TABLE 5
Cultured shrimp export performance in the Japanese market

Region	Country	First period (early-1990s to mid-1990s)						Second period (mid-1990s to early-2000s)					
		Market share (%)				RCA indices		Market share (%)				RCA indices	
		Initial	Total variation	Size variation	Structural variation	Initial	RCAV	Initial	Total variation	Size variation	Structural variation	Initial	RCAV
Africa	Madagascar	0.0	0.0	0.0	0.0	0.8	0.06	0.0	0.1	0.1	-0.1	0.9	-0.32
	Africa	**0.0**	**0.0**	**0.0**	**0.0**	**0.8**	**0.06**	**0.0**	**0.1**	**0.1**	**-0.1**	**0.9**	**-0.32**
Central America	Belize	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.00
	Costa Rica	0.0	0.0	0.0	0.0	0.0	-0.03	0.0	0.0	0.0	0.0	0.0	0.00
	Guatemala	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.03
	Honduras	0.0	0.0	0.0	0.0	0.0	0.02	0.0	0.0	0.0	0.0	0.0	-0.02
	Mexico	0.0	0.1	0.1	0.0	0.2	-0.05	0.1	0.1	0.1	0.0	0.1	-0.02
	Nicaragua	0.0	0.2	0.0	0.2	0.0	0.19	0.2	0.2	0.0	0.2	0.2	0.11
	Central America	**0.0**	**0.3**	**0.0**	**0.3**	**0.0**	**0.07**	**0.4**	**0.3**	**0.2**	**0.1**	**0.1**	**0.01**
South America	Brazil	0.1	0.0	-0.1	0.1	1.0	1.09	0.2	0.7	7.0	-6.2	2.2	-2.21
	Colombia	0.8	-0.2	-0.1	-0.1	0.5	-0.06	0.6	0.0	0.1	-0.1	0.4	-0.03
	Ecuador	0.1	5.5	0.0	5.5	0.0	0.23	5.6	-2.5	-3.5	1.0	0.2	0.10
	Panama	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.00
	Peru	0.0	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.0	0.0	0.0	-0.01
	Venezuela (Bolivarian Republic of)	0.0	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.0	0.0	0.0	-0.02
	South America	**1.0**	**5.4**	**0.1**	**5.3**	**0.0**	**0.19**	**6.3**	**-1.8**	**-2.8**	**1.0**	**0.2**	**0.06**
East Asia	China	13.3	-12.1	-12.4	0.3	1.1	0.35	1.2	2.6	4.0	-1.4	1.5	-0.42
	Republic of Korea	1.0	-0.8	-0.7	0.0	2.4	-0.44	0.2	-0.2	0.0	-0.2	2.3	-2.28
	East Asia	**14.4**	**-12.9**	**-13.3**	**0.4**	**1.1**	**0.39**	**1.5**	**2.4**	**4.3**	**-1.9**	**1.5**	**-0.56**
Middle East	Iran (Islamic Republic of)	0.0	0.0	0.0	0.0	0.2	0.76	0.0	0.1	0.4	-0.3	1.0	-0.67
	Saudi Arabia	0.0	0.0	0.0	0.0	0.0	1.23	0.0	0.0	0.1	-0.1	1.2	-1.18
	Middle East	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.99**	**0.0**	**0.1**	**0.6**	**-0.4**	**1.0**	**-0.75**
South Asia	Bangladesh	3.6	2.2	0.2	2.0	0.5	0.23	5.8	-2.8	0.3	-3.1	0.7	-0.33
	India	4.2	4.9	2.9	2.0	1.5	0.43	9.1	2.5	6.2	-3.7	2.0	-0.57
	Sri Lanka	1.1	1.8	1.4	0.4	2.0	0.35	2.9	1.6	2.2	-0.6	2.5	-0.35
	South Asia	**8.9**	**8.9**	**2.3**	**6.6**	**0.8**	**0.46**	**17.8**	**1.3**	**4.9**	**-3.6**	**1.2**	**-0.21**
Southeast Asia	Indonesia	28.3	3.3	-1.1	4.4	1.9	0.33	31.6	-6.0	-2.3	-3.7	2.4	-0.37
	Malaysia	0.0	0.6	0.5	0.1	0.9	0.18	0.6	1.1	0.8	0.2	1.0	0.17
	Myanmar	0.0	0.6	0.1	0.5	0.2	0.68	0.7	1.8	0.9	0.9	0.8	0.52
	Philippines	7.4	-4.0	-4.2	0.2	2.0	0.15	3.4	0.2	0.0	0.3	2.3	0.21
	Thailand	34.3	-4.0	7.7	-11.6	1.3	-0.36	30.4	-9.9	-3.5	-6.4	0.9	-0.22
	Viet Nam	5.3	1.5	0.2	1.3	1.6	0.37	6.8	9.9	15.1	-5.2	1.9	-0.54
	Southeast Asia	**75.4**	**-2.0**	**7.5**	**-9.5**	**1.5**	**-0.18**	**73.4**	**-3.0**	**5.8**	**-8.8**	**1.4**	**-0.17**
Oceania	Australia	0.3	0.2	0.1	0.1	1.8	0.29	0.6	0.5	0.6	-0.1	2.2	-0.27
	New Caledonia	0.0	0.0	0.0	0.0	0.1	0.22	0.0	0.1	0.0	0.1	0.3	1.16
	Oceania	**0.3**	**0.2**	**0.2**	**0.1**	**1.8**	**0.20**	**0.6**	**0.6**	**0.8**	**-0.1**	**2.1**	**-0.29**

During the first period, from the early to mid-1990s, Indonesia's world market share declined from 15 to 13 percent. Yet its Japan market share has nevertheless increased from 28 to 32 percent. In other words, despite the size advantage decline, Indonesia was still able to increase its degree of dominance in the Japan market through comparative advantage gains.

As shown in Table 5, Indonesia's total market share variation in the Japanese market during the first period was 3.3 percent, which can be decomposed into -1.1 percent of size variation and 4.4 percent of structural variation. The negative size variation implies that had Indonesia maintained its comparative advantage pattern during the first period, it would have yielded 1.1 percent of the Japanese market. Yet, the country has actually gained 3.3 percent because of the 4.4 percent of structural variation that reflects its comparative advantage gains in the Japan market.

During the first period, contrary to Indonesia (which had lost world market share yet had gained market share in Japan), Thailand increased its world market share from 27 to 32 percent yet reduced its Japan market share from 34 to 30 percent. The 4 percent of its Japan market share decline is the result of an 8 percent size gain in tandem with a 12 percent of structural decline.

During the second period (from the mid-1990s to the early-2000s), Indonesia further reduced its world market share from 13 to 10 percent while its Japan market share went from 32 to 26 percent. This 6 percent decline in Japanese market share was caused by a 2.3 percent of size decline as well as a 3.7 percent of structural decline. Thailand had a similar experience and reduced its world market share from 32 to 29 percent and its Japan market share from 30 to 20 percent. This 10 percent decline in Japanese market share was caused by a 3.5 percent of size decline in addition to a 6.4 percent of structural decline (Table 5).

China and the Philippines

In the early 1990s, China and the Philippines were the third and fourth largest exporters to the Japanese market, respectively controlling 13 and 7.4 percent of the market (Figure 3a). They also had large revealed comparative advantages in the market with *RCA* indices of 1.1 and 2.0 respectively. However, both countries reduced their Japan market power significantly during the first period (Table 5). China lost nearly the entire 13 percent of its Japan market share because of the collapse of its cultured shrimp production caused by disease outbreaks in 1993 (Table 3). The Philippines expanded its annual cultured shrimp production from 61 000 to 70 000 tonnes during this period; yet this expansion was not sufficient to prevent the decline of its Japan market share from 7.4 to 3.4 percent. The RCAV indices reveal that their declining dominance in the Japan market was caused completely by a size advantage decline (Table 5).

With its annual cultured shrimp production rising from 90 000 to 300 000 tonnes, China increased its Japan market share by 2.6 percent during the second period, which was the result of a 4 percent size gain together with a 1.4 percent of structural decline. The Philippines also increased its Japanese market share slightly from 3.4 to 3.6 percent, which was mainly due to a comparative advantage gain (Table 5).

Viet Nam

Viet Nam, a rising star in the shrinking Japanese market, increased its market share from 5.3 percent in the early 1990s to 6.8 percent in the mid-1990s, and then to 17 percent in the early 2000s (Figure 3). While the expansion during the first period was mainly a structural effect due to its comparative advantage gain in the Japan market, the expansion during the second period was completely a size effect corresponding to an increase in its world market share from 3.5 percent in the mid-1990s to 10 percent in the early 2000s (Table 5).

Bangladesh, India and Sri Lanka
In the early 1990s, Bangladesh, India and Sri Lanka held 3.6, 4.2 and 1.1 percent of the Japanese market, respectively. While India and Sri Lanka had strong revealed comparative advantage in the market with *RCA* indices of 1.5 and 2.0 respectively, Bangladesh's *RCA* index was only 0.5.

During the first period all these three South Asian countries increased their Japan market shares through gains in both size and comparative advantage (Figure 3 and Table 5). During the second period all three countries reduced their comparative advantage in the Japanese market (Table 5). While India and Sri Lanka can still manage to increase their shares in the market through size advantage gain, Bangladesh (whose size advantage gain was not sufficient to overcome its comparative advantage decline), had to yield some of its Japan market share.

Other countries
Information on other countries' frozen cultured shrimp export performance in the Japanese market can be found in Table 5.

Asian-Pacific dominance
The Japanese market has been dominated by Asian-Pacific countries. Ecuador is the only non-Asian-Pacific country that has ever obtained non-trivial market power in the Japanese market. Its Japan market share was 5.6 percent in the mid-1990s but it nevertheless declined to 3.1 percent in the early 2000s (Figure 3).

The Asian-Pacific dominance in the Japan market is evident not only in terms of market power but also in terms of comparative advantage – Brazil is the only non-Asian-Pacific country that has ever had strong comparative advantage in the Japanese market (Table 5). However, not all Asian countries have strong comparative advantage in the Japanese market. Bangladesh is the only Asian country that never enjoyed strong comparative advantage. Iran (Islamic Republic of) and Saudi Arabia in the Middle East had only a transitory strong comparative advantage in the mid-1990s. Thailand had a strong comparative advantage in the early 1990s but it has weakened since the mid-1990s. Interestingly, Korea (the closest neighbour to Japan) had only a weak comparative advantage by the early 2000s.

Competition intensity
The Japanese market has become increasingly competitive in the sense that market shares have been distributed more and more evenly across countries. While over 60 percent of the market was controlled by only two countries (Indonesia and Thailand) in the early and mid-1990s, Viet Nam also emerged as a top supplier by the early 2000s (Figure 3). In general, the cumulative market share curves in Figure 3d indicate that the Japan market share has become less concentrated in the early 2000s than in the early 1990s.

Comparative advantage variation
According to the *RCAV* indices in Table 5, the following countries have gained comparative advantage in the Japanese market during both study periods: Myanmar, Malaysia and the Philippines in Southeast Asia; Nicaragua in Central America; and Ecuador in South America. On the contrary, Thailand, Republic of Korea, Mexico and Colombia have reduced their comparative advantage.

3.3.2 The United States of America market
Rapid economic growth in the United States during the 1990s increased the country's consumption of the world frozen cultured shrimp exports from 38 percent in the early 1990s to 40 percent in the mid-1990s, and then to 48 percent in the early 2000s, when it became the largest international frozen cultured shrimp market (Figure 2c).

South America and Southeast Asia are the two major exporters to this market; yet both have reduced their exports recently. Central America and South Asia have relatively smaller cultured shrimp exports to the United States market; however, their respective shares have been increasing in the most recent years. East Asian (mainly China) exports to the United States were at the same level as Southeast Asia in the early 1990s; this market share collapsed to nearly zero since 1993 as a consequence of declining shrimp farming. The recovery of the Chinese industry in the early 2000s led to a reactivation of shrimp exports. China became the second largest frozen shrimp exporter (in terms of quantity) to the United States in 2003.

Ecuador and Thailand

Ecuador and Thailand are the two most dominant exporters to the United States. market (Figure 4). In the early 1990s Ecuador accounted for 22 percent of the world market while Thailand represented 27 percent. In contrast, Ecuador's share in the United States (39 percent) exceeded that of Thailand (23 percent). This reflects Ecuador's much stronger comparative advantage in the United States market (with an *RCA* index of 1.7) than Thailand (with an *RCA* index of 0.8).

During the first period, Thailand raised its United States market share significantly by 11 percent (from 23 to 34 percent) through 5 percent of size gain and 6 percent of structural gain. In contrast, Ecuador reduced its United States market share from 39 to 36 percent because of its declining comparative advantage (Table 6). During the second period, Ecuador's United States market share declined further to only 13 percent

FIGURE 4
Cultured shrimp exports to the United States of America market

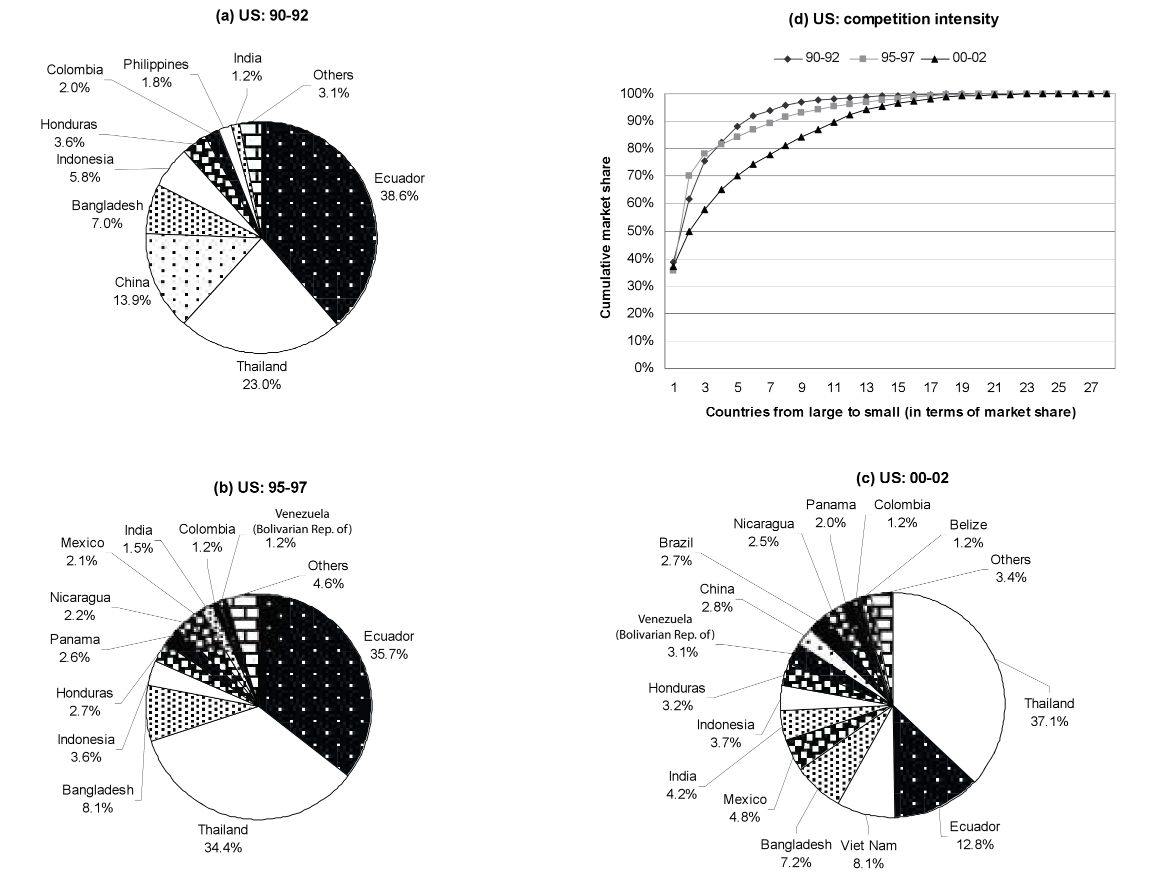


TABLE 6
Cultured shrimp export performance in the United States of America market

Region	Country	First period (early 1990s to mid-1990s)						Second period (mid-1990s to early 2000s)					
		Market share (%)				RCA indices		Market share (%)				RCA indices	
		Initial	Total variation	Size variation	Structural variation	Initial	RCAV	Initial	Total variation	Size variation	Structural variation	Initial	RCAV
Africa	Madagascar	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.00
	Africa	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.00**
Central America	Belize	0.1	0.3	0.2	0.1	1.7	0.75	0.4	0.7	0.8	-0.1	2.3	-0.17
	Costa Rica	0.1	0.4	0.4	0.0	1.6	-0.02	0.4	-0.1	-0.1	0.0	1.5	-0.06
	Guatemala	0.4	0.4	0.4	-0.1	1.8	-0.14	0.8	0.0	0.1	-0.1	1.6	-0.22
	Honduras	3.6	-0.8	-0.4	-0.5	2.5	-0.34	2.7	0.5	0.6	-0.1	2.0	-0.04
	Mexico	0.5	1.6	1.6	0.0	2.4	-0.02	2.1	2.7	2.7	0.0	2.3	0.02
	Nicaragua	0.3	1.9	1.2	0.7	1.3	0.56	2.2	0.3	0.1	0.1	1.8	0.08
	Central America	**5.0**	**3.7**	**4.5**	**-0.8**	**2.2**	**-0.18**	**8.7**	**4.1**	**3.8**	**0.3**	**2.0**	**0.04**
South America	Brazil	0.2	-0.1	-0.1	-0.1	1.1	-0.61	0.0	2.7	1.8	0.9	0.6	0.30
	Colombia	2.0	-0.8	-0.3	-0.5	1.3	-0.37	1.2	0.0	0.2	-0.2	0.9	-0.11
	Ecuador	38.6	-2.9	0.3	-3.2	1.7	-0.13	35.7	-22.9	-22.3	-0.6	1.5	-0.06
	Panama	0.3	2.4	2.4	0.0	2.3	-0.01	2.6	-0.6	-0.7	0.1	2.2	0.11
	Peru	0.8	0.0	0.1	-0.1	1.9	-0.19	0.8	-0.7	-0.7	0.0	1.6	0.02
	Venezuela (Bolivarian Republic of)	0.2	1.0	0.6	0.4	1.4	0.56	1.2	1.9	1.9	0.0	1.9	0.01
	South America	**42.0**	**-0.4**	**2.4**	**-2.8**	**1.7**	**-0.10**	**41.6**	**-19.7**	**-18.1**	**-1.6**	**1.5**	**-0.09**
East Asia	China	13.9	-13.3	-12.9	-0.4	1.1	-0.50	0.5	2.3	1.8	0.5	0.6	0.15
	Republic of Korea	0.0	0.0	0.0	0.0	0.0	0.18	0.0	0.0	0.0	0.0	0.2	-0.23
	East Asia	**13.9**	**-13.3**	**-12.8**	**-0.5**	**1.1**	**-0.52**	**0.6**	**2.2**	**1.6**	**0.6**	**0.6**	**0.18**
Middle East	Iran (Islamic Republic of)	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.1	0.0	0.1	0.0	0.12
	Saudi Arabia	0.0	0.0	0.0	0.0	0.0	0.17	0.0	0.2	0.0	0.1	0.2	1.65
	Middle East	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.03**	**0.0**	**0.2**	**0.0**	**0.2**	**0.0**	**0.37**
South Asia	Bangladesh	7.0	1.1	0.4	0.7	0.9	0.08	8.1	-0.8	0.4	-1.3	0.9	-0.13
	India	1.2	0.4	0.8	-0.4	0.4	-0.09	1.5	2.7	1.1	1.6	0.3	0.25
	Sri Lanka	0.2	0.1	0.3	-0.2	0.4	-0.19	0.3	0.3	0.2	0.1	0.3	0.07
	South Asia	**8.4**	**1.6**	**2.2**	**-0.7**	**0.8**	**-0.05**	**9.9**	**2.2**	**2.7**	**-0.6**	**0.7**	**-0.03**
South-east Asia	Indonesia	5.8	-2.3	-0.2	-2.0	0.4	-0.15	3.6	0.1	-0.3	0.3	0.3	0.03
	Malaysia	0.0	0.1	0.2	-0.2	0.4	-0.29	0.1	0.2	0.1	0.1	0.1	0.09
	Myanmar	0.1	0.0	0.1	-0.1	0.3	-0.16	0.1	0.6	0.1	0.5	0.1	0.33
	Philippines	1.8	-1.5	-1.0	-0.4	0.5	-0.29	0.4	0.0	0.0	0.0	0.3	-0.04
	Thailand	23.0	11.4	5.1	6.2	0.8	0.19	34.4	2.7	-3.9	6.6	1.1	0.23
	Viet Nam	0.0	0.8	0.0	0.8	0.0	0.21	0.8	7.3	1.7	5.7	0.2	0.59
	Southeast Asia	**30.7**	**8.5**	**3.1**	**5.4**	**0.6**	**0.10**	**39.2**	**10.9**	**3.1**	**7.8**	**0.8**	**0.15**
Oceania	Australia	0.0	0.0	0.0	0.0	0.1	-0.06	0.0	0.0	0.0	0.0	0.0	0.03
	New Caledonia	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.15
	Oceania	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**-0.06**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.05**

because of a size-advantage decline caused by shrimp diseases that reduced the country's shrimp production by half (Tables 3 and 6). Thailand has also reduced its size advantage in the United States market during the second period; however, its United States market share nevertheless increased from 34 to 37 percent through comparative advantage gains (Table 6).

China

In the early 1990s, China controlled 14 percent of the United States market where it had a strong comparative advantage (*RCA* index = 1.1). However, as its world market share fell from 12 percent in the early 1990s to 0.8 percent in the mid-1990s (due to the disease-induced shrimp farming collapse in 1993), its United States market share declined even more severely (from 14 to 0.5 percent). According to the *RCAV* indices for the first period, China's comparative advantage in the United States declined but it then increased in both the Japanese and EU markets (Tables 5–7).

During the second period, China increased its world and United States market shares to 3.3 and 2.8 percent, respectively.[18] *RCAV* indices during this period indicate that China has gained comparative advantage in the United States market in detriment of the Japan and EU markets (Tables 5-7).

Viet Nam, India, Mexico and Brazil

Viet Nam, India, Mexico and Brazil have been performing as four rising stars in the United States market, jointly supplying 20 percent of exports in the early 2000s (Table 6). Viet Nam increased its United States market share from less than 1 percent in the mid-1990s to 8 percent in the early 2000s through 2 percent of size and 6 percent of structural gain. India held 1.2 percent of the United States market in the early 1990s and then 1.5 percent in the mid-1990s through size gains; its share increased significantly to 4.2 percent in the early 2000s through 1.1 percent of size and 1.6 percent of structural gain (Table 6).

Mexico has maintained a very strong comparative advantage in the United States market with an *RCA* index consistently above 2. Its size advantage gains driven by rapid shrimp farming growth increased its United States market share from 0.5 percent in the early 1990s to 2.1 percent in the mid-1990s and 4.8 percent in the early 2000s. On the other hand, Brazil increased its annual cultured shrimp production significantly from 3 000 tonnes in the mid-1990s to 42 000 tonnes in the early 2000s. Accordingly, its United States market share increased from nearly zero to 3 percent through 1.8 percent of size and 0.9 percent of structural gain (Table 6).

Other countries

Information on other countries' frozen cultured shrimp export performance in the United States market can be found in Table 6.

Regional dominance in the United States market

As far as market share is concerned, South America was the most dominant exporter to the United States market in the early and mid-1990s, controlling 42 percent of the market. Yet this share had declined to 22 percent by the early 2000s; by then, Southeast Asia was the most important supplier. The region increased its United States market share from 31 percent in the early 1990s to 39 percent in the mid-1990s and 50 percent in the early-2000s. Central America and South Asia also gained market power in the United States during both periods (Table 6).

[18] China's frozen cultured shrimp export performance might be underrated by the way we estimate cultured shrimp exports based on total shrimp exports; see footnote 17.

With regard to revealed comparative advantage, the Latin American dominance in the United States market is as evident as the Asian-Pacific dominance is in the Japan market (Table 6). China in the early 1990s, Thailand in the mid-1990s and early 2000s, and Saudi Arabia in the early 2000s have been the only non-Latin American countries to enjoy strong comparative advantage in the United States market. On the other hand, Brazil in the mid-1990s and Colombia in the mid-1990s and early 2000s were the only Latin American countries to exhibit weak comparative advantage in the United States market.

Competitive intensity
As previously observed in Japan, the United States market has become increasingly competitive, especially in the early 2000s (Figure 4d). While only two countries (Ecuador and Thailand) controlled 70 percent of the United States market in the mid-1990s, five countries accounted for that share in the early 2000s. Similarly, while six countries controlled 90 percent of the market in the early 1990s, 12 countries accounted for the same market share in the early 2000s.

Comparative advantage variation
Thailand, Viet Nam, Nicaragua and Venezuela (Bolivarian Republic of) exhibited comparative advantage gains in the United States. market during both periods. Belize, Bangladesh and the Republic of Korea enjoyed comparative advantage gains during the first period but declines during the second one. Brazil, Mexico, Panama, Peru, Myanmar, Malaysia, Indonesia, Australia, India, Sri Lanka and China experienced a decline in comparative advantage during the first period yet recorded gains during the second.

Most of the countries with falling comparative advantage during both periods (i.e. Honduras, Costa Rica, Guatemala, Ecuador and Colombia) are in Latin America; the only exception is the Philippines (Table 6).

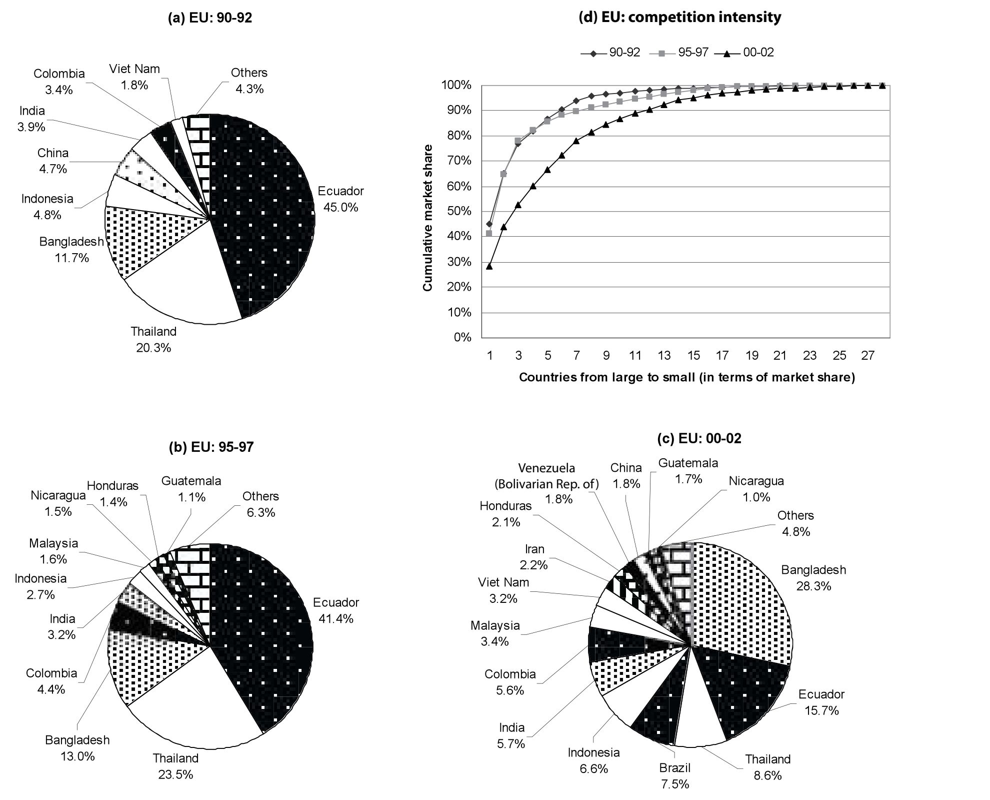
3.3.3 The European Union market
Relative to Japan and the United States, the EU market has been relatively small, absorbing 15, 16 and 17 percent of the world frozen cultured shrimp exports in the early 1990s, mid-1990s and early 2000s, respectively. However, its absolute size grew significantly through the late 1990s (Figure 2d). As compared to Japan and the United States, the EU market has been more competitive in the sense that market shares have been distributed more evenly across exporters (Figure 5).

South America was the largest exporter to the market in the 1990s, followed by Southeast Asia (Figure 2d). Both regions reduced their EU exports in the early 2000s while South Asia became the largest exporter by the same time period. The market shares of Central America, Middle East and East Asia have been relatively small.

Ecuador, Thailand and Bangladesh
Ecuador, Thailand and Bangladesh were the three most dominant countries in the EU market in the early 1990s. Ecuador held 45 percent of the market in the early 1990s and was the number one exporter (Figure 5). Its share fell slightly to 41 percent in the mid-1990s because of a declining comparative advantage, and then it dropped further to only 16 percent in the early 2000s because of a declining size advantage (Table 7).

Thailand was the second largest exporter to the EU market in the early and mid-1990s and the third largest in the early 2000s (Figure 5). Yet its comparative advantage in the market has been weak and declining (Table 7). Bangladesh increased its EU market share from 13 percent in the mid-1990s to 28 percent in the early 2000s when it replaced Ecuador as the number one exporter. A gain in comparative advantage was the main driving force behind this 15 percent surge (Table 7); in contrast, the country's

FIGURE 5
Cultured shrimp exports to the European Union market



world market share increased only slightly from 8.7 to 9.5 percent during the same period.

Brazil

In addition to Bangladesh, Brazil recorded large comparative advantage gains during the second period (Table 7). Seven points of its 7.5 percent market share gain during the second period was due to gains in comparative advantage.

Colombia, India and Indonesia

The shares of Colombia, India and Indonesia in the EU market have been relatively large and stable. Colombia had a strong and increasing comparative advantage during the entire study period, which helped increase its market share from 3.4 percent in the early 1990s to 4.4 percent in the mid-1990s and 5.6 percent in the early 2000s (Table 7).

Indonesia reduced its market share from 4.8 percent in the early 1990s to 2.7 percent in the mid-1990s because of further declines in its already weak comparative advantage position. Yet a subsequent comparative advantage gain during the second period helped raise the country's market share to 6.6 percent in the early 2000s (Table 7). India reduced its EU market share from 3.9 to 3.2 percent during the first period because of a decline in comparative advantage (from strong to weak) and then raised it to 5.7 percent in the early 2000s because of a size advantage gain (Table 7).

Other countries

Information on other countries' frozen cultured shrimp export performance in the EU market can be found in Table 7.

TABLE 7
Cultured shrimp export performance in the European Union market

Region	Country	First period (early 1990s to mid-1990s)						Second period (mid-1990s to early 2000s)					
		Market share (%)				RCA indices		Market share (%)				RCA indices	
		Initial	Total variation	Size variation	Structural variation	Initial	RCAV	Initial	Total variation	Size variation	Structural variation	Initial	RCAV
Africa	Madagascar	0.1	0.1	0.1	0.0	4.0	0.19	0.2	0.7	0.6	0.1	4.1	0.62
	Africa	**0.1**	**0.1**	**0.1**	**0.0**	**4.0**	**0.19**	**0.2**	**0.7**	**0.6**	**0.1**	**4.1**	**0.62**
Central America	Belize	0.1	-0.1	0.2	-0.3	1.6	-1.33	0.0	0.5	0.1	0.4	0.2	0.60
	Costa Rica	0.1	0.6	0.6	0.0	2.5	0.10	0.7	-0.1	-0.1	0.1	2.5	0.18
	Guatemala	0.5	0.7	0.5	0.1	2.1	0.29	1.1	0.6	0.2	0.4	2.3	0.64
	Honduras	0.5	0.9	0.0	1.0	0.3	0.73	1.4	0.7	0.3	0.4	1.1	0.20
	Mexico	0.0	0.1	0.0	0.1	0.0	0.14	0.1	0.1	0.2	0.0	0.1	-0.02
	Nicaragua	0.7	0.8	2.8	-1.9	3.0	-1.59	1.5	-0.5	0.1	-0.6	1.2	-0.37
	Central America	**1.9**	**3.0**	**1.7**	**1.3**	**0.8**	**0.30**	**4.9**	**1.4**	**2.2**	**-0.8**	**1.1**	**-0.11**
South America	Brazil	0.1	-0.1	-0.1	-0.1	0.9	-0.81	0.0	7.5	0.5	7.0	0.1	2.49
	Colombia	3.4	1.0	-0.5	1.5	2.1	1.07	4.4	1.2	0.6	0.6	3.2	0.35
	Ecuador	45.0	-3.5	0.3	-3.8	2.0	-0.16	41.4	-25.7	-25.9	0.2	1.7	0.02
	Panama	0.1	0.7	0.7	0.0	0.7	0.02	0.8	-0.5	-0.2	-0.3	0.7	-0.32
	Peru	0.7	0.2	0.1	0.1	1.8	0.27	0.9	-0.8	-0.8	0.0	2.0	-0.30
	Venezuela (Bolivarian Republic of)	0.4	0.5	1.5	-1.0	3.1	-1.52	0.9	0.9	1.5	-0.6	1.5	-0.30
	South America	**49.7**	**-1.2**	**2.9**	**-4.1**	**2.0**	**-0.15**	**48.5**	**-17.5**	**-21.1**	**3.6**	**1.8**	**0.20**
East Asia	China	4.7	-4.0	-4.4	0.4	0.4	0.49	0.8	1.0	2.4	-1.4	0.9	-0.41
	Republic of Korea	0.1	-0.1	-0.1	0.0	0.2	-0.16	0.0	0.3	0.0	0.3	0.0	4.29
	East Asia	**4.8**	**-4.1**	**-4.5**	**0.4**	**0.4**	**0.41**	**0.8**	**1.4**	**2.2**	**-0.8**	**0.8**	**-0.25**
Middle East	Iran (Islamic Republic of)	0.0	0.1	0.1	0.0	5.6	-1.47	0.1	2.1	1.7	0.4	3.9	0.85
	Saudi Arabia	0.0	0.0	0.0	0.0	5.3	-4.07	0.0	0.0	0.1	-0.1	0.7	-0.75
	Middle East	**0.0**	**0.1**	**0.1**	**0.0**	**5.3**	**-1.45**	**0.1**	**2.1**	**1.8**	**0.3**	**3.3**	**0.56**
South Asia	Bangladesh	11.7	1.2	0.7	0.5	1.6	0.06	13.0	15.3	0.7	14.6	1.5	1.54
	India	3.9	-0.7	2.7	-3.4	1.4	-0.76	3.2	2.5	2.2	0.3	0.7	0.05
	Sri Lanka	0.2	-0.1	0.2	-0.4	0.3	-0.31	0.1	0.3	0.0	0.3	0.1	0.19
	South Asia	**15.8**	**0.4**	**4.2**	**-3.8**	**1.5**	**-0.27**	**16.2**	**18.2**	**4.5**	**13.7**	**1.1**	**0.78**
Southeast Asia	Indonesia	4.8	-2.1	-0.2	-1.9	0.3	-0.14	2.7	3.9	-0.2	4.1	0.2	0.41
	Malaysia	0.0	1.5	0.9	0.7	1.6	1.07	1.6	1.9	2.1	-0.3	2.5	-0.21
	Myanmar	0.1	0.4	0.4	0.0	0.9	0.04	0.6	0.2	0.7	-0.6	0.7	-0.34
	Philippines	0.3	-0.3	-0.2	-0.1	0.1	-0.06	0.0	0.2	0.0	0.2	0.0	0.19
	Thailand	20.3	3.1	4.5	-1.4	0.7	-0.04	23.5	-14.9	-2.7	-12.3	0.7	-0.42
	Viet Nam	1.8	-0.9	0.1	-1.0	0.6	-0.29	0.9	2.3	2.0	0.3	0.3	0.03
	Southeast Asia	**27.4**	**1.8**	**2.7**	**-0.9**	**0.6**	**-0.02**	**29.2**	**-6.5**	**2.3**	**-8.8**	**0.6**	**-0.17**
Oceania	Australia	0.2	-0.1	0.1	-0.3	1.3	-1.00	0.1	0.1	0.1	0.0	0.3	0.11
	New Caledonia	0.0	0.0	0.0	0.0	3.0	1.48	0.0	0.1	0.2	-0.1	4.0	-1.46
	Oceania	**0.2**	**-0.1**	**0.1**	**-0.2**	**1.3**	**-0.83**	**0.1**	**0.3**	**0.2**	**0.1**	**0.5**	**0.18**

Regional dominance in the European Union market

With regard to market power, three regions reduced their market shares during the entire study period (South America from 50 to 31 percent, Southeast Asia from 27 to 23 percent, and East Asia from 4.8 to 2.1 percent); the other 5 regions increased their shares (South Asia from 16 to 34 percent, Central America from 1.9 to 6.3 percent, the Middle East from virtually zero to 2.2 percent, Africa from 0.1 to 0.9 percent, and Oceania from 0.2 to 0.4 percent).

With regard to revealed comparative advantage, the EU market is more diversified than the Japanese and United States markets. While countries with strong comparative advantage in the Japanese and United States markets are concentrated in the Asian-Pacific and Latin American regions respectively, there has been at least one country from every region (except East Asia) with strong comparative advantage in the EU market during the entire period from the early 1990s to the early 2000s (Costa Rica and Guatemala in Central America; Colombia, Ecuador, Peru and Venezuela (Bolivarian Republic of) in South America; Iran (Islamic Republic of) in the Middle East; Bangladesh in South Asia; Malaysia in Southeast Asia; New Caledonia in Oceania; and Madagascar in Africa). Even South Korea from East Asia enjoyed very strong comparative advantage gains by the early 2000s (Table 7).

Five out of nine countries with weak comparative advantage in the EU market during the entire study period are from Southeast Asia (Indonesia, Myanmar, Philippines, Thailand and Viet Nam); the other six countries are Mexico, Panama, China and Sri Lanka.

Competitive intensity

Similar to the Japanese and United States markets, the EU market has also become increasingly competitive, especially in the early 2000s (Figure 5d). While the four top countries controlled over 80 percent of the market in the mid-1990s, eight countries accounted for the same market share in the early 2000s.

Comparative advantage variation

According to the *RCAV* indices, New Caledonia, Malaysia, Colombia, Honduras, China, Guatemala, Peru, Madagascar, Mexico and Costa Rica were the 10 countries with the largest comparative advantage gains in the EU market during the first period. For the same period, Saudi Arabia, Nicaragua, Venezuela (Bolivarian Republic of), Iran (Islamic Republic of), Belize, Australia, Brazil, India, Sri Lanka and Viet Nam were the 10 countries with the largest comparative advantage declines (Table 7).

During the second period (from the mid-1990s to the early 2000s), Republic of Korea, Brazil, Bangladesh, Iran (Islamic Republic of), Guatemala, Madagascar, Belize, Indonesia, Colombia and Honduras were the 10 countries with the largest comparative advantage gains in the market, while Thailand, New Caledonia, Saudi Arabia, China, Nicaragua, Myanmar, Panama, Venezuela (Bolivarian Republic of), Peru, Malaysia and Mexico saw declines in their comparative advantage (Table 7).

3.4 Summary

We have presented a systematic and comparative assessment of 28 major shrimp farming countries' performance in three major international frozen cultured shrimp export markets (Japan, the United States and EU). We used market share as a basic export performance indicator to measure countries' degree of dominance in a market. We identified "size advantage" and "comparative advantage" as two factors behind the degree of dominance. Dynamically, we used the temporal variation in market shares to gauge changes in market power; we also decomposed total market share variation into "size variation" and "structural variation" in order to identify the "size" and "structural" sources of the variation. We also defined the RCAV index to compare countries' comparative advantage variation over time.

We found that all the three markets have become more competitive between the early 1990s and the early 2000s in the sense that market power has become less concentrated. We also found that the Asian-Pacific countries overwhelmingly dominate the Japanese market in terms of not only market power but also comparative advantage. We also found that most of the countries with strong comparative advantage in the United States market are from Latin America while most Latin American countries enjoy a strong advantage in the United States market. However, we did not find any obvious regional dominance pattern of comparative advantage in the EU market.

Limited by space considerations, we have only discussed the performance of some relatively large cultured shrimp exporting countries in each of the three markets; the analysis results for the entire set of 28 countries under investigation are reported in Tables 5–7.

The systematic and comparative account of countries' frozen cultured shrimp export performance as undertaken here represents an initial research effort; further research examining exporters and markets in greater detail is necessary to explain performance and identify the driving forces behind market dynamics.