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The Economics of World Wheat Markets: Implications for North America

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Grain Quality and Hard Wheats Exported from North America

William W. Wilson and Bruce L. Dahl

Previous debates about competition and demand for wheat have focused on class and country of origin as the salient sources of differentiation. This study analyzes changes in demand for both wheat classes and grades. Comparisons are made across Canadian and U.S. hard wheats. In addition, quality characteristics of U.S. hard wheat exports are examined using cluster analysis to identify purchasing behavior with respect to composition of grade and nongrade parameters (dockage, test weight, protein, total damage) and to identify market segments.

...demand for classes of wheat has changed in the last decade, with an increase in demand for Hard Red Spring and a decrease for Hard Red Winter.

The United States and Canada are the principal competitors in the hard wheat market. Both countries are the dominant producers of Hard Red Spring Wheat (HRS in the United States and Canadian Western Red Spring [CWRS] in Canada) The United States is the dominant producer of Hard Red Winter Wheat (HRW). Both countries are large producers of durum (Hard Amber Durum [HAD] in the United States and Canadian Western Amber Durum [CWAD] in Canada). Due to the indigenous similarities among these wheats, the competitive environment between these two countries is particularly acute.

Exports of U.S. and Canadian wheats by class were compared using shift-share analysis from 1980–1983 to 1990–1993. U.S. HRS, CWRS, and CWAD were the fastest growing classes of wheat exports from 1980–1983 to 1990–1993. Exports of U.S. HRW incurred the greatest loss of market share. Canadian “other wheat” was the second fastest growing class behind U.S. HRS, but that growth appeared to be due to a one-year jump in Canadian feed wheat exports rather than a long-term trend.

Exports of U.S. and Canadian hard wheat classes were examined by grade from 1986–1987 to 1993–1994 (HAD, HRS, HRW) and 1986–1987 to 1990–1991 (CWAD, CWRS) using shift-share analysis. There were shifts away from exports of lower grades of wheat toward No. 1 exports for all classes of Canadian and U.S. wheat.

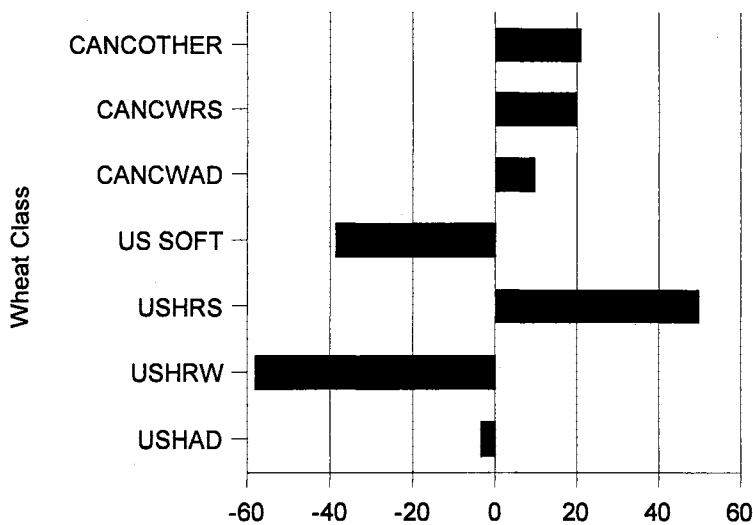
What percentage of No.1 HRS and CWRS were exported to countries identified as importers of high-quality wheat? The U.S. exported nearly all of its No. 1 HRS to high-quality importers between 1986 and 1994, but No. 1 HRS was just 20 percent of *total* HRS exports to those importers. In contrast, over a comparable period, Canada exported less than 30 percent of its overall No. 1 CWRS to high quality importers.

Characteristics of exports of U.S. HRS wheats were examined using cluster analysis to identify and examine the composition of importers buying similar wheats. Clusters were identified based on selected grade and nongrade determining factors (dockage, test weight, protein, total damage). Comparisons were made to see if the number and composition of clusters had changed over time. Cluster analysis was conducted by wheat class for U.S. HAD, HRS, and HRW from 1986 to 1994. A discussion of the results from this analysis follows.

First, over the entire period, each hard wheat class had several distinct market segments. HAD had three segments and HRS and HRW each had four segments. Second, there were notable changes in the definition and composition of segments over the time period of the study. The number of segments existing in HAD exports increased from three to four, HRS increased from two to five segments, and HRW increased from two to four segments. Third, countries included in what could be defined as the higher-quality segments varied, and in some cases, they jumped in and out of a segment. Those countries that were in the higher-quality HAD segment more than 50 percent of the time in recent years were Italy, Costa Rica, Japan, and Kuwait. Those in the higher-quality HRS segment at least 50 percent of the time were Taiwan, South Korea, Malaysia, New Zealand, and Singapore. Those in the higher-quality HRW segment at least 50 percent of the time included Japan, South Korea, Taiwan, Thailand, Bangladesh, Hong Kong, Malaysia, and Norway. Other countries were also categorized as being part of these segments but were there only periodically.

Implications can be discerned from these results that are important for both the public and private sectors. First, as shown in Figure 12, it is notable that

Figure 12. Percent Net Shift in Exports, by Class, 1980-83 to 1990-93



the fastest growth market has been HRS, whereas HRW has fallen sharply, suggesting a significant shift in the composition of demand over the past decade. Second, these results likely have important market development implications. Several economists have suggested that past efforts to encourage buyers to specify tighter quality specifications appear to be having some effect. However, the notable shift away from lower grades to higher grades would suggest that market development strategies for lower grades should be reevaluated.

Implications for the private sector can also be identified. First, the shift in U.S. exports toward greater specificity and generally toward higher-quality wheats has implications for the domestic processing sector. Traditionally, the processing sector dominated the consumption of higher-quality hard wheats, leaving the remainder for the export market. The shifts identified in this analysis suggest that in the future, the domestic market will have a weaker claim over the higher-quality wheat supply, with the result that quality premiums may increase. A second implication relates to the apparent increase in differentiation and number of segments in the international wheat market. This should be viewed positively by traders and others in the supply chain as it allows them to compete in some segments that are more highly differentiated. However, to do so may very well require the ability to create segregations that are maintained throughout the supply chain through use of either increasingly more sophisticated premium/discount schedules and/or through other vertical coordination mechanisms.

About the Authors

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