An Industry Perspective of Alternative Ports of Entry for Latin American Fruit and Vegetable Imports

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Trade is a venue for economic development and diversification. U.S. concerns focus on exports. However, imports of counter-seasonal produce items stimulate port activity. At ports used for these products, a marketing infrastructure develops that can be useful to the domestic produce industry. Most imported produce enters at Miami or along the Delaware river. Use of Gulf of Mexico ports could shorten transportation distance for Latin American product destined for Southern and Midwestern U.S. markets. This paper reports results of a survey designed to reveal industry perceptions of the physical and marketing infrastructure, and marketing advantages and constraints, offered by selected Gulf ports.

Introduction

Fresh fruit and vegetable (FFV) and cut flower imports serve the U.S. market both as counter seasonal supplements to domestic production and as a primary source for products not grown domestically. Originating in the Southern Hemisphere and the Tropics, volume has increased significantly during the past two decades due to improved transportation, postharvest technologies, and the development of sturdier varieties. These products have attracted the interest of water ports and airports because of their volume and because they are intensive users of port services. In anticipation of increases in global trade volume, governments, port authorities, and private companies have upgraded and expanded port facilities for refrigerated and general cargoes.

For Latin FFV products, the U.S. market east of the Rocky Mountains is served by two port locations. Miami, FL, dominates trade from Central America, receiving containerized FFV products by water and floral products by air. At the Delaware River Ports, principally Philadelphia, PA, FFV cargoes are dominated by Chilean grapes and stone fruits. However, Mexico, via overland truck through Nogales, AZ, is the dominant source of imported FFV to the U.S. market.

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U.S. ports that receive bananas provide an alternative trade route model, since product requirements are similar. Each company in this trade uses four or five water ports, with at least one located in the Gulf of Mexico. Similar use of Gulf ports for FFV might reduce distribution cost to Central and Southern U.S. markets. Shippers also might gain through the competition provided by a more diverse set of ports.

Floral products from Colombia are most important among items sufficiently time-sensitive to require air transportation. Miami's dominant position in air-freight complements Florida's existing floral industry through sales (larger product selection) and transportation (shipping mixed product loads). Reciprocal landing rights agreements reduce competition from other airports. Free trade agreements could result in distribution savings from use of other airports.

Companies that receive FFV products base their location (and port choice) on ability to serve customer needs. Changes in the customer base can make these decisions obsolete even though companies have substantial investment in fixed facilities. Two important areas of consumer concern are product quality and price. In response, distributors seek sources that provide consistent quality at prices that are at least competitive. Technical economies in transportation also are important. For Southern and Midwestern markets, transportation cost savings appear to be obtainable from ports on the Gulf of Mexico. However, firms also need sufficient volume at a location to keep fixed costs at an acceptable level, a disincentive for use of more than one location. If a Philadelphia- or Miami-based company chose to open another facility on the Gulf, it would expect that reduced transportation costs would be more than sufficient to offset an expected increase in fixed costs.

To address the issue of changed trade flows resulting from transportation efficiencies, the domestic

handling and distribution industry for waterborne and air-freighted FFV imports from Latin countries was studied to determine the perceived need for Gulf of Mexico water ports or Southern airports as receiving points, and to assess the industry's perception of the current capability of selected ports to serve those needs. An industry survey was used to

1) elicit industry perception of the capability of selected Gulf water ports and airports as handlers of perishable cargos, and
2) identify factors limiting use of the New Orleans water port and airport as potential landing sites for these products.

Literature Review

A limited set of literature on port selection focused on differences in opinion between management and users about factors that influence port choice (Murphy, et al.). Ocean port and airport managers felt that service issues, including facilities, a record of low loss or damage, and convenient pickup and delivery times, were more important influences on choice of port than were costs. Water port users tended to place relatively more emphasis on freight rates, while airfreight users emphasized minimization of delays.

Modal choice, or the selection of a particular transportation mode between two points, has received more research emphasis and provides insight into a similar decision-making process. Generally, non-transportation cost variables and cost (rates) were about equally important to shippers, but selection was constrained by the largely qualitative, non-transportation costs (McGinnis 1979, 1989). These factors included speed, reliability, product characteristics, and service (Cunningham and Kettlewood; McGinnis 1979). Switching between modes occurred as buyers tried to optimize the price-service relationship, selecting new carriers who were most able to provide the required set of services. McGinnis (1989) noted that non-cost variables did not insulate a carrier from price competition, since some shippers were more price than service oriented.

Shipper/carrier loyalty retarded switching between modes and was influenced by acceptable levels of price and service, the desire of buyers to limit the search for alternatives, and ownership of specialized transport facilities (Cunningham and Kettlewood). Alternatives were chosen after some dissatisfaction occurred with the current modal selection, such as deterioration of service, desire to reduce overall costs or transit time, changes in markets, or if significant cost savings could result from relocation. Availability of alternatives was important because most companies preferred not to be dependent on a single carrier (Jeffs and Hills). Also, the transportation decision-maker is influenced by overall company policy decisions, marketing goals (McGinnis, 1979), and facility investment (Bardi). Decisions, of which the transportation decision is a component, are part of the industrial process.

The decision about port choice, then, appears to be similar to factors that influence the choice between transportation modes. Prices are a factor, availability of services and facilities is influential, and strategies that originate from port manager and user evaluations of the attractiveness of a particular port also are important.

Procedure

Industry perception of service availability through the Gulf of Mexico was documented through a survey of companies, selected from the 1989 Blue Book (Produce Reporter Company), that import or handle imported FFV or cut flowers. The instrument was mailed to 792 firms in areas where Gulf ports were distance-competitive with Philadelphia and Miami. At appropriate intervals, reminder postcards and follow-up questionnaires were mailed. For firms with multiple locations, a questionnaire was mailed only to the headquarters. An overall response rate of 31.8 percent was achieved. Since the FFV industry is relatively concentrated in Florida, a higher portion of responses came from that state.

Important descriptive information included whether FFV imports were expected to be an increasing, constant, or declining component of the firm's business and whether the firm has evaluated and/or tried to use alternative ports. Responses were described using two-way contingency tables. The analytical procedure focused on the role (primary, secondary, or did not use) of Gulf water ports and Southern airports in company operations. The CATMOD procedure (SAS) was used to analyze these ranked variables, using the Chi-square statistic to estimate both overall differences between survey respondents and differences within and between subgroups.

Descriptive Sample Statistics

Of the 216 responding firms, 64 percent had sales in the $1 to $25 million range, while about 15 percent had sales below $1 million and about 15 percent had sales greater than $25 million. By job title, 55 percent of the individuals who completed the questionnaire were in upper management positions. Functionally, respondents were in middle or lower management in sales (14%), purchasing (15%), sales and purchasing (16%), and other (9%). Most respondents (57%) indicated that they were not involved in the port deci-

sion (Table 1). This result was not surprising given the geographic breadth of the survey. For example, if the firm's primary business was in distribution, its activities might be perceived as only marginally relevant to the port decision. Other respondents indicated that the development of central warehouses in the current marketing corridors made the issue of port alternatives irrelevant.

Alternative ports should have the opportunity to increase FFV activity if the industry expects that the level of import activity will increase and has an active interest in shipping products through alternative gateways. Many companies were interested in increasing imports and/or were looking at alternative routes. Most indicated that their company expected its use of imported FFV to increase (47%), and an additional 27 percent stated that the level of imports would remain constant. Twenty percent responded that some portion of imported FFV was moving through alternative ports, while 14 percent indicated that use of alternative ports was being considered (though no product was actually being moved through an alternative port, there was active discussion/evaluation of whether that should be done). Some respondents were experimenting--sending trial shipments--with alternative ports to determine viability.

It was expected that the "experimenting" or "some entering" responses would be chosen if the firm expected imports to increase. This pattern was evident (Table 1). Firms that expected an increase in FFV imports, compared to the "constant" and "decreasing" categories, were a lower percentage of the group that indicated the port decision was not applicable to the firm. Overall, the level of use of alternative ports was significantly related to the planned role of produce imports in the firm. These responses suggest an increase in FFV imports and that alternative trade routes are under consideration. Thus, some alternative ports might expect to be successful in pursuit of a portion of this trade.

Results and Discussion

A. Infrastructural Adequacy of Selected Gulf State Water Ports and Airports

Water ports. Ports in five cities (Galveston, Houston, New Orleans, Gulfport, and Tampa) were examined based on size, location, and current produce activity. Each city, either currently or in the recent past, has served as a receiving point for bananas, and Galveston and Gulfport are major participants in that trade. Houston served as a receiver for Chilean product in the 1990-91 season. Three of the ports are major export sites--Tampa exports citrus, New Orleans exports frozen food products, and Houston exports a variety of temperature-sensitive products. A constraint on these ports is the absence of full-time quarantine and customs inspection agents.

Industry perception of whether the port facility in a given city had the necessary infrastructure to adequately handle fresh produce (response was yes = 1 or no = 2) was compared by the role played by Gulf of Mexico ports (Table 2). Overall, the industry perceived that infrastructures were acceptable. Tampa had the best rating (1.18), followed by Houston (1.29) and New Orleans (1.29). Only in the case of Gulfport and Galveston (when evaluated by respondents who did not use a Gulf port) did a majority of respondents indicate that a port had inadequate facilities. Tampa was given a significantly better rating than the other ports, while Galveston was rated significantly lower.

Airports. Five large southern airports, at Dallas, Houston, New Orleans, Atlanta, and Miami, were included. New Orleans, Dallas, and Houston all have passenger/cargo service to at least some points in Central America. Atlanta is one of the nation's busiest airports, and Miami's importance was discussed above.

Whether the airport served as a primary or secondary landing point, or for the combined responses across use groups (Table 3), Miami was most frequently rated as having adequate infrastructure (1.15), while New Orleans (1.44) was lowest in this rating. Miami's rating was significantly better than its potential competitors, while the other airports were perceived as about equal.

B. Ratings of Selected Transportation and Non-Transportation Cost Factors at Louisiana Water Ports and Airports

Analysis of the industry's perception of the water port and airport located at New Orleans, LA, as a FFV landing site was based on the role that Southern ports play in the firm's activity (primary port, secondary port, or do not use ports). These responses addressed a specific port, but responses can be interpreted in a regional context. As indicated above, in a statistical sense the New Orleans facilities were not ranked differently than the other non-leaders in this market and may be used to indicate the advantages and drawbacks of a (Western) U.S. gulf port.

Respondents ranked each question on a five-point scale: strongly agree (=1), agree, neutral or does not apply, disagree, or strongly disagree (=5). The "not applicable or neutral" response, used by about 36 percent of firms for all factors, was ambiguous in interpretation. These respondents were excluded from subsequent analysis, resulting in some loss of informa-

Table 1

Imported Fresh Fruits and Vegetables as a Proportion of Firm's Business by Kind of Use of Alternative Ports

FFV Imports, as a Portion of Sales, Will be	Kind of Use of Alternative Ports[1]				
	Considering Alternative Port Use	Experimenting With Alternative Port Use	Some Enters Through Alternative Ports	Not Applicable	Total
	Number of respondents				
Increasing	27	17	28	34	106
Constant	3	3	14	41	61
Decreasing	1	0	1	3	5
Not applicable	0	0	2	48	50
Total	31	20	45	126	222

[1] The relationship between role of produce and use of port was significant ($p < 0.001$, Chi-square = 67.489).
Source: 1991 Survey of Produce Distribution Firms.

Table 2

Industry Perception of the Infrastructure for Handling Imported Produce at Selected U.S. Gulf of Mexico Water Ports[1,2]

Water Port Located at	Use Level			
	Primary (n=46)	Secondary (n=40)	Do Not Use (n=52)	Total[3] (n=138)
	Mean			
Galveston, Texas	1.300	1.296	1.500	1.374 a
Houston, Texas	1.240	1.258	1.342	1.287 ab
New Orleans, Louisiana	1.348	1.310	1.256	1.294 ab
Gulfport, Mississippi	1.226	1.344	1.500	1.366 ab
Tampa, Florida	1.143	1.100	1.244	1.166 b

[1] Mean scores in the total column differed at the 0.001 level; differences between the role of port groups for a particular city, and between cities for a specific group, were not significantly different at the 0.001 level.
[2] Responses consisted of 1=yes or 2=no.
[3] Cities with a common letter did not differ ($p < 0.001$).
Source: 1991 Survey of Produce Distribution Firms.

tion and increased weight to the responses that were retained.

Water ports. In the overall analysis where means ranged from a low of 2.24 for "would provide a selling advantage in the Southern U.S." to a high of 3.29 for "cost or availability of trucking prohibits use," significant differences between factors were observed. However, neither the within group rankings of factors nor the ranking of a given factor between groups was significantly different (Table 4). As an example, within the group of firms that used Gulf ports as primary ports, the difference between the lowest mean rank (sufficient regional demand to justify a terminal market, 2.16) and the highest mean rank (cost or availability of trucking, 3.30) was statistically indistinguishable. Also, when individual factors such as "has adequate facilities and infrastructure" were compared by kind of port use, no significant differences were found. Responses from the different port use groups and the level of use groups are reported in the table, but are not discussed.

Three questions--"provides selling advantage," "sufficient demand for a terminal market," and "adequate facilities and expertise"--were stated so that a response favorable was indicated by responses below 3. Favorable responses to the other factors was indicated by a number greater than 3.

Among the four questions in the latter group, respondents agreed that "lack of direct liner service" influenced port use, while "cost of transit" and "cost or availability of trucking" did not constrain use. "Domestic trucking cost" was not different from "overall transit cost" or "absence of secondary markets restricts use," but was higher than any of the other factors.

The factor "provides a selling advantage" appeared to be the most important advantage of the port, though specific advantages were not specified. Two additional factors--"adequate facilities and expertise" and "sufficient demand for regional market"--were areas where the port was favorably positioned. Overall, these 3 factors were significantly different from the factors discussed in the previous paragraph.

Airports. The methodology used to evaluate airports was identical to that used to evaluate perceptions of water ports. Again, mean rankings differed only in the overall analysis (Table 5). Comparing means between airport user groups revealed a range from a low of 2.26 for "provide a selling advantage" to 3.28 for "cost or availability of trucking prohibits use." The factors "adequate facilities and expertise" and "absence of secondary markets" were neutrally ranked. The most limiting factor was "is not a major airline hub" (2.71). The most favorably ranked factor "provides a selling advantage" was significantly different from all other factors except "sufficient demand." Ranks of the other factors were fairly similar.

Summary and Conclusions

Most of these food distribution and/or handling firms believed that volume of imported FFV would be increasing, were aware that alternative points of entry could be beneficial, and had a desire to develop these alternatives. Firms that planned a more important role for imported FFV were those firms actively using Southern ports. More respondents felt that the Florida (Miami and Tampa) ports had the necessary infrastructure to serve as FFV entry points. Alternative ports were less positively viewed.

Generally, respondents perceived that a selling advantage could result from arrival of Latin American FFV in New Orleans or other central ports, and that trucking cost would not be a barrier. Some constraints were identified, including limited size of and demand in secondary markets and the need for a regional terminal market/transshipment center in the area. A common thread for both airports and water ports was an inadequate link to the international transportation system--direct steamship service, international flights, or hub availability.

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Table 3
Industry Perception of Adequacy of Infrastructure
at Selected Southern U.S. Airports to Handle Imported Produce[1,2]

Airport Located at	Use Level: Primary (n=36)	Secondary (n=36)	Do Not Use (n=53)	Total[3] (n=125)
	Mean ranking			
Dallas, Texas	1.533	1.250	1.378	1.375 a
Houston, Texas	1.421	1.200	1.381	1.346 a
New Orleans, Louisiana	1.556	1.381	1.419	1.439 a
Atlanta, Georgia	1.444	1.222	1.311	1.311 a
Miami, Florida	1.118	1.094	1.213	1.150 b

[1] Mean scores in the total column differed ($p < 0.001$ level); differences between the role of port groups for a particular city, or between cities for a specific group, were not significant ($p < 0.001$).
[2] Responses consisted of 1=yes or 2=no.
[3] Cities with a common letter did not differ ($p < 0.001$).
Source: 1991 Survey of Produce Distribution Firms

Table 4
Industry and Food Distribution System Perception of Factors
that Limit or Enhance Opportunity for Imported Produce Trade at the New Orleans Water Port[1]

Factors That Influence Use of New Orleans Water Port	Use Level: Primary (n=25)	Secondary (n=34)	Do Not Use (n=35)	Overall[2] (n=97)
	Mean rank			
Has adequate facilities and expertise	2.643	2.500	2.324	2.478 a
Lack of direct ocean liner service limits use	2.464	2.935	2.853	2.763 ab
Cost of transit over this route prohibits use	3.000	3.219	3.286	3.179 bc
Cost or availability of trucking prohibits use	3.296	3.194	3.371	3.290 cd
Absence of secondary markets restricts use	3.148	2.968	2.971	3.022 bd
Has sufficient demand to justify regional terminal market	2.160	2.586	2.617	2.477 a
Use would provide a selling advantage in the southern United States	2.320	2.222	2.182	2.236 a

1 Overall means differed significantly ($p < 0.001$); differences between the kind of water port use groups for a particular factor, or between specific factors within a particular port group, were not significant.
[2] Factors with a common letter did not differ ($p < 0.001$).
Source: 1991 Survey of Produce Distribution Firms.

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Table 5

Industry and Food Distribution System Perception of Factors
that Limit or Enhance Opportunity for Imported Produce Trade at the New Orleans Airport[1]

Factors That Influence Use of the New Orleans Airport	Use Level			
	Primary (n=21)	Secondary (n=28)	Do Not Use (n=50)	Overall[2] (n=96)
	Mean rank			
Has adequate facilities and expertise	2.950	3.167	2.808	2.934 ab
Is not a major airline hub	2.429	2.458	2.958	2.710 bc
Cost of transit over this route prohibits use	2.857	3.000	3.408	3.181 bd
Cost or availability of trucking prohibits use	2.895	3.000	3.571	3.283 ade
Absence of secondary markets restricts use	2.895	2.750	3.204	3.022 bef
Has sufficient demand to justify regional terminal market	2.500	2.522	2.435	2.471 cfg
Use would provide a selling advantage in the Southern United States	2.684	2.304	2.065	2.261 g

[1] Overall means differed significantly ($p < 0.001$). Differences between the kind of airport usage group for a particular factor, or between specific factors within a particular port group, were not significant.
[2] Factors within a specific column that have a common letter are not significantly different at the 0.001 level.
Source: 1991 Survey of Produce Distribution Firms.