Cost of Credit and Liquidity

Regression

Question

How does liquidity in the secondary bond market affect the cost of debt?

$$cs_{it} = \alpha_q + \alpha_{rating,q} + \beta_q \cdot liq_{it} + \gamma_{0,q} \cdot \mathbf{x}_t^{agg} + \gamma_{1,q} \cdot \mathbf{x}_{iq}^{fs} + \varepsilon_{it}$$

i =bond, t =day, q =quarter.

- $\mathbf{x}_t^{agg} = [r_t^{3m}, r_t^{10y} - r_t^{1y}]$
- $\mathbf{x}_{iq}^{fs} = [\text{Operating Margin}_{iq}\ , \text{Debt/Capital}_{iq}, \text{Cash/Debt}_{iq}]$
- $liq \in \{\text{BA spread, Turnover, Price Impact}\}$.

2SLS approach

- *liq* is instrumented with the (lagged) average of the same measure across other bonds with the same rating in the same quarter:

$$liq_{iq}^{IV} = \frac{1}{N} \sum_{i \in rating, \tau \in q-1} liq_{i\tau}$$

- each variable in $\mathbf{x}^{fs}$ is instrumented with its own lagged value

Liquidity Measures

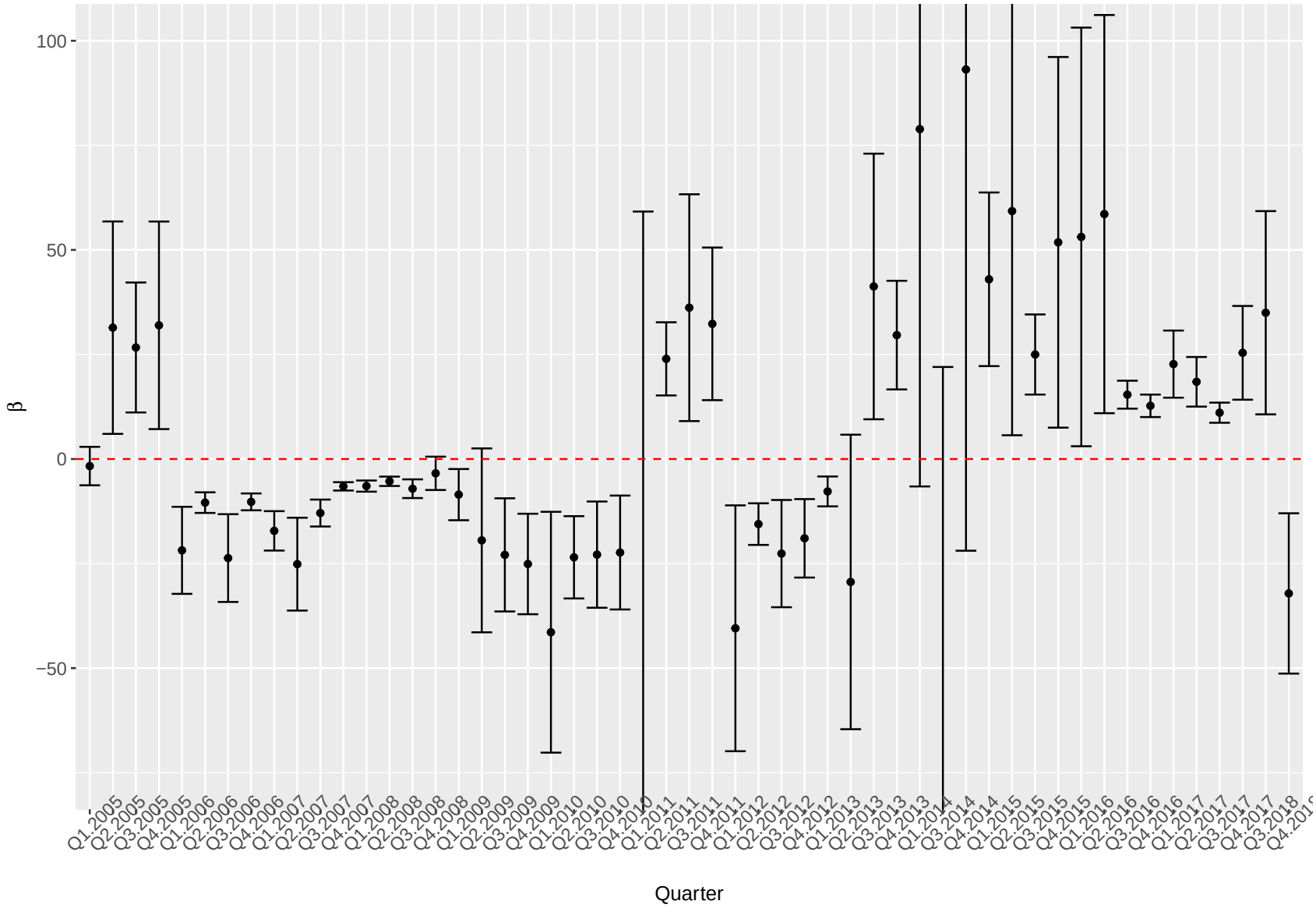
- $Bid_{it} = \frac{\sum_{h \in t \text{ Sell, D-to-C}} vol_{it:h} \times P_{it:h}}{\sum_{h \in t \text{ Sell, D-to-C}} vol_{it:h}}$
- $Ask_{it} = \frac{\sum_{h \in t \text{ Buy, C-to-D}} vol_{it:h} \times P_{it:h}}{\sum_{h \in t \text{ Buy, C-to-D}} vol_{it:h}}$
- Bid-Ask spread$_{it} = 2 \times \frac{MA(Bid_{it},7d) - MA(Ask_{it},7d)}{MA(Bid_{it},7d) + MA(Ask_{it},7d)}$
- $Turnover_{it} = \frac{1}{N} \sum_{h \in t} \frac{vol_{it:h}}{outstanding_{it}}$
- Turnover alternative$_{it} = \frac{1}{N} \sum_{h \in t} \frac{P_{it:h} \times vol_{it:h}}{outstanding_{it}}$
- Price Impact (?)

Credit Spread

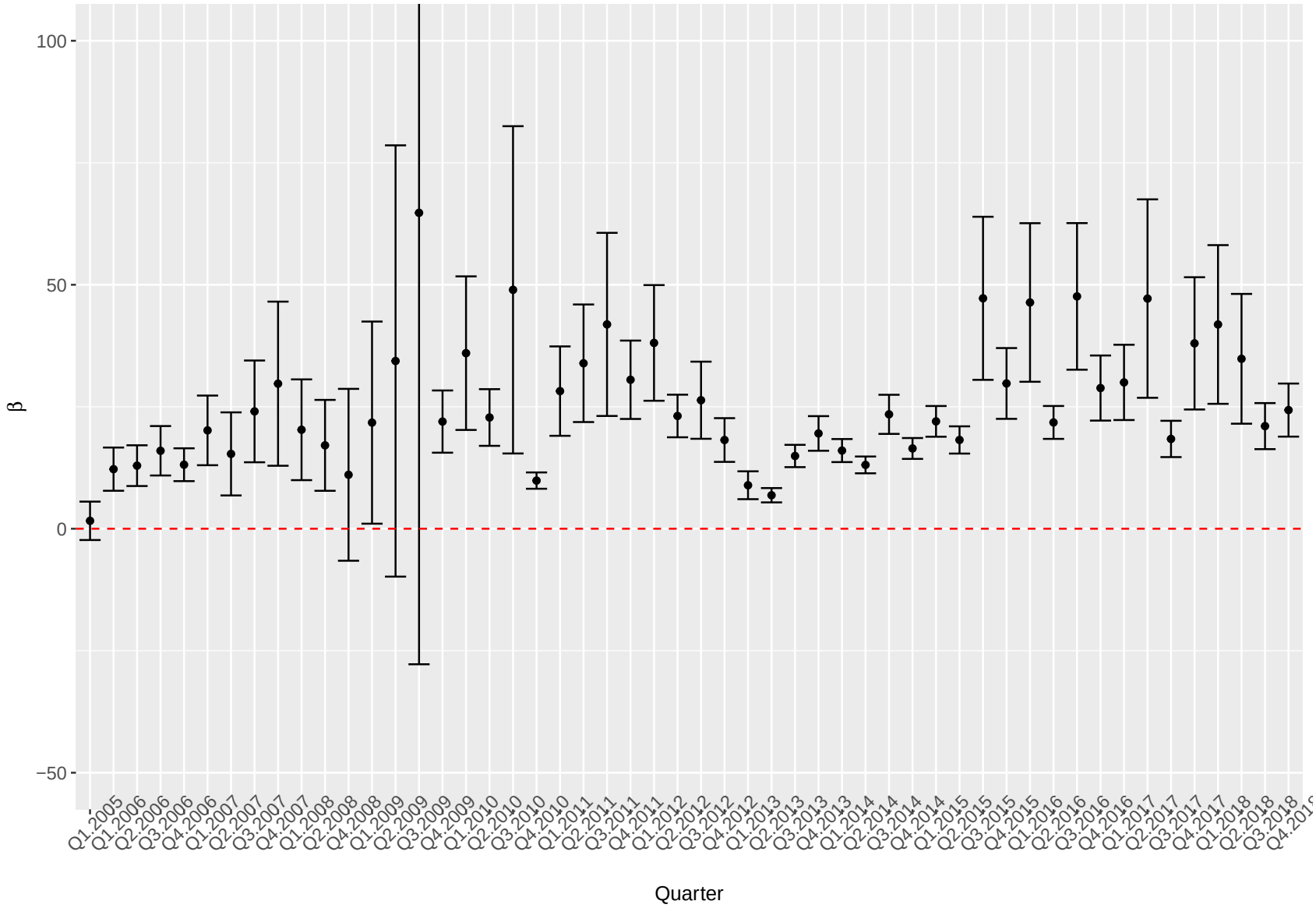
$$y_t^{rf}(\tau) = \theta_1 + \theta_2 \left(\frac{1 - \exp(-\lambda\tau)}{\lambda\tau} \right) + \theta_3 \left(\frac{1 - \exp(-\lambda\tau)}{\lambda\tau} \right) - \exp(-\lambda\tau))$$

- Estimate Nelson-Siegel parameters $(\lambda, \theta_1, \theta_2, \theta_3)$ using daily data on the yield curve
- For each bond at every date, compute the risk free yield using the appropriate maturity
- $cs_{it} = y_{it} - y_t^{rf}(\tau)$.

Bid-Ask Spread



Turnover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Q3 2018
Quarter

Turnover alternative