilient (Kahramanoğlu et al., 2022). Horticulture continues to play a significant role in promoting national economic growth by supporting the well-being of farmers, stimulating regional and national economies, and boosting foreign exchange earnings through exports (Prabhu Pingali, 2016).

Export-Oriented Horticulture Development is one of the priority programs coordinated by the Coordinating Ministry for Economic Affairs with the aim of increasing production, quality, and continuity of horticultural products (Chaaban et al., 2018).

Prihasto said the export achievement of horticultural products reached 716 million dollars in

2021. That figure, according to him, increased by 10.9 percent compared to 2020. Increasing exports of fresh horticultural commodities is one of the targets that will be encouraged. During 2017-2019 the export value of fresh horticultural commodities showed an increasing trend, from 128.4 million USD in 2017 to 163 million USD in 2018 while until August 2019 the export value reached 119.4 million USD. In line with this, Indonesia is currently making vigorous efforts to expand its agricultural product market (including the tropical fruit market) to one of the giant importing blocs, the European Union (Fernandez et al., 2020; Hartono et al., 2020).

The government encourages the archipelago's native fruits to become a major player in the domestic fruit market as well as to increase exports, in order to increase farmers' income," said the Coordinating Minister for Economic Affairs (Maryati et al., 2020). Fruit commodities in the international market are very promising, this is an opportunity for Indonesia as a producer of tropical fruits (Sulistiyowarni et al., 2020).



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Fruit commodities have the largest contribution to horticultural GDP over the past five years with an average contribution of 54.7%, while the smallest contribution is occupied by medicinal plants with an average contribution of 4.26% (Heragu, 2019). The second and third positions are occupied by vegetables and ornamental plants, which have an average contribution of 34.33% and 6.75%, respectively. In terms of fruit production, from 2000 to 2020, Indonesia's average fruit production growth per year increased by an average of 6.06% (Dissanayake et al., 2020; Mukhametzhanov, 2022). In 2020, horticultural exports amounted to USD 645.48 million, an increase of 37.75% compared to 2019. This increase in exports was dominated by fruit commodities, where during the Covid-19 pandemic in 2020, the value of fruit export realization was recorded at USD 389.9 million, an increase of 30.31% compared to 2019 with five main destination countries namely China, Hong Kong, Malaysia, Saudi Arabia, and Pakistan.

This condition shows that Indonesian fruit actually has the ability to compete in the global market and is the largest supplier in ASEAN, especially tropical fruit horticultural products because not all countries have diverse tropical fruits (Yang et al., 2021). This opportunity should be encouraged to increase the value of exports supported by appropriate marketing strategies (Filipe Lages & Montgomery, 2004; Morgan et al., 2012). Optimization of international economic cooperation can be seen from the results of the Revealed Comparative Advantage (RCA) and Constant Market Share (CMS) analysis (Aklmawati, 2016). Revealed Comparative Advantage (RCA) and Constant Market Share (CMS) can show the advantages and disadvantages received by member countries and non-member countries in an international economic cooperation agreement (Abdul Kamal et al., 2021). Based on this phenomenon, the author intends to research and reveal the Revealed Comparative Advantage (RCA) and Constant Market Share (CMS) for Indonesian horticultural fruits (Qtaishat et al., 2022).

2. Critical Review

RCA is an international economic index that shows the competitiveness of a country relative to other countries in each commodity traded on the international market. RCA provides a basic assessment of a country's comparative advantage and

can be monitored from year to year whether or not the composition of the country's exports to partner countries shows good competitiveness relative to other countries or over time.

The Ministry of Agriculture through the Planning Bureau has compiled the Calculation Book of Import Duty Tariffs on Agricultural Commodities by formulating the RCA and CMS formulas (Ndwiga, 2015).

Constant Market Share (CMS) is a ratio that has the same purpose as RCA, which is to provide a perspective on the trade performance of a particular country's commodities (Fayaz & Ahmed, 2020). However, furthermore, the CMS formula can dissect the RCA value from several perspectives, namely Competitiveness Effect, Country Effect, Product Effect, and Adaption.

3. Method Innovation

This research is a descriptive quantitative research. Data sources come from primary data in the form of information obtained using interview guidelines, accompanied by the development of questions according to research needs. While secondary data is in the form of data from official sources such as the Ministry of Agriculture, Ministry of Trade, coordinating ministry for the economy and BPS.

The object of this research is the diversity of Indonesia's superior horticultural fruits that can compete abroad such as pineapple, banana, mango, orange and mangosteen.

The horticultural fruit export destination countries are in 3 friends, namely in Southeast Asia represented by Malaysia and Singapore, the European Continent represented by the Netherlands and the Arab Region represented by the United Arab Emirates (Boulding, 2024).

4. Innovation Result Discussion

The RCA analysis reveals varying degrees of competitiveness for Indonesian fruit exports across different partner countries. In the Netherlands market, only pineapple exhibits an RCA value exceeding 1 over the years, indicating its strong competitiveness compared to other fruits like bananas, mangoes, oranges, and mangosteens, which all have RCA values below 1. Similarly, in the Singaporean market, pineapple and mangosteen are the only fruits with RCA values surpassing 1, signaling their competitiveness. Conversely, bananas, mangoes, and oranges fall short in competitiveness, with RCA values below 1. In Malaysia, once again, pineapple



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and mangosteen emerge as the fruits with RCA values greater than 1, suggesting their competitive edge. Conversely, bananas, mangoes, and oranges demonstrate lower competitiveness, with RCA values below 1. Finally, in the United Arab Emirates (UAE) market, only pineapple showcases an RCA value above 1, indicating its strong competitiveness. Conversely, bananas, mangoes, oranges, and mangosteens display RCA values below 1, highlighting their comparatively weaker competitive positions. These findings align with previous estimations by Siregar, Tifani, and Muhammad (2010), which suggest that Indonesian fruits generally hold a lower competitive position compared to key competitor countries, as evidenced by their RCA, EPD, and CMS estimations during the 2001-2008 period.

The Continuous Market Share (CMS) analysis is used to evaluate the trading performance of Indonesian horticultural commodities in partner nations' marketplaces, including the Netherlands, Singapore, the United Arab Emirates (UAE), and Malaysia. The processed data clearly shows that various commodities have a beneficial trade performance, as shown by CMS values ranging from 0 to 1 in each partner country. Pineapples exhibit favorable fluctuations in competitiveness across different time periods in the marketplaces of the Netherlands, Singapore, UAE, and Malaysia, albeit with distinct differences. It is crucial to closely observe market trends in order to customize marketing strategies and improve the competitiveness of Indonesian horticulture products in global markets.

Indonesia can decide more favorable situations by

6. Table Research

Table 1. *Tropical Fruit Export Growth*

Jenis Buah	2018	2019	2020	2021
Pineapple	40%	55%	-70%	32%
Banana	65%	-22%	-50%	8%
Mango	1%	66%	-33%	-35%
Orange	-85%	78	-34%	-53%
Mangosteen	725%	27%	90%	-12%

Table 2. *RCA Analysis*

Netherland					
Fruit Type	2017	2018	2019	2020	2021
Pineapple	16,7997415	16,59272432	15,9181433	17,9932207	19,70371183
Banana	0,00001932	0,000011866	0,00000000	0,04660277	0,132723427

finding items that have comparative benefits in export destination countries. Furthermore, commodities with a Revealed Comparative Advantage (RCA) value less than 1 demonstrate below-average performance and can be utilized as a strategic approach by the government to investigate new markets that coincide with RCA and CMS studies (Liguori et al., 2020). This can ultimately enhance the export value in trade. This supports the findings of Gusti and Surya's (2015) research, which shows how competitive Indonesian exports of cocoa beans are in the ASEAN region (Advancement et al., 2006). Comparable studies by Desi and Army (2017) emphasize the competitive edge and relative advantages of Indonesian coffee; Ganjar et al. (2023) on the other hand, name three tropical fruits as Indonesia's main exports: orange, mango, and the mangosteen plant.

5. Conclusion

Based on the results of the analysis using Revealed Comparative Advantage (RCA) and Constant Market Share (CMS) on 5 samples of horticultural fruit in 4 trading partner countries of Indonesia, it is known that pineapple is the fruit that has the highest value. This makes pineapple a potential superior fruit owned by Indonesia to compete abroad. The Indonesian government, especially the ministry of trade, the ministry of agriculture and the coordinating ministry for the economy, coordinate to penetrate the market, especially the American continent, which has not been a market share for Indonesian horticultural fruit and make policies that can support Indonesian horticultural businesses to develop and have global competitiveness.

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Mango	0,00174951	0,001404836	0,00241838	0,00423165	0,000344404
Orange	0,00197593	0,006412842	0,00398957	0,00767391	0,007215073
Mangosteen	0,12260142	0,173533560	14122225	0,08332431	0,081935155

Singapore					
Type of Fruit	2017	2018	2019	2020	2021
Pineapple	48,64499911	36,68049068	32,74362811	39,99882855	41,82576066
Banana	0,521304620	1,085643540	0,477836324	0,363552185	0,797658585
Mango	0,846376897	1,065974546	1,753151380	0,953740962	0,754782054
Orange	0,002722327	0,000455973	0,000896354	0,001238290	0,001035167
Mangosteen	2,107074185	10,192475682	8,314741534	4,579375796	1,605006429

Malaysia					
Type of Fruit	2017	2018	2019	2020	2021
Pineapple	67,201822521	46,580750098	111,318594440	137,601557436	226,327046177
Banana	17,751163627	9,186735776	13,976320860	4,208735989	21,374763065
Mango	0,482010093	0,455596979	1,009818428	0,253499094	0,345969216
Orange	0,025250563	0,000374433	0,018663992	0,010706323	0,002259210
Mangosteen	7,839506571	12,344915226	3,484823658	9,237312987	2,022923641

United Arab Emirates					
Type of Fruit	2017	2018	2019	2020	2021
Pineapple	20,637823532	13,657380880	18,726962257	23,303937017	21,743688265
Banana	0,568486047	1,222871124	0,412985781	0,165272002	0,037143159
Mango	0,662710895	0,232794962	0,288521210	0,410189931	0,104671094
Orange	0,000090270	0,000006637	0,000000326	0,045335563	0,000003760
Mangosteen	0,730343321	14,186539234	8,222748377	1,361644096	1,512824216

Data Source; Processed by the Author

Table 3. CMS Analysis

Netherlands					
Pineapple	2017-2018	2018-2019	2019-2020	2020-2021	
Competitiveness	0,001208668934	0,006144232604	-0,005691637332	0,000008512017	
Initial Product	0,000768523509	-0,000340327119	-0,002746915289	0,000510517390	
Adaptation	0,000317148675	-0,000400337040	0,001471229401	0,000001187477	
Country Effect	0,000037238593	-0,000024918915	-0,000146682374	0,000021906916	
Product Effect	0,000731284916	-0,000315408203	-0,002600232915	0,000488610474	
Banana	2017-2018	2018-2019	2019-2020	2020-2021	
Competitiveness	0,001219013276	-0,000856497810	-0,000873648214	-0,000104724710	
Initial Product	0,000062628117	0,000070073116	-0,000102653842	-0,000017532702	
Adaptation	0,000224958227	-0,000032512674	0,000087322650	0,000013299846	
Country Effect	0,000110166497	0,000057302127	-0,000248565076	-0,000106083918	
Product Effect	-0,000047538381	0,000012770989	0,000145911234	0,000145911234	
Mango	2017-2018	2018-2019	2019-2020	2020-2021	
Competitiveness	-0,000060230585	0,000175753313	-0,000174732337	-0,000142377170	
Initial Product	0,000001548322	0,000007493211	-0,000002536488	0,000020658963	
Adaptation	-0,000000387278	0,000007246772	0,000001190700	-0,000014995848	
Country Effect	0,000002336346	0,000032188028	-0,000008791340	0,000050364383	



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Netherlands				
Product Effect	-0,000000788024	-0,000024694817	0,000006254852	-0,000029705420

Orange

	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	-0,000000175720	-0,000000032609	0,000141302127	-0,000128020665
Initial Product	0,000000016878	-0,000000000439	-0,000000000256	-0,000000750383
Adaptation	-0,000000014229	0,000000000405	-0,000013272520	0,000000750317
Country Effect	0,000186973802	-0,000066164228	-0,000784487861	-0,000016551763
Product Effect	-0,000186956923	0,000066163789	0,000784487605	0,000015801379

Mangosteen

	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	0,010738515185	-0,000064580396	-0,000715833430	0,000126003864
Initial Product	-0,000245917725	0,000022598989	0,009772955593	0,000068578364
Adaptation	-0,009951195973	-0,000001808993	-0,009168994373	0,000013271332
Country Effect	-0,000336715238	0,000001592988	0,001188526651	0,000050364383
Product Effect	0,000090797513	0,000021006001	0,008584428942	0,000018213982

Data Source; Processed by the Author

Singapore

Pineapple

	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	-0,010198523049	0,000063328953	0,009693261245	0,001061179383
Initial Product	0,003701638369	0,001806793789	-0,001555761711	-0,001197771107
Adaptation	-0,001678894953	0,000007995978	-0,000931573014	-0,000054332227
Country Effect	0,000076094942	0,000049257623	-0,000047513419	-0,000029945155
Product Effect	0,003625543427	0,001757536166	-0,001508248293	-0,001167825952

Banana

	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	0,000531630444	-0,000798589911	-0,000003699298	0,001095579010
Initial Product	0,000004264827	0,000183027905	0,000047744995	-0,000127528305
Adaptation	0,000002171632	-0,000092384693	-0,000000202044	-0,000152193701
Country Effect	0,000008181066	0,000168589319	0,000099919141	-0,000350784041
Product Effect	-0,000003916238	0,000014438586	-0,000052174146	-0,000052174146

Mango

	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	-0,000098995691	0,001047779558	-0,000678097844	-0,000361560272
Initial Product	0,000215610625	0,000040448485	0,000076959906	-0,000000923404
Adaptation	-0,000018820608	0,000034403085	-0,000022164238	0,000000192849
Country Effect	0,000254745404	0,000037945076	0,000043898038	-0,000000968191
Product Effect	-0,000039134779	0,000002503409	0,000033061868	0,000000044788

Orange

	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	-0,000050206047	0,000008248629	0,000011954506	-0,000004375137
Initial Product	-0,000001067559	-0,000000117977	-0,000000064869	0,000000446368
Adaptation	0,000000937978	-0,000000142977	-0,000000052418	-0,000000073332



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Singapore				
Country Effect	-0,000392149519	-0,000258736367	-0,000072369329	0,000360471003
Product Effect	0,000391081960	0,000258618390	0,000072304460	-0,000360024635
Mangosteen				
	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	0,000352986211	-0,000072765116	-0,000234809277	-0,000300653840
Initial Product	0,000111944864	0,000030010211	-0,000199008611	0,000097203587
Adaptation	0,000280477638	-0,000002463853	0,000055558767	-0,000063145320
Country Effect	0,000053128108	0,000002944349	-0,000023934431	0,000021226384
Product Effect	0,000058816757	0,000027065861	-0,000175074180	0,000075977204
Data Source; Processed by the Author				
Malaysia				
Pineapple				
	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	-0,000016004615	0,001074235081	0,005623334737	-0,001847225132
Initial Product	0,000278651081	0,000042708213	-0,000830295216	-0,001870943264
Adaptation	-0,000003095064	0,000026980150	-0,001641490472	0,000576399678
Country Effect	0,000004146481	0,000000916864	-0,000007458729	-0,000013596817
Product Effect	0,000274504600	0,000041791349	-0,000822836487	-0,001857346447
Banana				
	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	-0,000985103788	0,000097856749	-0,001225494872	0,003870245272
Initial Product	-0,000346328873	0,001769708915	0,000235541962	-0,001061683735
Adaptation	0,000090619388	0,000068611061	-0,000064717622	-0,001206549676
Country Effect	-0,000019510207	0,000192637402	0,000016852930	-0,000252257147
Product Effect	-0,000326818666	0,001577071512	0,000218689032	0,000218689032
Mango				
	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	0,000080520576	0,000167828317	-0,000151357259	-0,000141701619
Initial Product	0,000011367639	-0,000073975523	0,000167564572	0,000023277205
Adaptation	0,000003961534	-0,000037978095	-0,000066257920	-0,000009913255
Country Effect	0,000023583820	-0,000162370531	0,000165935348	0,000091823622
Product Effect	-0,000012216181	0,000088395008	0,000001629224	-0,000068546417
Orange				
	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	-0,000202916400	0,000144314847	0,000057364142	-0,000181262132
Initial Product	-0,000000803067	0,000000049121	-0,000006369365	0,000000880132
Adaptation	0,000000786077	0,000001622672	-0,000002430066	-0,000000802004
Country Effect	-0,000031803914	0,000131186796	-0,000341264897	0,000082206721
Product Effect	0,000031000848	-0,000131137675	0,000334895531	-0,000081326589
Mangosteen				
	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	0,004684559594	-0,007150539332	0,007111870506	-0,011007399469
Initial Product	0,000184885513	-0,002004450440	0,000578255425	0,000848203537
Adaptation	0,000230475764	0,001618105127	0,003113281450	-0,000770062915



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Country Effect	0,000023583820	-0,000162370531	0,000165935348	0,000091823622
Product Effect	0,000161301693	-0,001842079909	0,000412320078	0,000756379915

Data Source; Processed by the Author

United Arab Emirates

Pineapple

	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	0,001208668934	0,006144232604	-0,005691637332	0,000008512017
Initial Product	0,000768523509	-0,000340327119	-0,002746915289	0,000510517390
Adaptation	0,000317148675	-0,000400337040	0,001471229401	0,000001187477
Country Effect	0,000037238593	-0,000024918915	-0,000146682374	0,000021906916
Product Effect	0,000731284916	-0,000315408203	-0,002600232915	0,000488610474

Banana

	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	0,001219013276	-0,000856497810	-0,000873648214	-0,000104724710
Initial Product	0,000062628117	0,000070073116	-0,000102653842	-0,000017532702
Adaptation	0,000224958227	-0,000032512674	0,000087322650	0,000013299846
Country Effect	0,000110166497	0,000057302127	-0,000248565076	-0,000106083918
Product Effect	-0,000047538381	0,000012770989	0,000145911234	0,000145911234

Mango

	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	-0,000060230585	0,000175753313	-0,000174732337	-0,000142377170
Initial Product	0,000001548322	0,000007493211	-0,000002536488	0,000020658963
Adaptation	-0,000000387278	0,000007246772	0,000001190700	-0,000014995848
Country Effect	0,000002336346	0,000032188028	-0,000008791340	0,000050364383
Product Effect	-0,000000788024	-0,000024694817	0,000006254852	-0,000029705420

Orange

	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	-0,000000175720	-0,000000032609	0,000141302127	-0,000128020665
Initial Product	0,000000016878	-0,000000000439	-0,000000000256	-0,000000750383
Adaptation	-0,000000014229	0,000000000405	-0,000013272520	0,000000750317
Country Effect	0,000186973802	-0,000066164228	-0,000784487861	-0,000016551763
Product Effect	-0,000186956923	0,000066163789	0,000784487605	0,000015801379

Mangosteen

	2017-2018	2018-2019	2019-2020	2020-2021
Competitiveness	0,010738515185	-0,000064580396	-0,000715833430	0,000126003864
Initial Product	-0,000245917725	0,000022598989	0,009772955593	0,000068578364
Adaptation	-0,009951195973	-0,000001808993	-0,009168994373	0,000013271332
Country Effect	-0,000336715238	0,000001592988	0,001188526651	0,000050364383
Product Effect	0,000090797513	0,000021006001	0,008584428942	0,000018213982

Data Source; Processed by the Author

Table 4. Indonesia's Horticultural Fruit Market Targets

Country	Belanda	Singapura	UEA	Malaysia
Fruit				
Pineapple	√	√	√	√



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Banana	√	√	√
Mango			√
Orange			
Mangosteen		√	
Data Source; Processed by the Author			

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