This paper studies how learning about future demand shocks affects investor behavior and market outcomes. Under the noisy rational expectations equilibrium (NREE) framework, I show that with extra access to information about future demand shocks, investors learn less about current dividend and demand shocks, and allocate more precision to signals about future demand shocks via the front-running channel and a new future uncertainty channel. The front-running channel suggests that if investors learn that the future demand is high (low), they would buy (sell) assets today so that they can sell (buy) in the future. Meanwhile, dividend information acquisition decreases, which makes dividends riskier and leads to higher risk premia; on the individual level, information about future demand shocks decreases the conditional variance of future excess payoffs. Thus the investor’s ex ante utility improves.

I also show that price volatility increases due to more heterogeneous private information, and that learning about future demand shocks makes price more informative in the future but less informative in the present.

Contribution

This paper contributes to the NREE literature:

- Verrecchia (1982) and Cai (2017) show that information acquisition in a perfectly competitive and noisy rational expectations economy, respectively.
- Jaimovich and Rebele (2009) study how learning about future demand shocks decreases the conditional variance of future excess payoffs. This paper complements it by highlighting the importance of learning about future demand shocks. The front-running channel also echoes with the general idea in Beaudry and Portier (2014).
- This paper also contributes to the literature on high frequency traders (HFT). Empirical evidence has shown that HFTs predict order flows (Hirschey, 2018) or price changes (Harris and Saad, 2014), which can be mapped into acquiring a signal for future demand shocks in this paper. This paper finds that with access to information about future demand shocks, investors are better off, which is consistent with Jovanovic and Merkved (2017) who empirically find a more profitable welfare effect.

Model

Standard CARA-normal competitive market noisy rational expectations equilibrium (NREE) model with:

- Asset: A risk-free asset with return $r$.
- A single tradable risky asset with time-$t$ payoff $r_p + d_t$, where $d_t = \mu + \rho \zeta_t + \eta_t$.
- Demand shocks $\zeta_t$ are modeled as shocks to asset supply $\eta_t$, $\eta_t = 0$, static model; $\zeta_t = 1$, dynamic.
- Three private signals:
  - Signal about current fundamental shock: $x^{\eta}_t = \eta_t + \rho^c \zeta_t$.
  - Signal about current demand shock: $x^{\zeta}_t = \zeta_t + \rho^d \eta_t$.
  - Signal about future demand shock: $x^{\eta^f}_t = \zeta_t + \rho^d \eta_t$.
- OLG investors:
  - live for two periods and maximize terminal wealth;
  - choose signal precision $\tau_\eta(t)$ and $\tau_\zeta(t)$ subject to linear information capacity constraint $\rho^c \tau_\eta(t) + \rho^d \tau_\zeta(t) + \rho^d \tau^f_\eta(t) = K$ (or a convex constraint);
  - make portfolio choices $q_t$ and $q_{t+1}$ subject to budget constraint $\Delta w_{t+1} = r^{-1} \Delta W_t + \alpha q_t + \beta q_{t+1} - \beta p_{t+1} q_{t+1}$.

Numerical Results: Dynamic Model

The results of the static model can be extended to the dynamic model, as confirmed by the following numerical exercises. The following results compare the dynamic model with the case where learning about the future is not possible.

Result 1: Heterogeneous private information increases price volatility.
- Extensive margin: two co-existing generations become different
- Intensive margin: the older generation has more private information

Result 2: Less fundamental information acquisition leads to higher risk premium
- Less fundamental information acquisition $\implies$ average posterior variance of fundamental shocks, $\Sigma_{k}$, is larger $\implies$ higher risk premium.

Empirical Application

This model can be applied to a broad range of real-world scenarios where investors are able to learn about future demand shocks. I discuss the BGI transaction here.

BlackRock, Inc. acquired Barclays Global Investors (BGI), including iShares in 2009. BlackRock struck the deal to ‘‘broaden the firm's investment capability with passive and quantitatively-invested strategies, particularly exchange-traded funds.'’ Observing the news of the completion of the BGI transaction on Dec 1, sophisticated investors expect the iShares AUM to expand in the following years. For the component stocks of iShares ETFs, these are future demand shocks that are not related to their firm fundamentals.

In 2009, around 25% of iShares’ net assets were concentrated on iShares Core S&P 500 ETF. I then look at the share prices of S&P 500 component firms and non-S&P firms around the BGI announcement. Adding year fixed effect and controlling for the total asset size, GDP growth, risk measures, book-to-market ratio and past returns, the share prices of the S&P component firms increase 5 percentage points in the 2 years following the BGI transaction compared with non-S&P firms, of which around 50% can be explained by the front-running channel and 20% by the future uncertainty channel.

References


BlackRock, Inc. and iShares ETF’s [Online].

Cai, Zhiheng, 2017, ‘‘Information processing capacity and stock returns: Evidence from iShares ETFs’’.


