IMPACTS OF SAVANNAH PORT AND PANAMA CANAL EXPANSIONS ON THE SOUTHEASTERN COTTON INDUSTRY

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Abstract

The US is the world's third largest cotton producer and the world's largest cotton exporter. US cotton production is concentrated in the Southern Plains, the Southeast, the Delta, and the West. Texas produces one third of all US cotton, followed by George with twenty-percent. Of the upland cotton produced, most is in the Southeast/Southwest. Transportation is one of the major factors that affect the competitive position of US cotton, allowing for the delivery of cotton to international markets in a timely and cost effective manner. Improvements in the US transportation network ultimately influence cotton mill use, cotton exports, shipping patterns, and world trade through the Atlantic ports as the Panama Canal expansion accommodates larger container ships. Consequently, deepening or dredging the Southeastern ports of Savannah and Charleston is needed to allow for deeper and wider draft container ships. The completion of these expansions has major implications for altered shipping patterns for cotton throughout the US and Southeast, including total cotton exports to rise approximately five-percent, reduction in ocean freight rates, regional shifts in trade and market share, and prices and produce revenues will experience regional shifts, favoring cotton producers in the Southeastern states at the expense of the West Coast.

Introduction

The United States is the world's third largest cotton producer (behind #1 China and #2 India) and the world's largest cotton exporter, supplying 11-percent of the global cotton production in 2015 and accounting for 35-perecent of the world export market [Meyer and MacDonald, 2015]. United States cotton production is concentrated in the Southern Plains, the Southeast, the Delta, and the Western regions of the US, with Texas producing one-third of all US cotton, followed by Georgia supplying one-fifth of US cotton production in 2015. Of the upland cotton produced in the US, 37-percent is in the Southeast (Alabama, Florida, Georgia, North Carolina, South Carolina, and Virginia), 36-percent in the Southwest (Kansas, Oklahoma, and Texas), 20-percent in the Delta (Arkansas, Louisiana, Mississippi, Missouri, and Tennessee), and seven-percent in the West (Arizona, California, and New Mexico). The top four cotton spinning countries are China, India, Pakistan, and Turkey; however, the five principal export markets for the 2012/2013 US cotton are Honduras, Mexico, Dominican Republic, Canada, and China, respectively.

In the last two decades, the US cotton sector has faced a number of challenges as the domestic mill demand has declined and US exports have increased. During the 1990s, domestic mill demand accounted for about 50-percent of available cotton supplies. Due to the decrease in domestic textile production caused by competition from imported textile and apparel products, US mill use dropped to 30-percent for 2000-2005, and has averaged less than 20-percent annually since then. The resulting cotton surplus forced the domestic industry to look for alternative markets. Significant changes in the global market for cotton and cotton-based products, particularly an increase in the global export demand, have provided overseas markets for US cotton. The emergence of China as the world's largest raw cotton importer has resulted in a strong, yet somewhat variable market for US cotton, especially as China has emerged as the world's largest cotton producer as well. China's imports, however, are forecast to decline for the fourth consecutive season in 2015/2016, providing varying expectations for the leading cotton shippers [Meyer and MacDonald, 2015].

The latest USDA estimates for 2015/2016 cotton project world cotton mill use at 111 million bales. Low polyester prices relative to cotton, and issues associated with China's transition to new cotton policies and adjustments to higher wages, plus a very slow growth forecast for global income growth, are factors limiting cotton consumption growth.

Because the US cotton industry is highly dependent on foreign markets, it is important for the industry to keep US cotton competitive with other foreign suppliers, such as India and Pakistan. Transportation is one of the major factors that affect the competitive position of US cotton, allowing for the delivery of cotton to international markets in a timely and cost effective manner. The increase in US cotton exports has clearly resulted in a shift in trade patterns and logistical requirements. In particular, increasing cotton demand in China and other Asian countries has increased cotton shipments to already congested US west coast ports. This problem was exacerbated during 2009 as Atlantic and Gulf ports became increasingly inaccessible for containerized cotton exports. Outgoing grain and oilseed exports

required a greater number of containers and berths at ports. Delta and Southeast cotton shipments to China were increasingly shipped via the West Coast instead of Savannah, which resulted for the first time in a declining futures market basis for Delta/Southeast cotton relative to Texas cotton. While port congestion has eased since that time due to the global economic downturn, adequate transportation infrastructure that guarantees cotton shipments in a timely, efficient manner will provide a greater level of competiveness for US cotton exports in the future.

Objectives and Methodology

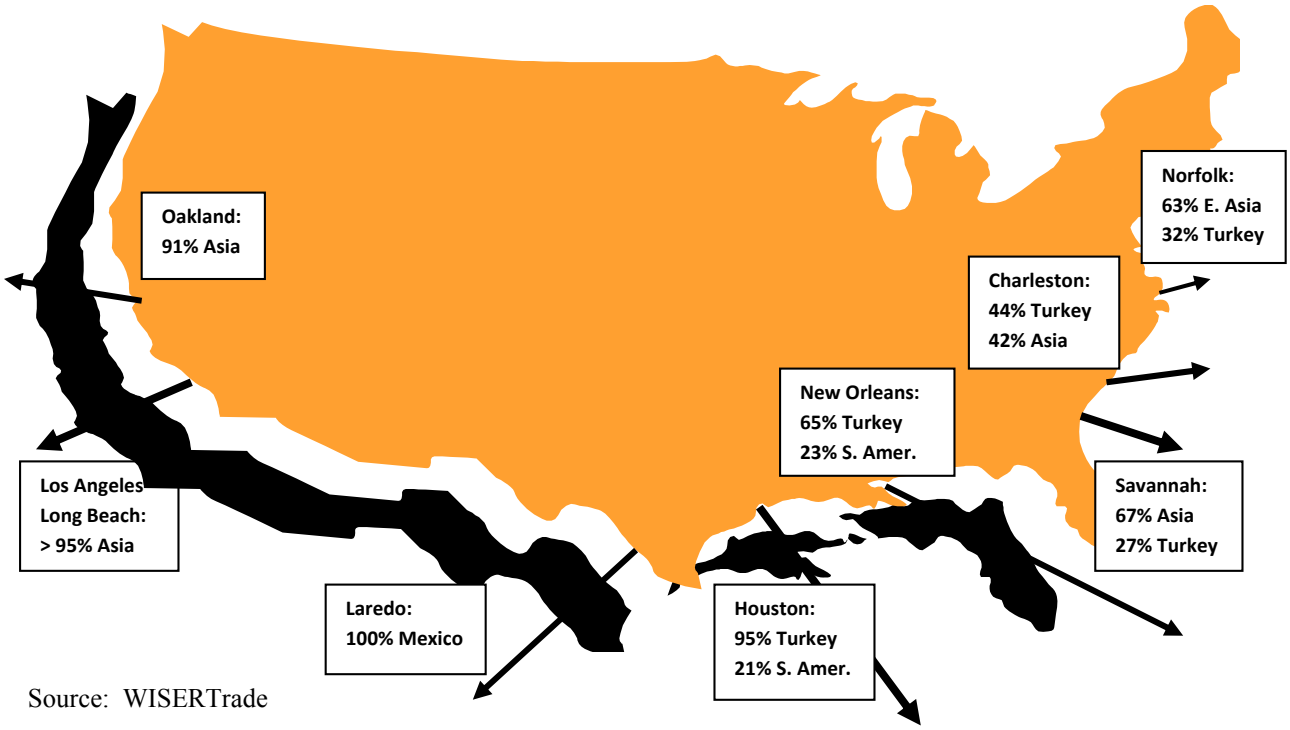
The US export transportation infrastructure serving the cotton industry will be evaluated to assess the impacts on cotton shipping patterns in the US (and globally) resulting from the improvements and expansion of the Panama Canal. Many of the logistical and infrastructure issues affecting the cotton industry in recent years have related to major cotton producing states, especially in regard to accumulating cotton for shipment to the Texas-Mexico border, the Gulf ports, the Atlantic Coast ports, and the Western US ports. Inefficiencies with this process reflect major importance to the overall competitiveness of the US cotton industry [Rosson et al, 2011].

The analysis uses the results of a cost minimizing spatial mathematical programming model, which sources cotton from actual gin points, and then routes flows to nearby warehouses for storing or shipping to intermediate(intermodal facilities) or domestic destinations (US ports of exit) for container vessel shipping. The international portion of the model connects excess supply regions with excess demand regions and ports via truck and rail and ship.

Background Information

Global container fleet capacity is forecast to increase to 17 million twenty-foot equivalent units (TEU) in 2013, placing additional demand on US ports and the transportation system infrastructure [Salin, 2010]. The demand for containers for the export of agricultural commodities more than doubled from 2003 to 804,000 TEU in 2008. While this represents a relatively small share of total containers available for US cargo, much of the increased demand occurred at the ports of Savannah and Norfolk. Part of the reason for this was the significant increase in freight rates for bulk cargo during this time period. The situation resulted in a shortage of containers on the East Coast and led to the increased shipments of cotton to the West Coast by rail or truck for export. Although congestion and container shortages were mitigated somewhat by the recent economic recession, global cargo shipments have recovered and are expected to again strain the US port system. As a result, several states are funding dredging or deepening/widening of the docks, rivers and intercoastal waterways to gain access for the bigger container ships that will traverse the improved and expanded Panama Canal. Warehouse expansion is also occurring in Savannah (Georgia), Brunswick (Georgia), Charleston (South Carolina), Norfolk (Virginia), and Jacksonville (Florida).

Trends in US cotton exports, especially among the Gulf and Atlantic ports, have experienced changes in destinations during the past decade. A more pronounced view appears when examining concentration by market regions. The top three market regions for cotton exports through Houston were Turkey, South America, and Pakistan/India, and these regions accounted for about 90-percent of cotton exports through Houston during 2009/2010. For New Orleans, this concentration increased to 87-percent in 2009/2010, up about 35-percent from 2003/2004. Only Savannah has maintained a relatively stable concentration for top market regions at 81-percent for the time period 2003/2004 to 2009/2010 (Figure 1).



Source: WISERTrade

Figure 1. Cotton Export Destinations and Sources

In looking at the export markets by US ports, Savannah has enjoyed prominence as a point of departure for Southeastern US cotton bound for China. Other major ports accounting for cotton exports to China include Los Angeles-Long Beach, Oakland, and Houston. Houston has been and remains the leading port for exporting cotton to Turkey, followed by Savannah and New Orleans.

The large majority of cotton exports to Mexico cross at land ports of entry on the Texas-Mexico border – Laredo, Hidalgo, and Brownsville. Whether cotton is produced in Mexico in the leading producing states of Chihuahua, Baja California, and Coahuila or imported from the US, the destinations in Mexico are the mills in the states of Mexico, Hidalgo, and Morelos, all near Mexico City. Bottlenecks both politically and logistically occur at the inland borders, regardless if shipped by rail or truck, in part due to a fully implemented North America Free Trade Agreement (NAFTA). A possible solution would be to skip the land borders and ship to the port of Veracruz, Mexico from the Gulf and Atlantic Coast ports.

Other major markets include the Southeast Asian countries of Indonesia, Vietnam, and Thailand. Los Angeles-Long Beach is the largest port involved in shipping cotton to the Southeast Asian region, while Savannah is second. US cotton exports to Pakistan are also important, but somewhat erratic. Los Angeles-Long Beach is the main port involved in exporting to Pakistan, with the Savannah, Charleston, Houston, and Oakland ports sharing the second spot at least once in the last five years.

Of particular interest to ports in the Southeast are the Latin American markets (other than Mexico, discussed previously), which includes all countries in Central America, South America, and the Caribbean, especially after the implementation of CAFTA (the Central America Free Trade Agreement). Houston and Freeport are the leading cotton export sites to Latin America, followed by Savannah and New Orleans.

Results: The Baseline And The Panama Canal Expansion

A baseline model indicates the West Coast port complex of Los Angeles/Long Beach is the dominant port for cotton bale exports. Savannah is the second most important port, followed by Houston and Laredo. New Orleans was the fifth most important port, with the remaining ports of Norfolk and Mobile handling only minor export shipments of cotton.

In drawing comparisons of the baseline model results with results for the Panama Canal expansion, two scenarios were analyzed. The first is a reduction by ten-percent in ocean freight rates a result of the Panama Canal expansion for vessels originating from the US Gulf and South Atlantic ports to Asian and Pacific Rim countries. The second scenario analyzes a 25-percent reduction in ocean freight rates for the same origins and destinations.

Decreasing the ocean freight rate from US Gulf and Atlantic ports (Savannah, Norfolk, New Orleans, Houston, Charleston, Gulfport, and Mobile) to Asian and Pacific importing countries (China, Indonesia, Thailand, Bangladesh, Pakistan, Hong Kong, Japan, South Korea, and Taiwan) due to the Panama Canal expansion is expected to increase cotton exports (total volume and market share) via the Panama Canal, while the Pacific Coast ports are expected to experience a reduction in exports. A ten-percent reduction in ocean freight rates for the routes that travel via the Panama Canal is estimated to increase US cotton exports via the Gulf and Atlantic ports, except Gulfport and Mobile. The absolute change in exports is the largest for the port of Savannah, followed by the port of Houston. Furthermore, the share of US cotton exports through the Panama Canal increases by 20-percent after the expansion.

As expected, cotton flow patterns resulting from the analysis of a 25-percent ocean freight rate reduction are similar to the ten-percent reduction scenario in direction, but larger in magnitude. The ports of Savannah and Houston increased exports by nearly 100-percent and 65-percent, respectively, over the baseline model results. Houston becomes the nation's second largest cotton exporter, and the ports of New Orleans, Charleston, and Norfolk more than double their exports. Such increases in exports via the Gulf and Atlantic ports indicate that the Panama Canal expansion would increase the canal's share in total US cotton exports, more than doubling the baseline model share.

Although cotton flows are altered with lower ocean freight rates for the Atlantic and Gulf ports, total US cotton exports are only modestly impacted. For the 10-percent freight rate reduction scenario, total US cotton exports rose less than one-percent. The 25-percent reduction in ocean freight rates also increases total US cotton exports, albeit still a modest increase of about two-percent.

As the Panama Canal expansion occurs, there would be the anticipated reduction in ocean freight rates which corresponds to a decrease in transportation costs linking the US producers (at the warehouse level) to importers. The 10-percent freight rate reduction increases price and production in most of the US regions that ship via the Panama Canal, except Oklahoma and California and Arizona. Prices decrease modestly for these states since exports are diverted to Asian and Pacific importing countries via the West Coast ports. Recalling that revenues equal price multiplied by quantity, some states like Texas realize the largest gain in revenues, but not due to price increases but rather due to expansion of cotton production. Georgia has significant gains in producer revenues as well. The gain in Georgia is relevant since the port of Savannah is in Georgia and local cotton producers are the beneficiaries of both the ports of Savannah and Brunswick expansion and the Panama Canal expansion.

The 20-percent reduction in ocean freight rates from Gulf and Atlantic ports to Asian and Pacific markets is estimated to increase annual producer revenues for all cotton producing states, except California and Arizona. With respect to prices, cotton producers in South Carolina and Virginia are the greatest beneficiaries of higher prices attributed to the Panama Canal expansion, but because production in these two states is relatively small compared to the other cotton exporting states, producer revenues were less than when compared to Texas and Georgia, for instance.

Results: Savannah Port Expansion as an addendum to the Panama Canal Expansion

The prior discussion and results focused only on the Panama Canal expansion, assuming status quo for the Savannah Port, with its limited cocking capacity (depth of the channel and the linear dockage and crane infrastructure). The Savannah Port cannot handle the larger container ships entering and docking at the port facilities, especially those ships that will now be able to traverse the Panama Canal. These ships will become the standard bearer for the trade fleet.

Fishy-back (containers on ships) shipping is the most economical mode (ton-miles per fuel dollar) and the reduction in the diesel fuel prices experienced during the past few years have added impetus for trade using container ships. The spatial equilibrium modeling assumed the higher fuel costs experienced in 2009-2011. Concern and discussion about expanding the Savannah Port capacity and facilities faced additional questions beside the effect on the Georgia or Southeastern cotton industry. Are there other Georgia agribusinesses that could benefit from the proposed expansion, thereby adding heft to the legislative and funding process? Several agribusinesses surfaced as potential winners –

AGCO and John Deere (farm equipment and machinery manufacturers), Caterpillar (farm and heavy construction equipment), various pick-up truck assembly facilities, and bulk agricultural commodities such as cotton, peanuts, and livestock feed.

Using sensitivity analysis, even a five-percent freight rate reduction increases price and production in most US cotton producing regions shipping via the Panama Canal. The model suggests producer prices could decrease modestly for other regions shipping to Asia via the West Coast ports. Texas realizes the largest gains in revenue due to production expansion (not price increases), recalling that revenue equals price multiplied by quantity (production). Georgia and the other Southeastern cotton producing states should experience significant gains in producer revenues as well, resulting from the efficiencies realized with the Savannah port expansion.

Completion of both the Panama Canal and Savannah Port expansions has major implications for altering shipping patterns throughout the cotton belt for cotton exports, but especially in the Southeast. Post-Savannah Port expansion, total cotton exports would be expected to increase by over 3½-percent, due to increased production possibilities. The share of cotton exports through the Panama Canal might increase by roughly 20-percent, and the share of cotton exports through Savannah could increase by nearly 35-percent.

The models result in a skewed and optimistic forecast for the Southeast cotton industry that may bear little resemblance to the current day realities of cotton trade, cotton production, cotton mill use, and cotton prices. The spatial equilibrium and logistics models used were not intended to forecast the future for the cotton industry, but rather provide justification for federal and state funding for the expansion of the Savannah Port shipping infrastructure showing opportunities and feasibilities for economic growth, trade, and agriculture.

Summary and Implications

The transportation system in the United States is of crucial importance to the efficiency and competitiveness of the US cotton industry. As global cotton mill use expands, greater demands will be placed on this system, especially as the Panama Canal expansion is completed and opens to larger container ships. Constraints and improvements in US transportation will ultimately influence cotton exports, shipping patterns, and world trade through the US Gulf and Atlantic ports.

Under most normal cotton shipping scenarios, the port of Los Angeles-Long Beach is dominant for exports to Asia, with Oakland continuing as an important port for Asian markets. Savannah and Houston also continue as major cotton export ports around the world. New Orleans, Charleston, and Norfolk remain key suppliers of cotton to Europe and the Middle East.

The completion of the Panama Canal expansion in 2016 has major implications for altered shipping patterns throughout the US. The expansion of the Savannah Port, to be completed in 2018, will permit the larger container ships to use and serve the Georgia facilities and Georgia agribusinesses and commodities.

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