Is the Port Important?

There are a number of ways to measure the economic contribution of an industry or business like the Port of Charleston. One method utilizes an input-output model to determine the various linkages (upstream and downstream) of an industry. These models generate a multiplier analysis which indicates how much of a change activity is created by a unit change in industry output. These models present snapshots of the economy.

Regression analysis is another method. This technique allows the researcher to investigate the relationship over time. Daniel Fenton, a student researcher at the Office of Economic Analysis, recently conducted a regression analysis for the port. The mathematical model he created considers employment in the Charleston Metro region as a function of port activity. The statistical properties of the model indicate port activity is significantly related to total employment in the area. $R^2$ is a commonly used statistical measure; it indicates the percentage of employment that is statistically determined by port activity. In this case, the $R^2$ was both large in value and statistically significant. 80% of employment in Charleston can be explained by port activity. The chart below plots the predicted values from the model (red) compared to the actual values (blue). The model fits the data very well.

One must be careful in drawing conclusions about causation. This model does not provide an answer to the proverbial “chicken and egg” question. Regression analysis cannot prove that the port “caused” employment in Charleston. We could have reversed the model and concluded that employment in Charleston predicts 80% of port activity. Port activity and employment could have grown together due to another factor like the local economy.

Despite certain caveats, it is clear that port activity and employment in the Trident region have been highly correlated since 1993.