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REPORT SUMMARY

Intermodal Chassis Availability for Containerized Agricultural Exports (Summary)

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This is a summary of "Intermodal Chassis Availability for Containerized Agricultural Exports" by Cyrus Ramezani and Chris Carr.[1] This research and analysis received funding from USDA's Agricultural Marketing Service (AMS) through cooperative agreement number 19-TMTSD-CA-0003. The opinions and conclusions expressed are the authors' and do not necessarily reflect the views of USDA or the Agricultural Marketing Service. The full report is available online at http//dx.doi.org/10.2139/ssrn.3810917.

WHAT IS THE ISSUE?

Containerized shipping has proliferated over recent decades and now represents a significant portion of U.S.-international trade. Agricultural shippers, in particular, have increasingly relied on containers as their exports have shifted away from bulk products toward high-value products (HVPs), that are less conducive to bulk shipping. However, although containerized shipping offers some shippers greater efficiency than bulk shipping, the practice still faces a critical challenge: shippers must match export traffic with empty containers and appropriate chassis.[2] Short supply of either containers or chassis can cause costly delays, particularly during export surges, such as around harvest periods.

Demand for chassis closely relates to the volume of containerized trade that passes through a region. Yet, container traffic often fluctuates in response to such factors as economic growth, currency fluctuations, and patterns of trade. Agricultural exporters face additional sources of uncertainty. Harvest periods cause demand for containers and chassis to surge as shippers transport farm products from rural production centers to port areas. Additionally, agricultural exports have increased steadily over recent decades (notwithstanding seasonal variation), and ports must constantly accommodate changing volumes. Thus, as trade volumes increase, container and chassis shortages become more costly and solutions, more urgent.

1 Cyrus Ramezani and Chris Carr are professors in California Polytechnic State University's Orfalea College of Business.

2 A chassis is a wheeled frame by which a trailer or container is moved by truck. For a successful pairing to occur, a container and chassis must be available at the right time and location at a competitive price; must match in size; and must comply with domestic and international regulatory requirements.

Taking a look at three California ports, a study from California Polytechnic State University examines container transit and its impact on chassis availability. Then, the study offers strategies for governments, shippers, and other stakeholders to mitigate perennial chassis shortages.

WHAT DID THE STUDY FIND?

The Rise of Perennial Chassis Shortages

To accommodate growing international trade, the containerized shipping industry underwent several transformations over the past several decades. Although many such changes have benefited shippers on net, they have also affected the transportation landscape for downstream logistics operators, such as chassis providers. The researchers set out to understand why perennial chassis shortages for agricultural exporters have worsened. To do so, they characterize several developments in the containerized shipping industry.

Particularly regarding trade with the Asia-Pacific region, U.S. imports have outpaced U.S. exports—often resulting in freight rates for imports exceeding those for exports by 2 to 3 times. This disparity incentivizes ocean carriers to return containers overseas as quickly as possible, even if they must forego loading the containers before return. As a result, agricultural exporters cannot always access the containers they require. Furthermore, as international trade has expanded, ocean carriers have increased the number and size of ocean vessels. The container vessel fleet has nearly doubled over the past 15 years, and many carriers have adopted "mega-ships," which allow greater returns to scale than smaller, traditional vessels. However, container ships that are larger and more abundant than in the past strain the land-side logistics system as shippers require more containers and chassis for each port call.

Chassis ownership is another dynamic facet of container shipping. Although, previously, ocean carriers were the primary chassis providers, they divested their chassis stock following the 2007/08 recession, leaving industry stakeholders to fill the demand with various chassis leasing and ownership models instead. Although chassis provisioning systems have improved over the last decade, challenges remain, and some innovations (such as not-for-profit chassis pools) are geographically limited in scope.

Evidence From California Ports

The researchers sought to understand determinants of perennial chassis shortages and HVP exports by examining traffic through three California ports—Los Angeles, Long Beach, and Oakland—between 1995 and 2020. Because every container requires a chassis to move by truck, studying container movements through each port provides a good proxy for chassis demand.

Each port exhibited strong seasonality, with both imports and exports generally troughing around February and peaking around August. At each port, exports (including empty containers) outweighed imports, particularly in the fall and winter months. The disparity between exports and imports is especially pronounced when considering empty container movements. For all ports, year-round over the study period, empty containers generally ranged between 25 and 30 percent of total exports. However, for the Port of Los Angeles in September over the study period, empty containers averaged as much as 55 percent of total exports. In contrast, empty container imports were considerably less common than empty container exports at all three ports. Moreover, peak periods of empty container exports often overlapped with those of agricultural exports. Thus, large volumes of would-be containers for agricultural exports were unavailable despite increased demand.

Proposed Chassis Solutions

Taking into account several primary concerns of different supply-chain stakeholders, the researchers proposed solutions for mitigating the effects of chassis shortages. Their solutions aim to increase freight reliability and reduce total transportation costs and length of transit time.

Motor carriers and shipper organizations can offset shortages by increasing their direct chassis investment. They could also develop a not-for-profit chassis pool dedicated to agricultural shippers. Such a development would pool risk among different stakeholders and serve as a buffer stock during periods of high chassis demand. The optimal level of chassis could be determined by statistical analysis of historical data.

HOW WAS THE STUDY CONDUCTED?

The researchers analyzed historical freight flow patterns and freight costs at each of the three ports of focus. Their insights were guided by industry agents and supply-chain representatives, including exporters of containerized agricultural goods. The researchers also reviewed various industry reports and attended industry-sponsored events.

PREFERRED CITATION

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