Workshop on using big data for forecasting and statistics

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CAN INFORMATION DEMAND HELP TO PREDICT STOCK MARKET LIQUIDITY ? GOOGLE IT!

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THE STORY

Theory

Infinite information processing abilities

New information is immediately incorporated into stock prices (Fama,1970)

Merton (1987), Barber and Odeon (2008)

Demand for Information

Stock market dynamics

Reality

Infobesity: Huge amounts of information
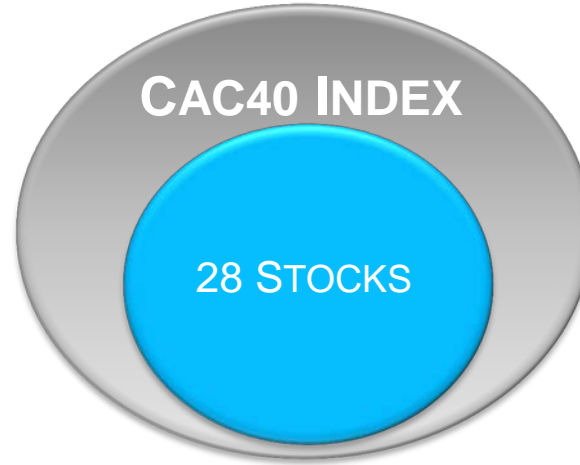
Limited time and scarce attention

OUR AIM

EXISTING STUDIES

▶ Da et al. (2011), Vlastakis and Markellos (2012), Aouadi et al.(2013)

▶ Drake et al. (2012) and Vlastakis and Markellos (2012)

▶ Askitas and Zimmermann (2009), Kulkarni et al. (2009), Da et al. (2011) and Dzielinski (2011)

CENTRAL QUESTION

Can *information demand* help to forecast the French stock market *liquidity*?

1 <u>SAMPLE</u>

2 <u>DATA</u>   Google Insights for search data, Several liquidity measures

3 <u>PERIOD</u>   From *January* 09, 2004 to *June*, 22, 2012

MODELS

▶ IN SAMPLE ANALYSIS

1
$$Turnover_{it} = \alpha + \beta_1 Turnover_{i,t-1} + \beta_2\,Ln(Number\_of\_Analysts)_{i,t-1} + \beta_3 Ln(Number\_of\_Employees)_{i,t-1}$$
$$+ \beta_4 Ln\,(Market\_Value)_{i,t-1} + \beta_5\,Inverse\_of\_Stock\_\Pr ice_{i,t-1} + \beta_6 Absolute\_return_{i,t-1} + \beta_7 Std\_Dev_{i,t-1} + \varepsilon_{it}$$

2
$$Turnover_{it} = \alpha + \beta_1 Turnover_{i,t-1} + \beta_2\,Ln(Number\_of\_Analysts)_{i,t-1} + \beta_3 Ln(Number\_of\_Employees)_{i,t-1}$$
$$+ \beta_4 Ln\,(Market\_Value)_{i,t-1} + \beta_5\,Inverse\_of\_Stock\_\Pr ice_{i,t-1} + \beta_6 Absolute\_return_{i,t-1} + \beta_7 Std\_Dev_{i,t-1} + \lambda_1 Ln(GSV)_{i,t-1} +$$
$$\lambda_2 Ln(GSV)_{CAC40,t-1} + \varepsilon_{it}$$

▶ OUT-OF-SAMPLE ANALYSIS

1
$$RMSE_i = \sqrt{h^{-1} \sum_{t=T+1}^{T+h} (l_{it} - \hat{l}_{it})^2}$$

2
$$MAPE_i = h^{-1} \sum_{t=T+1}^{T+h} \left| \frac{l_{it} - \hat{l}_{it}}{l_{it}} \right|$$

NEW RESULTS

1   Google variables and turnover are ***positively*** and ***strongly*** correlated in most cases

2   Google search variables contribute to ***better*** understand liquidity formation in the French stock market

3   Higher level of Google search volume leads to ***higher*** turnover for the majority of our sample

4   Model (2) leads to ***more precise*** out-of-sample forecasts in most cases and for almost all horizons

SUMMARY & CONCLUSION

1 **Implications for Liquidity Forecasting**

▶ It is possible to predict liquidity using publicly available variables

▶ Information demand is able to refine liquidity forecasting results

2 **Implications for Academics & Practitioners**

▶ Better understand the dynamic of liquidity series, and help portfolio managers to conceive less costly trading strategies.

▶ The importance of including online investor search behavior in forecasting important economic outcomes.