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Estimate following model

$$\mathrm{Re}t_{i,t} = A_i + B_i(K_o dsent + \sum_{i=1}^{12} K_j \cdot fj\_dsent) \qquad for \quad i = 1 \ to \ 49$$

$$\mathrm{Re}\,write\ the\ \mathrm{mod}\,el\ as\ ,$$

$$\mathrm{Re}t = A + XB + U \qquad (1)$$

$$X = FK + V \qquad (2)$$

$$where, \quad \mathrm{Re}t = \begin{pmatrix} \mathrm{Re}t_{1,1} & \mathrm{Re}t_{2,1} & \ldots & \mathrm{Re}t_{49,1} \\ \mathrm{Re}t_{1,2} & \mathrm{Re}t_{2,2} & \ldots & \mathrm{Re}t_{49,2} \\ \vdots & & & \vdots \\ \mathrm{Re}t_{1,T} & \mathrm{Re}t_{2,T} & \ldots & \mathrm{Re}t_{49,T} \end{pmatrix}_{T\times 49}$$

$$F = \Big(dsent, \quad f1\_dsent\ , f2\_dsent\ , \cdots f12\_dsent \Big)_{T\times 13}$$
$$Normalization: K_0 = 1$$

Ret contains monthly returns of Fama-French 49 industry portfolios, dsent is the first difference of the monthly sentiment index. $f1\_dsent \cdots f12\_dsent$ are the 12 forwards of dsent. U and V are assumed to be uncorrelated multivariate normal.

X is latent, and we are interested in parameter K, A and B.

Estimation Methods: Two Step Recursive Regression.

1. Start with a prior choice of $K = K_0$, calculate a series of $X_0 = F \times K_0$
2. Run a standard regression of (1) using $X = X_0$, save $\widehat{A}, \ \widehat{B}$
3. Let $\widehat{\mathrm{Re}}t_i = \mathrm{Re}t_i - A_i - B_i dsent$ and $FF = \big(f1\_dsent\ , f2\_dsent\ , \cdots f12\_dsent\big)_{T\times 12}$

   Stack $\widehat{\mathrm{Re}}t_{49\times T}$ into a vector $\widehat{R}_{49T\times 1}$, define $BF = \widehat{B} \otimes FF$, so BF is a $49T \times 13$ matrix.
4. Regress $\widehat{R} = BF \times K + v$, save coefficients $\widehat{K}$, let $K_1 = \widehat{K}$
5. Repeat above steps until sum of squared difference between $K_t and \ K_{t-1} < e-5$

Apply this procedure to a rolling subsamples of 48 month, with both equally weighted/Value weighted industry portfolio returns.

The estimates of A, B and K are saved in '120312.xlsx'.report 120312.xlsx