

Global Market Segments For Value-Added Agricultural Products

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Although the United States exports large volumes of agricultural commodities, there is much faster growth in the trade of value-added products. As markets for traditional agricultural commodity exports mature and world consumption and trade of value-added agricultural products increase, considerable interest in identifying growth markets for value-added agricultural products has developed. Many countries (Canada, Australia, the U.S., and the EC) have expanded exports of value-added agricultural products through a combination of public and private strategies.

Most research on prospects for agricultural trade in value-added products has relied on using past growth to predict future growth. The Foreign Agricultural Service (FAS), for example, estimates the best growth markets for total U.S. agricultural exports to individual countries based on eight trade and macroeconomic variables, such as past growth in total agricultural imports to that country, past growth in total agricultural imports from the U.S., and projected income growth and population change.

Comparisons across countries, rather than for individual countries over time, may be of greater value in marketing decisions. The FAS approach may, for example, understate the potential of a future customer if it is not currently a customer. Also, we often view a potential importing country along a narrow band of variables such as income, population growth, and current imports. While these may have been sufficient for analyzing

growth in commodity trade, they are not sufficient for analyzing potential value-added trade.

This research identifies global market segments for value-added agricultural products. Market segments are defined as groups of consumers who are expected to have similar purchasing responses. Market segment identification is an essential component of international market development, particularly for value-added agricultural products. Segment identification can assist in selecting markets to target, an effort that enhances the probability of success. A first step in identifying global market segments is to group the global market into countries with similar characteristics.

This research follows earlier work in grouping countries based on economic and trade variables such as gross domestic product, exports, imports, etc. However, this research also includes variables that affect total and value-added food consumption, such as calorie and protein consumption, age distribution, media availability, and female labor force participation (Table 1). A combination of factor and cluster analysis allows the grouping countries based on a large number of variables.¹

¹ Factor analysis first combines the variables that are correlated into factors, thus resulting in a more manageable data set. Impacts of redundant or non-contributing variables are lessened. The countries are then given an average score on each of the factors and then grouped, in a cluster analysis, according to their similarities on the factor scores. The cluster analysis groups the countries by minimizing the within group differences and maximizing the between group differences.

The data set included 119 countries. These countries have a combined population of 3.3 billion (1989 estimate) or approximately 66 percent of the world's estimated population of 5 billion. Data on other countries were not sufficient for their inclusion. Among those countries excluded were the former Soviet Union, several Asian countries (Afghanistan, Cambodia, Mongolia, and Vietnam) and most Caribbean and Pacific island nations. Results for 10 segments are reported and discussed.

Segment Results

Segment 1, with 36 members, and Segment 2, with 17 members, contain the world's poorest countries. These segments contain most African nations and several of the poorer Asian and Latin American countries. The average gross domestic product per capita (GDPCAP) is only \$825 for Segment 1 and \$370 for Segment 2. Calorie and protein consumption, along with energy consumption and media availability, are lower than for any segment while fertility rates, population growth rates, and percentage of the population age 14 or younger are among the highest of any segment. These two segments combined have a total population of 1.7 billion, 52 percent of this sample.

The world's richest countries are in Segments 3 and 4. Segment 4 contains the eight wealthiest nations, including the U.S., Canada, the Nordic countries, Japan, and Switzerland, with an average GDPCAP of \$22,418 and a total population of 423 million. Every country in this segment has a GDPCAP in excess of \$20,000. As expected, these segments have the highest calorie and protein consumption, the largest media availability and among the lowest fertility and population growth rates.

Segment 3 has 15 members, including 11 of the EC-12, Malta, Australia, New Zealand, and Uruguay, with a total population of 363 million. These countries have an average GDPCAP of \$12,839, although the range is greater than for other segments, including

Uruguay on the low end at \$2,540 and Denmark on the high end at \$20,685. Considering only GDPCAP, Uruguay does not appear to fit this group. However, it shares more common characteristics with this more developed group than with less developed countries of a similar income level. For example, while the average GDPCAP of Segments 5 and 6 are \$2,701 and \$2,772, respectively, their population distributions are much younger with 39 percent and 32 percent age 14 or younger, respectively, compared to Uruguay's 25 percent. Segments 5 and 6 also have more rapid population growth rates and lower life expectancies than Uruguay.

Segments 5 and 6 make an interesting comparison. Segment 5, with 15 members, contains eight Latin American countries, including Brazil, Chile, Columbia, Ecuador, Paraguay, and Venezuela, and seven African and Middle Eastern countries, including Algeria, Egypt, Israel, Jordan, and Saudi Arabia. Segment 6, with 14 members is more regionally diverse, containing the Eastern European countries of Czechoslovakia, Hungary, and Romania; the Asian countries of Korea, Malaysia, and Thailand; along with three Latin American countries (Barbados, Guyana, and Jamaica); three African countries (Botswana, Lesotho, and Swaziland); Cyprus; and Portugal.

Although their average GDPCAPs are nearly equal at \$2,701 and \$2,772, Segments 5 and 6 are very different in other ways. Segment 6 has imports as a percent of gross domestic product (GDP) that are more than twice that of Segment 5 (56 percent vs. 22 percent) and an export percent that is nearly double (40 percent vs. 25 percent). International reserves per capita in Segment 6 are also double those in Segment 5. Segment 6 has higher calorie and protein consumptions, higher life expectancy, lower fertility rates, lower population growth rates, and a smaller percentage of the population age 14 or younger than Segment 5. Segment 6 has a higher female labor force participation rate of 36 percent compared

Table 1. Description of Variables

Variable	Description
Gross domestic product per capita	in U.S. dollars
Money supply	in U.S. dollars per capita
Female labor force participation rate	
Calories per day	per capita
Protein	in kg per capita per day
Energy consumption per capita	per annum in kg of oil equivalent
Televisions	per 1000 people
Radios	per 1000 people
Percent urbanization	
Annual growth rate of urban population	
Years of life expectancy at birth	
Fertility measured as births per woman	
Annual growth rate of population	
Percent of population 0 to 14 years old	
Population per square kilometer	
International reserves	in U.S. dollars per capita
Exports	in U.S. dollars, fob, expressed as a percent of GDP
Imports	in U.S. dollars, cif, expressed as a percent of GDP
Gross domestic savings	expressed as a percent of GDP
Gross domestic investment	expressed as a percent of GDP
Net foreign investment	expressed as a percent of GDP
Percent of land in agriculture	
Annual rate of inflation	

Note: The latest year that a complete data set existed, 1989, was used. All monetary values are expressed in U.S. dollars. Variables are converted to per capita terms or percents where necessary to provide equivalent measures among countries. Exports, imports, savings, and investment are expressed as a percent of gross domestic product.

to 15 percent for Segment 5. Segments 5 and 6 have populations of 381 million and 183 million, respectively.

Eight countries including China, Indonesia, Mexico, Poland, and Turkey, with a total population of 1.5 billion, are in Segment 7.² The relatively low standard of living is reflected in a GDPCAP of \$1,767. This segment is also characterized by a large degree of net foreign investment (-55 percent), a large percentage of land in agriculture (45 percent), low export and import percentages (19 percent and 16 percent, respectively), large values of gross domestic savings and gross domestic investment, and a high inflation rate of 202 percent.

Three Middle Eastern countries, Oman, Kuwait, and the United Arab Republic, with a combined population of 5.1 million, comprise Segment 8. This segment has a moderately high value for the factor representing standard of living, reflecting a GDPCAP of \$11,673. This segment has a very high fertility rate of 5.1 percent; this fertility rate is exceeded only by Segments 1 and 2, the poorest segments. This segment has the second highest exports, as a percent of GDP, and international reserves, second only to Singapore. The participation of females in the labor force, at only 9.1 percent, is the lowest of any segment.

Segment 9, comprised of two members, Argentina and Peru, is distinguished by its average inflation rate of 3,239 percent. This segment is also characterized by the low percentage of exports and imports, the low level of international reserves, high percentage of land in agriculture, high level of net foreign investment, and low levels of gross domestic savings and gross domestic investment. The total population in the segment is 53.1 million.

Singapore is the only country in Segment 10. Singapore, with a population of 3 million, is unique with a moderately high GDPCAP of \$9,768, the highest population density, and 100 percent urbanization. Most notable, though, is that Singapore has exports and imports as a percent of GDP greater than 100 percent and the highest levels of international reserves, reflecting Singapore's role as an trade center for Asia.

Summary

Segmenting the global market for value-added agricultural products is a necessary first step in targeting markets for future trade. Segments 1 and 2, with the world's poorest countries, are dominated by their low standard of living and are unlikely candidates for considerable growth in consumption of value-added products in the near future. However, these markets may be candidates for commodities or intermediate processed goods. Also, even within these poorer segments, there are pockets of relatively better off consumers able to purchase value-added products, although logistically they may be more difficult to reach.

Segments 3 and 4, with the world's 23 richest countries, Segment 8, with Kuwait, Oman, and the United Arab Emirates, and Segment 10, Singapore, are excellent candidates for current and future consumption of value-added products. In fact, within these segments there is intense competition for the value-added market. Issues of primary concern in these segments are product development, logistics, policy, and tariff and non tariff barriers.

The nations of the most interest for potential future consumption of value-added agricultural goods are in Segments 5, 6, and 7. Of these three segments, the 14 members of Segment 6 (Korea, Malaysia, Thailand, and Portugal, among others) are better positioned to enter into trade in value-added agricultural products in the near future. Segment 5, with 15 members, including eight Latin American

members and six Middle Eastern and North African members, has an income nearly equal to Segment 6. However, Segment 6 has higher export and import percents, higher levels of international reserves, higher calorie and protein consumptions, and a higher female labor force participation rate. Segment 7 with eight members (Mexico, China, and Indonesia, among others) has few indicators of rapid consumption growth in the near future, but it does have indicators of becoming a consumer of value-added goods in the longer run. These indicators include the high level of net foreign investment along with relatively high levels of gross domestic savings and investment.

Identifying segments of the global market is a necessary first step for successful international marketing. Development of a successful marketing strategy requires many additional considerations, including product formulation, global competition, choice of entry mode, logistics, and tariff and non tariff barriers. Knowledge of market segments can aid in developing market strategies for different segments. Countries with little potential for growth in value-added product consumption can be targeted with commodities or intermediate value goods. Countries that have the greatest potential for future growth in consumption of value-added trade can be targeted for further market analysis.

References

- Foreign Agricultural Service. (1991, January). "Star Gazing: Markets with the Brightest Potential." *AgExporter*, pp. 4-9. Washington, D.C.: U.S. Department of Agriculture.
- Krause, Joyce Hall, William W. Wilson, and Frank J. Dooley. "Global Market Segmentation for Value-added Agricultural Products." *Agricultural Economics Report No. 315*, Department of Agricultural Economics, North Dakota State University, Fargo, February, 1994.

² Using data for 1989, the former Yugoslavia would have been grouped with this cluster. However, as is the case with all countries in the cluster analysis, significant changes in the variables used to create the factors and the clusters may change the cluster memberships.

Table 2. Global market segments.

Segments									
One	Two	Three	Four	Five	Six	Seven	Eight	Nine	Ten
Bangladesh	Benin	Australia	Canada	Algeria	Barbados	China	Kuwait	Argentina	Singapore
Bolivia	Burundi	Austria	Finland	Brazil	Botswana	Gabon	Oman	Peru	
Cameroon	Cape Verde	Belgium-	Iceland	Chile	Cyprus	Indonesia	United Arab		
Chad	Central African	Luxembourg	Japan	Columbia	Czecho-	Madagascar	Emirates		
Comoros	Republic	Denmark	Norway	Congo	slovakia	Mexico			
Costa Rica	Gambia	France	Sweden	Ecuador	Guyana	Poland			
Dominican Rep.	Kenya	Germany	Switzerland	Egypt	Hungary	Turkey			
El Salvador	Laos	Greece	USA	Iran	Jamaica	Yugoslavia			
Ethiopia	Malawi	Ireland		Israel	Korea				
Fiji	Nepal	Italy		Jordan	Lesotho				
Ghana	Niger	Malta		Paraguay	Malaysia				
Guatemala	Papua New	Netherlands		Saudi Arabia	Portugal				
Haiti	Guinea	New Zealand		Suriname	Romania				
Honduras	Rwanda	Spain		Trinidad and	Swaziland				
India	Somalia	United Kingdom		Tobago	Thailand				
Ivory Coast	Tanzania	Uruguay		Venezuela					
Mali	Togo								
Mauritania	Burkina								
Morocco	Vanuatu								
Nigeria									
Pakistan									
Panama									
Philippines									
Senegal									
Seychelles									
Sierra Leone									
South Africa									
Sri Lanka									
Sudan									
Syria									
Tunisia									
Uganda									
Yemen									
Zaire									
Zambia									
Zimbabwe									