This code visualizes trades and the top of the order book for US 10Y Treasuries on 2012-10-26 using clock time and tick time. The mid price and micro prices are also graphed versus tick time. Figure 1 below shows the graph generated for the order book with respect to tick time.

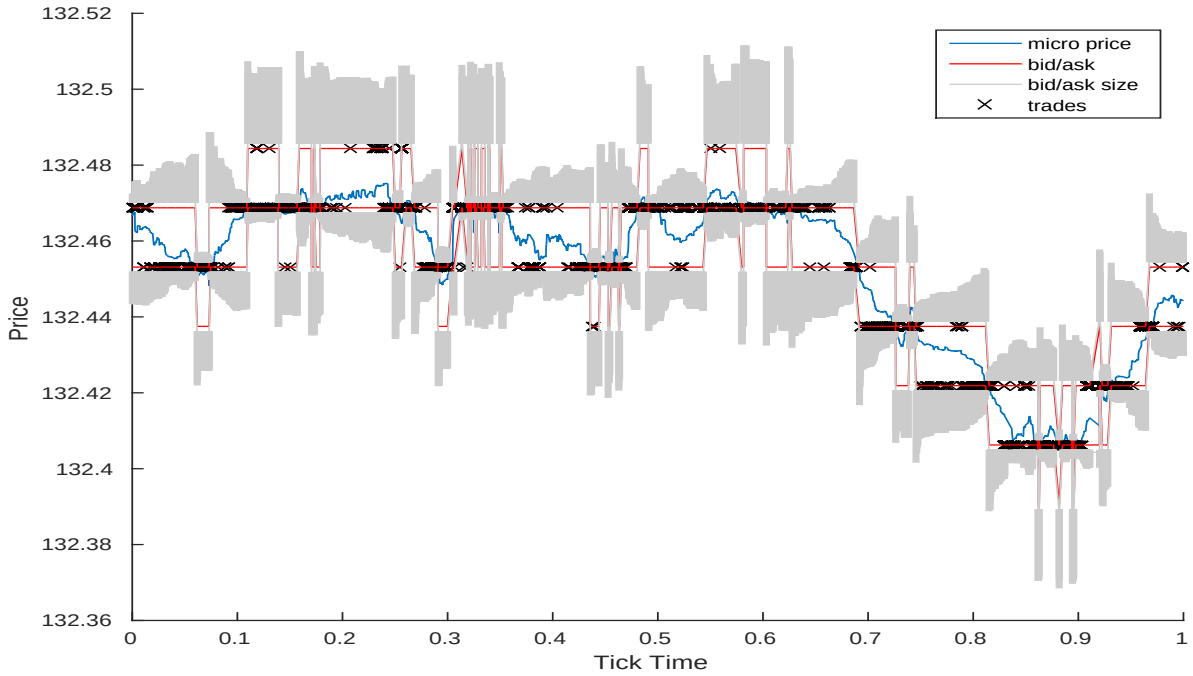

Figure 1: US 10YR Future Order Book

Exogenous market impact effects are investigated by regressing changes in the micro price on to lagged signed trades, shown in Equation 1. The assumption is made that if the transacted trade price is closer to the bid then the trade is a sale and similarly if the transacted trade price is closer to the ask then the trade is a buy.

$$\Delta P_\kappa = \beta_1 \Delta SgnQ_{\kappa-1} + ... + \beta_{10} \Delta SgnQ_{\kappa-10} + \epsilon_\kappa \tag{1}$$

The R^2 of this model is 0.0737 which is a large improvement over a model including only 1 lag, which has an R^2 of 0.0178. Both sets of residuals exhibit significant autocorrelation indicating further improvement could likely be made through fitting some form of ARIMA model.