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ANTHOLOGY

The Demand for Bolivian Tin

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Bolivia's export industry has been very limited for many years, and the collapse of the tin market, Bolivia's main export good, has made the situation more serious. The present paper presents the first estimates of the export demand for Bolivian tin. Annual data from 1960-89 were collected and the logarithm of the quantity of tin exported by Bolivia (*L TIN*) were regressed on six independent variables. The independent variables include the logarithm of the price of tin in the international market (*LPTIN*), the logarithm of the exchange of bolivianos per dollar (*LEXRATE*), the logarithm of U.S. GNP (*LUSGNP*), the logarithm of the quantity of tin exported by Malaysia (*LMTIN*), a time trend (*TTREND*), and a dummy variable (*CRASH*). The value of 1 was given for years after the collapse of the tin market in 1985 and 0 for the other years. All dollar amounts have been deflated.

The model is estimated by OLS. The authors expect all variables to have a negative sign except *LUSGNP*. As the price of tin in the international market rises, the authors predict a decline in Bolivian exports. As the Bolivian currency becomes less valuable relative to the dollar, one would expect less confidence in the Bolivian tin industry and, therefore, lower exports of tin. The negative sign on *LMTIN* reflects the expected relationship between Bolivian tin and that of Bolivia's main competitor. The negative sign on *TTREND* reflects the recent decline in the tin industry. The negative sign is expected on the *CRASH* dummy variable because the market collapsed in late 1985. The *LUSGNP* variable is expected to be positive since the U.S. has been the largest importer of Bolivian tin for the past 30 years. The estimated model is:

$$\begin{aligned}
 L TIN = & -19.104 - .163LPTIN - .050LEXRATE + 3.287LUSGNP \\
 & (3.17) \quad (0.95) \quad (3.27) \quad (3.85) \\
 & - .125LMTIN - .090TTREND - .395CRASH \quad R^2 = .89. \\
 & (.62) \quad (3.52) \quad (2.31)
 \end{aligned}$$

The figures in parentheses are the absolute values of t-ratios. All of the coefficients have the expected sign and all are statistically significant except *LPTIN* and *LMTIN*.

The model shows that there is a direct relationship between the quantity of tin exported by Bolivia and the strength of the boliviano. The negative sign on *TTREND* is consistent with the general decline of the tin industry. As expected, the demand for Bolivian tin is positively related to U.S. GNP. The price of tin and the exports by Malaysia are not statistically significant but do have the expected signs. The fact that they are not statistically significant is not particularly troubling because of the price restrictions and export limits imposed on the industry by the International Tin Council [*Modern International Economics*, 1988].

The model presented above is the first attempt to estimate the export demand for Bolivian tin. Tin is the leading export of Bolivia and understanding export demand is critical for the Bolivian economy and deserving of further research.