

Using Puerto Rico's ports to gauge government income

The Puerto Rico government filed for Title III bankruptcy protection on May 3 after multiple debt restructuring proposals were rejected by municipal bond creditors. Under last June's PROMESA legislation, which was specifically drafted to facilitate the remediation of Puerto Rico's debt crisis, the creditors were prohibited from bringing legal action against the Commonwealth until the night of May 1. The filing of Title III appeared to have caught some market participants off guard and officially makes the over \$70 billion filing the largest bankruptcy of a US municipality (the city of Detroit, Michigan was previously the largest municipal bankruptcy with almost \$20 billion in debt).

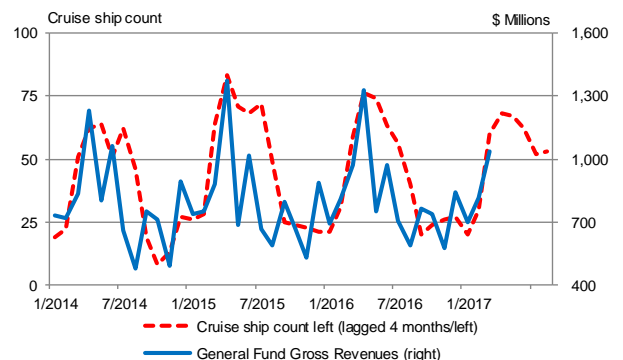
The island's debt problems were largely due to fiscal mismanagement on the spending side, which were compounded by Federal minimum wage laws, the financial crisis, Zika virus outbreaks starting in 2016, and the mass exodus of workers to the mainland in search of employment. The commonwealth's ability to increase tax revenue through stimulating the economy will likely be one of many key areas of focus during the bankruptcy proceedings.

According to data from the Government Development Bank for Puerto Rico, the services industry made up 12.9% of the island's GDP in 2015 (the last year the island reported.) It is also important to note that almost 35% of the island was employed in by the services industry in 2016, with a large portion of them working in tourism and hospitality. Given that approximately a third of tourists enter the island on cruise ships, their traffic could provide an indicator of the health of that industry on the island.

One way to measure cruise ship traffic is to monitor the daily number of cruise ships at port. Using IHS Markit's almost real time ship tracking technology, we tracked the number of cruise ships at port in Puerto Rico from 2014 until April 2017. Although not included in this analysis, there is also data available on the ship's size, cargo for tankers and container ships, final destination, and the amount of time spent at port. There is good precedent for this type of analysis. Indeed, some quantitative investment managers use satellite imagery of large retailer's parking lots to project store revenue. Imagine if you could not only count the cars in the parking lot, but also know the model and year of the car along with the owner's name and contents inside the trunk.

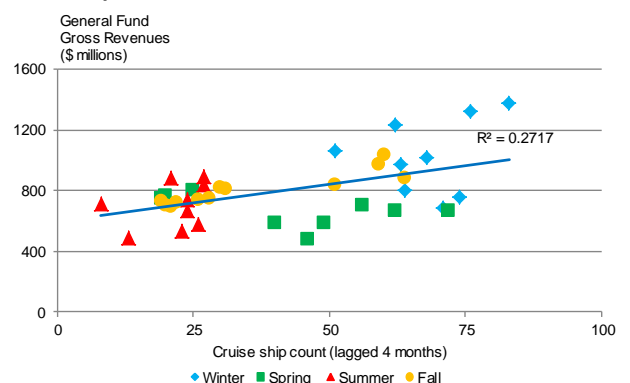
The cruise ship data did correlate to some degree with general fund gross revenues (includes most taxes, federal revenue, and certain miscellaneous revenue) reported by the Government Development Bank for Puerto Rico. However, the correlation is only apparent when the cruise ship data is lagged four months (**Figure 1**). The lag overlays the peak cruise ship month of December with April's peak in tax revenue driven by annual tax collections, and subtle declines in cruise ship count appears to indicate a higher potential for a decline in general fund gross revenues. **Figure 2** shows the correlation ($R^2 = 0.2717$) between lagged ship count data during the actual season and tax revenue. The data also highlights the expected declines in cruise ships during peak hurricane season.

Figure 1: Cruise ship counts on a four month lag versus general fund gross revenues (\$millions)



Source: IHS Markit, Government Development Bank for Puerto Rico

Figure 2: Cruise ship count (4-month lag) and actual season versus general fund gross revenues (\$millions)¹



Source: IHS Markit

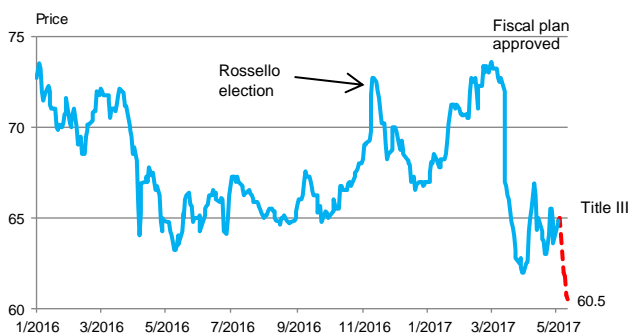
¹ Includes September 2013-November 2016 cruise ship counts and January 2014-March 2017 general fund gross revenues,

Since the filing, institutional size trading volumes on the benchmark Puerto Rico GO 8.0% 7/2035 have slowed and the price has been declining. The May 11 closing price of the issue was 60.50 (**Figure 3**), which was almost 7% lower than the May 2 closing price of 64.75. **Figure 4** shows the bond price declines for select non-insured bonds from the five largest PR issuers: general obligation (GO), Government Development Bank for Puerto Rico (GDB), Puerto Rico Electric Power Authority (PREPA), Puerto Rico Public Buildings Authority (PBA), and Puerto Rico Sales Tax Financing Corporation (COFINA). The chart indicates that the COFINA 8/2030 5.625% issue declined the most at almost 44% since March 1, while the PREPA 7/2021 5.250% issue fared the best, increasing almost 3% during the same time period. Each issue in the graph was chosen because it had the highest 2017 YTD average daily dealer quote depth data for that issuer (**Figure 5**). Our [Measuring municipal bond market liquidity](#) special report released on May 9, 2016

indicated a direct relationship between the number of dealers quoting a bond and its likelihood of trading.

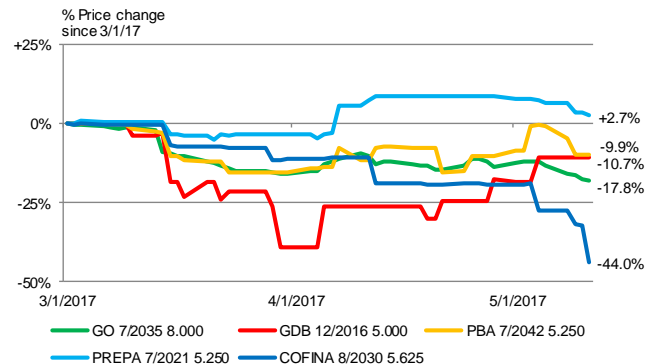
This preliminary analysis of shipping tracking data suggests one of potentially many applications for using the data to assess municipal credit. The full dataset includes almost every category of large ship and could potentially provide new factors for economic and commodity price models. It is also worth noting that the analysis only focused on the income side of the credit equation and it is the changes in the island's expenditures that warrant the most focus at this time. Nevertheless, with some refinement and an expansion of the dataset, the ship data could potentially provide an advanced indicator that can be added to existing economic models to determine when Puerto Rico's dire situation begins to change course.

Figure 3: Puerto Rico GO 8.0% 7/2035 bond prices declined sharply after filing for Title III



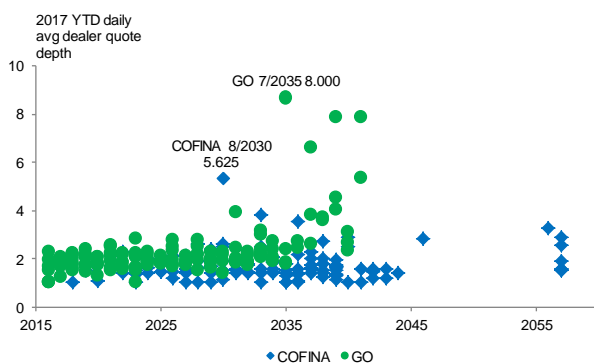
Source: IHS Markit

Figure 4: Price performance for Puerto Rico's five largest issuers

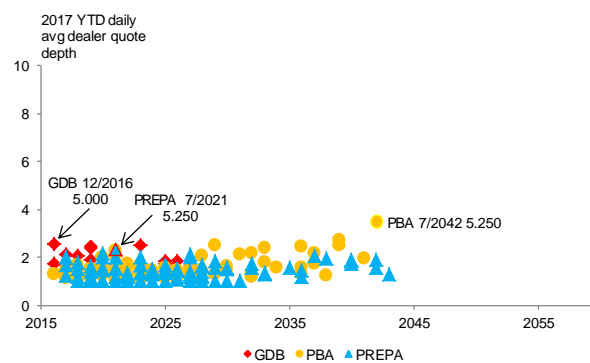


Source: IHS Markit

Figure 5: 2017 YTD average dealer quote depth for Puerto Rico's five largest issuers



Source: IHS Markit



Source: IHS Markit



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