



## **Comparative Advantage Trends of Selected Hawai'i Agricultural Products in the U.S. Mainland Market**

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The recent remarkable growth of Hawai'i's diversified agriculture (including seed crops, fruits and nuts, vegetables, and floriculture and nursery products) has more than made up for the continuing declines in sugarcane and pineapple production. As a result, agriculture remains a vital and steady contributor to Hawai'i's economy by providing a diversity of products and generating jobs and incomes. In 2005, agriculture contributed to 2.7 percent of total Hawai'i sales, 1.7 percent of total value added or GDP, 3.4 percent of employment, and 2.0 percent of labor income, when distribution margins are included.<sup>1</sup>

In the era of diversified agriculture, it is imperative to understand the comparative advantage (CA) of the various agricultural products. This understanding will help to identify, for example, the agricultural products in which Hawai'i is relatively more competitive and which stand a better chance to thrive in the long run.

This publication is an extension and update of a previous CTAHR publication in assessing Hawai'i's CA of selected agricultural products in the U.S. mainland market.<sup>2</sup> While the previous publication focused on assessing the CA for the years 1993 and 2003, the current publication investigates the trends of CA over the decade from 1995 to 2005. In particular, we are interested in finding out whether the major Hawai'i agricultural products destined for the U.S. mainland market are gaining, losing, or maintaining their CA.

Using a more refined set of information compared to that used in the previous assessment, we found that between 1995 and 2005, coffee, seed corn, and dendrobium exhibited significant trends in gaining CA in the U.S. mainland

market, while fresh pineapples, processed pineapples, raw sugar, potted orchids, and foliages exhibited significant trends in losing their CA, and fresh papayas, macadamia nuts, and anthurium tended to maintain their CA.

### **Method**

One common measure of CA is the "revealed comparative advantage" (RCA) index. Unfortunately, the traditional RCA index is static in nature and is not comparable over time. We have recently developed an index which has been shown to be valid for temporal comparison. This improved index which we will refer to as the "normalized revealed comparative advantage" (NRCA) index<sup>3</sup> is capable of systematically revealing changes in the CA of a particular product over time, something we were unable to do with the RCA index. As the sum of the NRCA

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The views expressed in this publication are those of the authors and do not necessarily reflect the position of the College of Tropical Agriculture and Human Resources, University of Hawai'i at Mānoa, or the Hawai'i Department of Agriculture.

<sup>1</sup> PingSun Leung and Matthew Loke, *The Contribution of Agriculture to Hawai'i's Economy: 2005*, University of Hawai'i at Mānoa, College of Tropical Agriculture and Human Resources (UH-CTAHR) Economic Issues EI-13, January 2008.

<sup>2</sup> Junning Cai, PingSun Leung, and Matthew Loke, *Comparative Advantage of Selected Agricultural Products in Hawai'i: A Revealed Comparative Advantage Assessment*, UH-CTAHR Economic Issues EI-11, April 2007.

<sup>3</sup> For the concept and discussion of the NRCA index, see Run Yu, Junning Cai, and PingSun Leung's paper "The Normalized Revealed Comparative Advantage Index"; *Annals of Regional Science*, in press.

scores for the products under investigation always equals zero, a positive NRCA score then indicates that the CA of a product is above the average level of the 11 selected agricultural products in this assessment, i.e., Hawai'i is relatively more competitive in this product; and a negative NRCA score indicates that the CA of a product is below the average level of 11 selected agricultural products in this assessment, i.e., Hawai'i is relatively less competitive in this product. The magnitude of the score indicates the extent of CA that is above (or below) the average level.

Based on the NRAC indices, we use a simple time trend model to detect whether a particular product has exhibited a statistically significant trend in gaining, losing, or maintaining its CA. We also use Cuddy and Della Valle's instability index<sup>4</sup> to measure the degree of fluctuation that a particular product has in its CA, especially when no significant CA trend is detected for this product.

Details about the NRCA index, the time trend model, and the instability index are presented in Appendix I.

## Data

The present assessment focuses on 11 selected agricultural products that Hawai'i sends in substantial shipments to the U.S. mainland market, as well as for which relevant data are available. It includes three fruit products (fresh papayas, fresh pineapples, and processed pineapples), one sugarcane product (raw sugar), two tree nuts (coffee and macadamia nuts), one seed crop (sweet corn), and four floriculture products (fresh cut anthurium, spray dendrobium, potted orchids, and foliage). Supply in the U.S. mainland market is composed of three sources: Hawai'i's shipment to the U.S. mainland, U.S. mainland supply (equals U.S. mainland production minus U.S. mainland export), and U.S. mainland import (U.S. total import minus Hawai'i's import).<sup>5</sup> Data on Hawai'i's shipments to the U.S. mainland are either obtained directly from various issues of the Statistics of Hawai'i Agriculture published by Hawai'i Department of Agriculture or derived from the annual statistics of Hawai'i's production and export.<sup>6</sup> Data on U.S. mainland production are from a variety of statistics published by the United States Department of Agriculture (USDA), including various issues of Fruit and Tree Nuts Situation and Outlook, Statistics of Vegetables and Melons, Sugar and Sweeteners Outlook, Floriculture and Nursery Crops Situation and Outlook, and Agricultural Statistics. Data on U.S. mainland and Hawai'i's exports and imports are from the State Trade

Statistics published by the World Trade Atlas (2007). Details on the trade statistics for this assessment are presented in Appendix II.

## Results

The annual U.S. mainland market for the 11 selected agricultural products in this assessment fluctuated around \$6.3 billion during the decade from 1995 to 2005. In 1995, the total value of the 11 products was approximately \$6.5 billion. It reached a record high of \$7.5 billion in 1997 and then declined gradually to a record low of \$5.2 billion in 2002. In 2005, the total market value bounced back to \$6.6 billion, slightly above its 1995 level. As illustrated in Figure 1, the trajectory of the market value and market share for the Hawai'i, U.S. mainland, and foreign growers indicates that foreign imports are the leading source of the fluctuations of U.S. mainland agriculture market over the period 1995–2005. Total supply of the 11 products from Hawai'i to the U.S. mainland and its market share are rather stable during the same period. From 1995 to 2005, Hawai'i's exports of these 11 products to the U.S. mainland declined only slightly in terms of total value (–\$2.6 million) and market share (–0.2%), suggesting that in 2005 the competitiveness that Hawai'i has in these 11 products as a whole with respect to its competitors is fairly similar to its level in 1995.

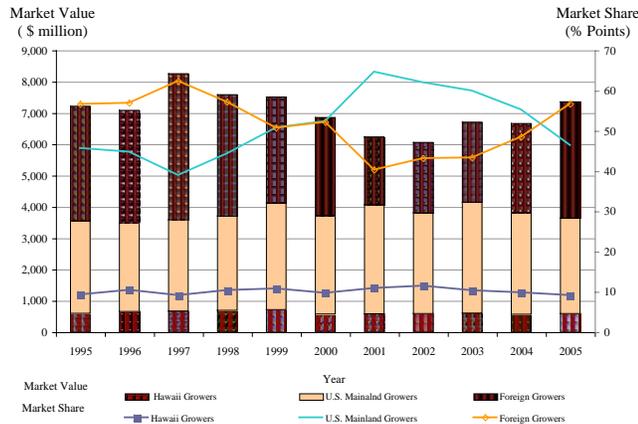
However, as evidenced by the changes in their NRCA scores, the CAs of the 11 selected Hawai'i agricultural products experienced substantial changes from 1995 to 2005. Compared to their 1995 levels, in 2005 Hawai'i gained CA in four products, including coffee, macadamia nuts, seed corn, and dendrobium, suggesting that these four products have become relatively more competitive among the 11 selected products. Meanwhile, Hawai'i lost CA in seven products, including fresh papayas, fresh pineapples, processed pineapples, raw sugar, anthurium, potted orchids and foliage, suggesting that these seven products have become relatively less competitive among the 11 products.

<sup>4</sup> Cuddy J.D., and P.A. Della Valle. 1978. Measuring the Instability of Time Series Data. *Oxford Bulletin of Economics and Statistics* 40: 79–85.

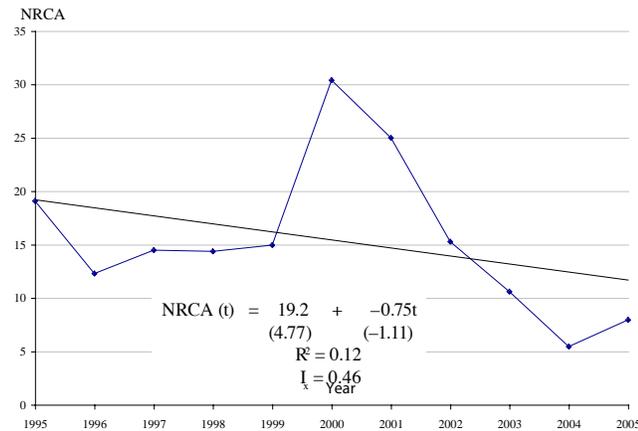
<sup>5</sup> Possible transshipments of foreign imports from U.S. mainland to Hawai'i are not considered in this assessment.

<sup>6</sup> Hawai'i's shipment to the U.S. mainland equals estimated Hawai'i total outshipment minus Hawai'i's exports to the foreign countries. See Appendix II for more information.

**Figure 1. Supply and market share of the 11 selected agricultural products in the U.S. mainland market.**



**Figure 2. CA trend of fresh papayas, 1995–2005.\***

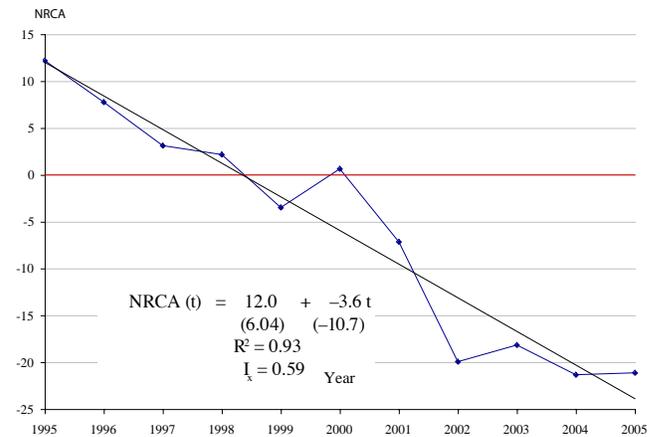


\*Note: In Figures 2 to 12, the numbers in parentheses underneath the estimates are the corresponding t-statistics.

**Papayas (fresh)**

Although its CA declined between 1995 and 2005, fresh papayas did not exhibit a significant trend in losing CA during the decade (Figure 2). The instability index, on the other hand, indicates that its CA fluctuated greatly during the period. Nevertheless, the CA of fresh papayas remained above the average level of the 11 selected agricultural products throughout the period. Hence, the CA of fresh papayas is expected to continue to fluctuate but maintain its position above the average level of the 11 agricultural products in the near future.

**Figure 3. CA trend of fresh pineapples, 1995–2005.**



**Pineapples (fresh)**

Fresh pineapples exhibited a strong and significant trend in losing CA from 1995 to 2005 (Figure 3). As a result, the CA of fresh pineapples declined from above the average level of the 11 agricultural products to below the average level after 1999. Although the decreasing trend leveled off somewhat during 2002–2005, fresh pineapples is expected to continue to become relatively less competitive among the 11 agricultural products, and its CA will continue to stay below the average level in the near future.

**Pineapples (processed)**

Similar to fresh pineapples, processed pineapples also exhibited a strong and significant trend in losing CA from 1995 to 2005 (Figure 4). Despite the decline, the CA of processed pineapples remained above the average level of the 11 agricultural products, owing to its strong CA in 1995. Processed pineapples thus is expected to continue to become relatively less competitive among the 11 agricultural products, and the recent dive in its CA may be of concern to the industry. Its CA however, will probably remain above the average level in the near future.

**Raw sugar (cane)**

Raw sugar in general exhibited a strong and significant trend in losing CA from 1995 to 2005 (Figure 5). As a result, its CA dropped significantly below the average level of the 11 agricultural products after 1996. Although since 2001 raw sugar has started to regain its CA somewhat, it is expected that the CA of raw sugar will continue to stay

Figure 4. CA trend of processed pineapples, 1995-2005.

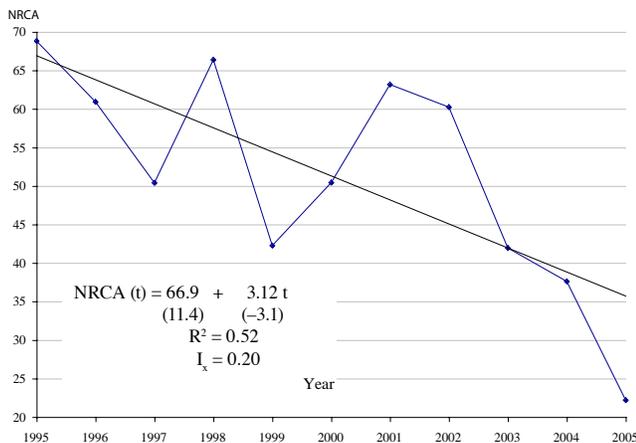
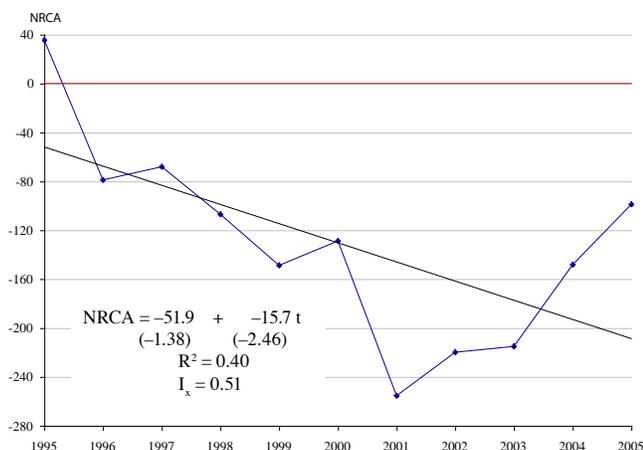


Figure 5. CA trend of raw sugar, 1995-2005.



significantly below the average level of the 11 agricultural products in the near future.

### Coffee

Coffee in general exhibited a strong and significant trend in gaining CA from 1995 to 2005 (Figure 6). Despite the rapid increase, the CA of coffee was significantly below the average level of the 11 agricultural products throughout the period. Hence, coffee is expected to become relatively more competitive among the 11 selected agricultural products, but its CA will most likely continue to stay significantly below the average level in the near future.

### Macadamia nuts

Although its CA has increased between 1995 and 2005, macadamia nuts does not exhibit a significant trend in

Figure 6. CA trend of coffee, 1995-2005.

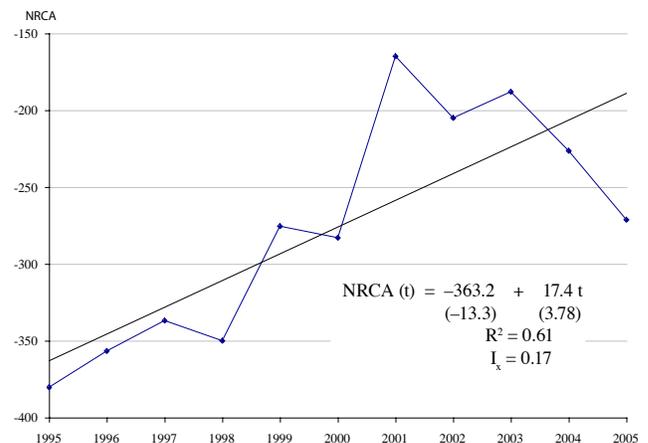
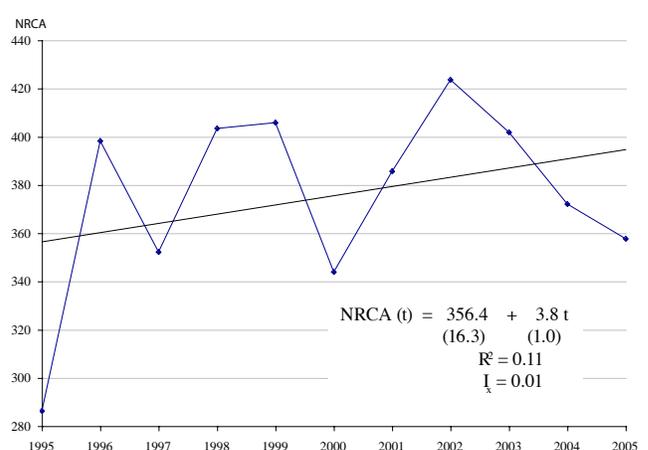


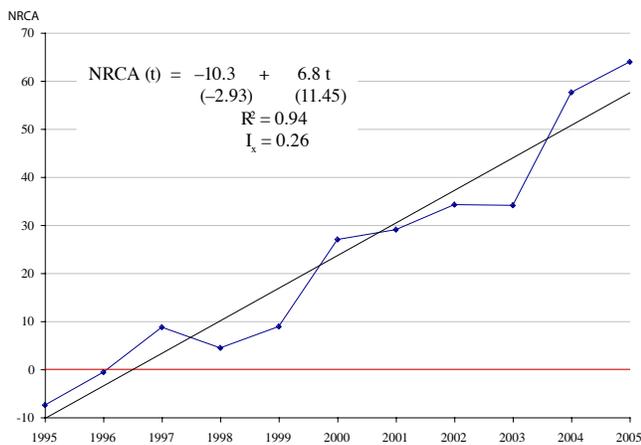
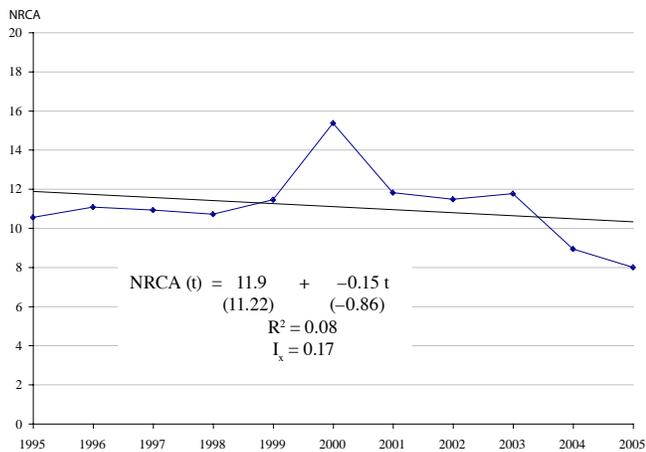
Figure 7. CA trend of macadamia nuts, 1995-2005.



gaining CA during the period (Figure 7). The instability index for macadamia nuts also indicates that the fluctuation in its CA is rather small. Hence, the CA of macadamia nuts is expected to remain stable and significantly above the average level of the 11 agricultural products in the near future.

### Seed corn

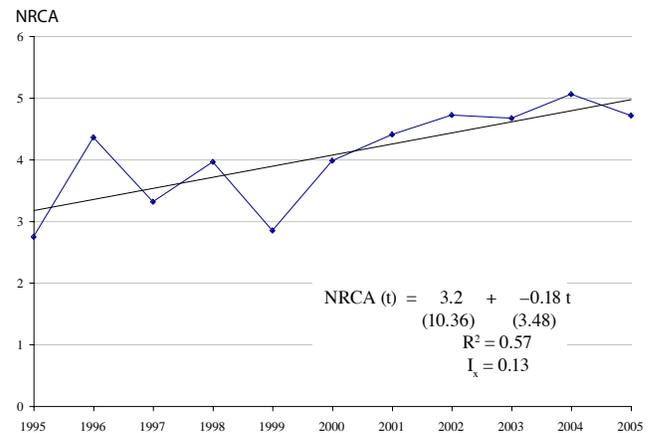
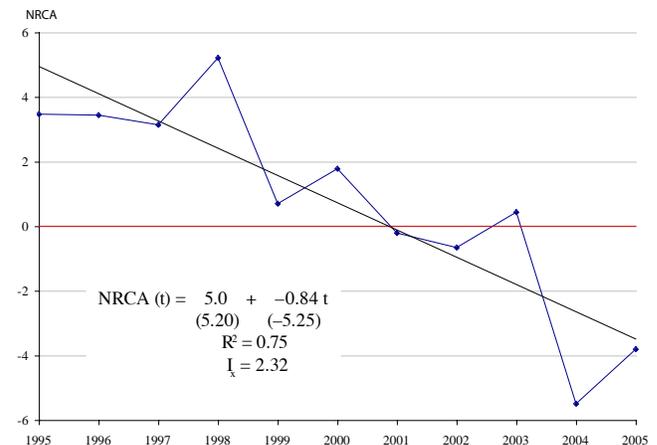
Seed corn exhibited a strong and significant trend in gaining CA from 1995 to 2005 (Figure 8). As a result, the CA of seed corn has increased from below the average level of the 11 agricultural products to significantly above the average level. According to its CA trend, in the near future seed corn is expected to continue to become relatively more competitive among the 11 agricultural products, and its CA will continue to stay significantly above the average level.

**Figure 8. CA trend of seed corn, 1995-2005.****Figure 9. CA trend of fresh cut anthurium, 1995-2005.*****Anthurium (fresh, cut)***

Although its CA declined slightly between 1995 and 2005, fresh cut anthurium did not exhibit a significant trend in losing CA from 1995 to 2005. The instability index also indicates that the fluctuations in the CA of anthurium are rather small. As a result, the CA of anthurium in 2005 had declined only slightly compared to its 1995 level. Anthurium therefore is expected to continue to maintain its CA position slightly above the average level of the 11 agricultural products in the near future.

***Dendrobium (spray)***

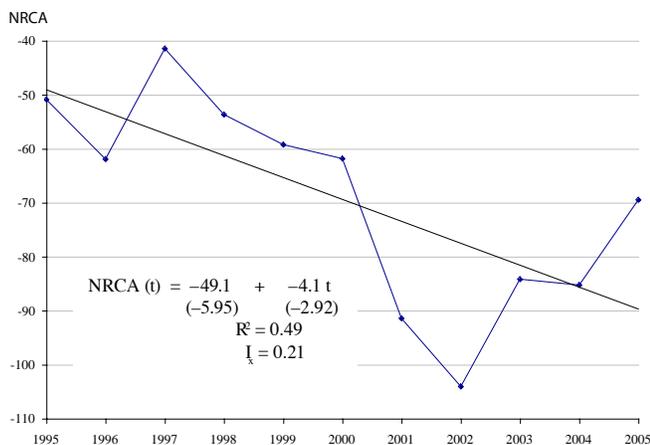
Spray dendrobium exhibited a small but significant trend in gaining CA from 1995 to 2005 (Figure 10). As the magnitude of the increasing trend and its initial CA is fairly small, no significant increase in CA is expected for

**Figure 10. CA trend of spray dendrobium, 1995-2005.****Figure 11. CA trend of potted orchids, 1995-2005.**

dendrobium in the near future, although it is expected to continue to become relatively more competitive among the 11 agricultural products. The CA of dendrobium will continue to stay slightly over the average level in the near future.

***Orchids (potted)***

Potted orchids exhibited a small but significant trend in losing CA from 1995 to 2005 (Figure 11). As a result, its CA dropped from above the average level of the 11 agricultural products to below the average level. According to this decreasing trend, in the near future potted orchids is expected to continue to become relatively less competitive among the 11 agricultural products, and its CA will continue to stay slightly below the average level.

**Figure 12. CA trend of foliages, 1995–2005.****Foliages (cut and potted)**

The CA of foliages remained significantly below the average level of the 11 agricultural products from 1995 to 2005. In addition, foliages exhibited a strong and significant trend in losing CA during the period (Figure 12). Although this decreasing trend leveled off somewhat after 2002, in the near future foliages is expected to become relatively less competitive among the 11 agricultural products and its CA will continue to stay considerably below the average level.

**Summary**

The competitiveness (measured by the market share) of 11 selected Hawai'i agricultural products as a whole changed only negligibly between 1995 and 2005 with respect to their counterparts in the U.S. mainland market, but the relative competitiveness (comparative advantage) of these products experienced substantial changes during the same period. According to the results of the CA trend analysis, during the decade from 1995 to 2005 five products, including fresh pineapples, processed pineapples, raw sugar, potted orchids and foliages, exhibited a significant trend to become relatively less competitive, while three products, including coffee, seed corn, and dendrobium, exhibited a significant trend to become relatively more competitive. Meanwhile, three products, including fresh papayas, macadamia nuts and anthurium tended to maintain their comparative advantage in this assessment.

Following the typology of the specialization competitiveness matrix proposed by the World Bank and

the Economic Commission for Latin America and The Caribbean,<sup>7</sup> if a product exhibits a significant trend in gaining share in the U.S. mainland agriculture market, it is a dynamic product, i.e., the market share for the product among the particular product set under investigation keeps growing. For example, the share of the U.S. mainland market for fresh papayas with respect to the total U.S. mainland market for the 11 agricultural products under our investigation grew at 0.1 percent per year during the decade from 1995 to 2005. Fresh papayas thus can be classified as a dynamic product between 1995 and 2005. Otherwise, if a product does not exhibit a significant trend in gaining market share in a particular product set, it is a stagnant product. For example, the U.S. mainland market for raw sugar does not exhibit a significant trend in gaining share in the total U.S. mainland market for the 11 agricultural products during the past decade from 1995 to 2005. Raw sugar then is a stagnant product during the period 1995 to 2005.

We use a simple time trend model similar to the one used for the CA trend analysis<sup>8</sup> to detect whether the market share of a particular product exhibited a significant increasing trend between 1995 and 2005. The results indicate that during the decade from 1995 to 2005 eight agricultural products, including fresh papayas, fresh pineapples, processed pineapples, macadamia nuts, seed corn, dendrobium, potted orchids, and foliages, can be considered as dynamic products (i.e., they exhibit a significant trend in gaining their market shares), and three agricultural products, including raw sugar, coffee and anthurium can be considered as stagnant products (they exhibit no significant trend in gaining their market shares). Combined with the information of their CA trends between 1995 and 2005, we could create the specialization competitiveness matrix for Hawai'i's 11 selected agricultural products as follows.

According to the specialization competitiveness matrix, seed corn and dendrobium can be considered the *rising stars* of Hawai'i's agricultural exports to the U.S. mainland market, suggesting great business oppor-

<sup>7</sup> Specialization is another name for revealed comparative advantage in the World Bank's study of competitiveness analysis of nations (CAN), "TradeCAN, Database and Software for A Competitiveness Analysis of Nations", Economic Commission for Latin America and The Caribbean and The World Bank, Washington DC, 1999.

<sup>8</sup> An increasing trend is considered present if it is statistically significant at the 10% significance level, i.e.,  $P$ -value  $< 0.1$ . See Equation 2 of Appendix I for more information.

**Figure 13. Hawai'i's specialization competitiveness matrix for 11 selected agricultural products.**

		Stagnant products	Dynamic products
Dynamic CA	Dynamic CA	<b>Declining stars</b> coffee	<b>Rising stars</b> seed corn, dendrobium
		Stagnant CA	<b>Retreats</b> raw sugar, anthurium

tunity for Hawai'i's producers, as both the CA and the corresponding U.S. mainland market for seed corn and dendrobium have been on the rise. Coffee, on the other hand, can be considered the *declining star* of Hawai'i's agricultural exports to the U.S. mainland market, suggesting a promising but risky business opportunity for Hawai'i's producers, since despite its increasing CA, the U.S. mainland market for coffee has been in decline. In

addition, during the decade 1995–2005, while Hawai'i's producers might have missed possible opportunities of increasing exports of fresh papayas, fresh pineapples, processed pineapples, macadamia nuts, potted orchids, and foliages to the U.S. mainland market, they have retreated from the U.S. mainland markets for raw sugar and anthurium.

These results concerning the CA trends of Hawai'i's agricultural exports to the U.S. mainland are generally consistent with the findings reported in the earlier publication, EI-11, mentioned previously. Namely, in the period from 1995 to 2005, Hawai'i lost significant CA in sugarcane and pineapple products but gained considerable CA in coffee. This assessment confirms that the golden age of sugarcane and pineapple plantations has passed. Technology-intensive products such as seed crops and specialty products such as Kona coffee and dendrobium stand a promising chance for growth and success.

### Acknowledgments

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## Appendix I. Methods

### *NRCA Index*

In the U.S. mainland market, Hawaii's agricultural products in general compete with their counterparts produced by both the U.S. mainland producers and the foreign producers. While the competitiveness that Hawaii has in a particular product as compared to its competitors can be gauged by Hawaii's market share in this particular product, the "relative competitiveness" that Hawaii has in this particular product with respect to other Hawaii products, i.e., the comparative advantage (CA), can not be measured by directly comparing their market shares<sup>‡1</sup>. One commonly measure of CA is the "revealed comparative advantage" (RCA) index. However, the traditional RCA index is static in nature and is not comparable over time. We have recently developed an index which has been shown to be valid for temporal comparison. We called this index the "normalized revealed comparative advantage" (NRCA) index. According to the NRCA index, Hawaii's CA in product j can be measured by the following formula:

$$(1) \quad NRCA_j^h = \frac{E_j}{E} \left( \frac{E_j^h}{E_j} - \frac{E^h}{E} \right),$$

where  $E_j^h$  denotes Hawaii's supply of product j in the U.S. mainland market;  $E_j$  denotes the total supply of product j in the U.S. mainland from Hawaii, U.S. mainland and foreign producers;  $E^h$  denotes Hawaii's total supply of agricultural products in the U.S. mainland market; and  $E$  denotes the total supply of agricultural products in the U.S. mainland from Hawaii, U.S. mainland and foreign producers. According to Equation (1), NRCA essentially weighs the difference between Hawaii's market share in product j ( $\frac{E_j^h}{E_j}$ ) and its average market share in the U.S. mainland agriculture market ( $\frac{E^h}{E}$ ) with product j's market share in the U.S. mainland agriculture market ( $\frac{E_j}{E}$ ).

The sum of Hawaii's NRCA scores for the set of agricultural products under investigation is equal to zero, i.e.,  $\sum_j NRCA_j^h = 0$  (where j is an index representing the various agricultural products under investigation). Hence, the sign of  $NRCA_j^h$  indicates whether Hawaii's CA in product j is above or below the average level. A positive  $NRCA_j^h$  indicates that Hawaii's CA in product j is above the average level, namely Hawaii is relatively more competitive in this product as compared to other products in the product set under investigation. A negative  $NRCA_j^h$  indicates that Hawaii's CA in product j is below the average level, namely Hawaii is relatively less competitive in this product as compared to other products in the product set under investigation. The magnitude of  $NRCA_j^h$  then signifies the extent of CA that is above (or below) the average level. As the sum of Hawaii's NRCA equals zero across products, the

<sup>‡1</sup>For detailed discussion of the concepts of competitiveness, comparative advantage, and revealed comparative advantage, see Junning Cai and PingSun Leung's paper "A Review of Comparative Advantage Assessment Approaches in Relation to Aquaculture Development"; Chapter 4 in *Species and System Selection for Sustainable Aquaculture*, P.S. Leung, C.S. Lee, and P. O'Bryen, editors, Blackwell Publishers, p. 43–56, 2007.

NRCA index also reveals the shift of CA among the various products. When Hawaii becomes *relatively* more competitive in some products, it has to become *relatively* less competitive in other products.

### **CA Trend Analysis**

The NRCA index is comparable over time and can be used to examine the evolution of Hawaii's CA in various agricultural products, i.e., whether Hawaii's CA in an individual product is stable or exhibits a tendency to increase or decrease. The CA trend can be examined by a simple time trend model as follows:

$$(2) \quad NRCA_{j,t}^h = \alpha_j + \beta_j t + \varepsilon_{j,t},$$

where  $\alpha_j$  is a constant;  $t$  is the index for year;  $\varepsilon_{j,t}$  is a residual term; and  $\beta_j$  is the coefficient of the time index  $t$ , which reveals the dynamics of Hawaii's CA. Hawaii's CA in product  $j$  can be said have a trend, if the estimated  $\beta_j$  is significantly different from zero. Specifically,  $\beta_j > 0$  indicates a trend in gaining CA, or a trend to become relatively more competitive.  $\beta_j < 0$ , on the other hand, indicates a trend in losing CA, or a trend to become relatively less competitive. The significance of the trend will be verified by t-test. if  $\beta_j$  is significant different from zero at the 10% significance level, i.e.,  $p\text{-value} \leq 0.1$ , there is a significant CA trend during the past decade from 1995 to 2005. Otherwise ( $p\text{-value} > 0.1$ ), there is no significant CA trend during the past decade.

### **Instability Index**

In case where there is no statistically significant trend ( $p\text{-value} > 0.1$ ), the CA of a particular product would still be dynamics, i.e., fluctuates somewhat but has no persistent tendency to decline or increase. To measure the degree of CA fluctuation when there is no significant CA trend, we use the instability index proposed by Cuddy and Della Valle (1978), which is expressed as follows:

$$(3) \quad I_x = \left| CV \sqrt{1 - \bar{R}^2} \right|,$$

where  $CV$  is the coefficient of variation of the CA series of an individual product and  $\bar{R}^2$  is the adjusted coefficient of determination associated with Equation (2).

## Appendix II. Data sources and assumptions

Product	Supplier	Trade Code*	Description
<b>Papayas , Fresh</b>	Import/Export	HS0807200000	Papayas (papaws) fresh.
	U.S. mainland		No production.
	Hawaii		Outshipment of fresh papayas is available. FAS value.
<b>Pineapples, Fresh</b>		HS0804304000	Pineapples, fresh or dried, not reduced in size, in crates or other packages.
	Import/Export	HS0804306000	Pineapples, fresh or dried, reduced in size.
		HS0804302000	Pineapples, fresh or dried, not reduced in size, in bulk.
	U.S. mainland		No production.
	Hawaii		Outshipment of fresh pineapples is available. FAS value.
<b>Pineapples, Processed</b>		HS200820	Pineapples, prepared or preserved, NESOI.
		HS200940	Pineapple juice, sweetened or not.
		HS200941	Pineapple juice of Brix value<20,Nt Fort, Unfermnt.
	Import/Export	HS200949	Pineapple juice, Nt Fort., Unfermnt, NESOI.
		HS0811905000	Pineapples, uncooked or cooked by steaming or boiling in water, frozen , whether or not sweetened.
		HS0812904000	Pineapples, provisionally preserved, but unsuitable in that state for immediate consumption.
	U.S. mainland		No production.
	Hawaii		Canned fruit, juice, and by-product. Local consumption is assumed small and negligible. FAS value.
<b>Raw Sugar, Cane</b>		HS1701111000	Cane sugar, raw, in solid form, not containing added flavoring or coloring matter, NESOI, described in additional U.S. note 5 (chapter. 17) & provisional.
	Import/Export	HS1701115000	Cane sugar raw solid form, no added flavoring or coloring matter, NESOI.
		HS1701110500	Cane sugar raw solid form , no added flavoring or coloring matter, NESOI, described in general U.S. note 15 of the schedule & provisional.
	U.S. mainland		Cane raw sugar. New York, duty-fee paid, price. Sugar and Sweeteners Outlook (USDA).
	Hawaii		Cane raw sugar. New York , duty-fee paid , price. Local consumption is assumed small and negligible.
<b>Macadamia Nuts</b>		HS0802909810	Macadamia nuts, fresh or dried, shelled.
	Import/Export	HS0802908010	Macadamia nuts, fresh or dried, in shell.
		HS0802909010	Macadamia nuts, fresh or dried, shelled.
		HS2008199010	Macadamia nuts, prepared or preserved NESOI.
	U.S. mainland		No production
	Hawaii		Wet in Shell. 13% of the production is assumed consumed locally (authors' estimation). FAS value.

Notes \* Harmonized Tariff Schedule of the United States and Schedule B Export Codes.  
Imports and exports are in custom value.

Product	Supplier	Trade Code*	Description
<b>Coffee</b>	Import/Export	HS090111	Coffee, not roasted, not decaffeinated.
		HS090112	Coffee, not roasted, decaffeinated.
		HS090121	Coffee, roasted, not decaffeinated.
		HS090122	Coffee, roasted, decaffeinated.
	U.S. mainland		No production.
Hawaii		Parchment equivalent. Local consumption is assumed small. FAS value.	
<b>Seed Corn</b>	Import/Export	HS0712908550	Sweet corn seeds of a kind used for sowing, dried.
		HS0712908050	Sweet corn seeds of a kind used for sowing, dried.
	U.S. mainland		The U.S. mainland market is estimated based on the total crop acreage and average-seeding rate. Prices from Agricultural Statistics (USDA).
	Hawaii		Outshipment value is available.
<b>Anthurium, Cut</b>	Import/Export	HS 603107040	Anthuriums, fresh.
	Hawaii's Export	HS 603100000	Cut flowers and flowers buds, fresh. Proportion of anthurium is estimated based on the total outshipment (U.S. mainland and foreign) of anthurium and dendrobium.
	U.S. mainland		No production.
	Hawaii		Outshipment (U.S. mainland and foreign) value is available.
<b>Dendrobium, Sprays</b>	Import/Export	HS603107050	Dendrobium orchids, fresh.
	Hawaii's Export	HS 603100000	Proportion of dendrobium is estimated based on the total outshipment (U.S. mainland and foreign) of anthurium and dendrobium.
	U.S. mainland		No production.
	Hawaii		Dendrobium sprays. Outshipment value (U.S. mainland and foreign) is available.
<b>Potted Orchids</b>	Import/Export	HS602902000	Orchids plants live.
		HS602992000	Orchids plants, live.
	U.S. mainland		Potted orchids, Floriculture Crops, NASS.
Hawaii		It includes potted dendrobium , oncidium , phalaenopsis and others. Outshipment value (U.S. mainland and foreign) is available.	
<b>Foliages</b>	Import	HS604910080	Foliage, branches and parts of plants without flowers or buds, and grasses suitable for bouquets or for ornamental purposes, fresh, NESOI.
	Export	HS604910000	Foliage, branches and parts of plants without flowers or buds, and grasses suitable for bouquets or for ornamental purposes, fresh, NESOI.
	U.S. mainland		Foliages. Floriculture and Nursery Crops situation and Outlook Yearbook
	Hawaii		It includes Ti leaves, other cut greens, and potted foliage. Outshipment value (U.S. mainland and foreign) is available.

Notes \* Harmonized Tariff Schedule of the United States and Schedule B Export Codes.

Imports and exports are in custom value.