Available online at www.sciencedirect.com
ScienceDirect
Journal of Financial Economics 88 (2008) 406–423
JOURNAL OF Financial ECONOMICS
www.elsevier.com/locate/jfec

Trading imbalances, predictable reversals, and cross-stock price pressure ☆

Sandro C. Andrade[a], Charles Chang[b], Mark S. Seasholes[c,*]

[a] *University of Miami, School of Business, P.O. Box 248094, Coral Gables, FL 33124, USA*
[b] *Cornell University, 435 Statler Hall, Ithaca, NY 14853, USA*
[c] *Santa Clara University, 500 El Camino Real - Finance, Santa Clara, CA 95053, USA*

Received 6 March 2006; received in revised form 12 April 2007; accepted 24 April 2007
Available online 12 March 2008

Abstract

We test the implications of a multi-asset equilibrium model in which a finite number of risk-averse liquidity providers accommodate non-informational trading imbalances. These imbalances generate predictable reversals in stock returns. An imbalance in one stock also affects the prices of other stocks. The magnitude of the cross-stock price pressure depends on the correlations of the stocks' underlying cash flows. The model implies that non-informational trading increases the volatility of stock returns. We confirm the model's implications using data from the Taiwan Stock Exchange.

JEL classification: G12; G15

Keywords: Return reversals; Return predictability; Excess volatility

1. Introduction

This paper studies security pricing in the face of random, non-informational order flows. We present a multi-stock equilibrium model in which a finite number of risk-averse liquidity providers accommodate non-informational trading imbalances. As in single-stock models, liquidity providers are compensated via future price reversals.[1]

☆ We thank a national securities firm in Taiwan for providing the margin data, as well as Brad Barber, Neil Yi-Tsung Lee, Yu-Jane Liu, and Anlin Chen for contributing the time-series data of risk factors. Terry Hendershott and an anonymous referee have provided invaluable comments and suggestions. We are grateful to Malcolm Baker, Alex Boulatov, Brad DeLong, Greg Duffee, Darrell Duffie, Robin Greenwood, Ron Kaniel, Arvind Krishnamurthy, David Levine, Rich Lyons, Darius Miller, Stefan Nagel, Matt Pritsker, Avanidhar Subrahmanyam, Heather Tookes, and Masahiro Watanabe. We have benefited from participant comments at the Darden International Finance Conference, the NBER Conference on the Effect of Imperfect Trading on Security Prices, the 2006 WFA meetings, Goldman Sachs Asset Management, and Barclays Global Investors as well as the finance departments at Cornell University, Kellogg, Rice University, Stanford, U.C. Berkeley, University of Houston, U.T. Dallas, and University of Wisconsin.

* Corresponding author.
E-mail address: Mark.S.Seasholes@emailias.com (M.S. Seasholes).

[1] Examples of single-stock models include Amihud and Mendelson (1980), O'hara and Oldfield (1986), Grossman and Miller (1988), Campbell, Grossman, and Wang (1993), Spiegel and Subrahmanyam (1995), Holden and Subrahmanyam (2002), Llorente, Michaely,

0304-405X/$ - see front matter © 2008 Published by Elsevier B.V.
doi:10.1016/j.jfineco.2007.04.005

In our multi-stock framework, a demand shock for only one stock affects prices of other stocks due to the hedging desires of liquidity providers. The relative attractiveness of other stocks as hedging instruments depends on the correlation of their cash flows with the cash flows of the first stock. Therefore, the model implies that a demand shock in one stock has greater impact on the prices of more correlated stocks. To understand the transmission mechanism, consider a two-stock market. Suppose there is a non-informational order to buy stock *i* and no orders to trade stock *j*. Risk-averse liquidity providers become sellers of stock *i*. They can partially offset the resulting position by buying stock *j* whose cash flows are positively correlated with stock *i*'s cash flows. Behaving competitively, liquidity providers bid up the price of stock *j* and transmit part of stock *i*'s initial price increase to stock *j*—even in the absence of stock *j* trading. Throughout the paper, price effects that are transmitted by liquidity providers across stocks are referred to as "cross-stock price pressure."

Our empirical analysis of price reactions to non-informational trading is motivated by the framework described in the paragraph above. We use weekly data from the Taiwan Stock Exchange ("TSE") to test implications and restrictions of the model. The data include all 607 listed stocks from January 1994 to August 2002. The exchange collects and publishes the number of shares of each stock held long in margin accounts at the end of every day. Margin accounts are owned by individual investors at local brokerage companies. Changes in margin account holdings are our proxy for the non-informational trading imbalances in the model. Regression analysis shows that positive trading imbalances in stock *i* are linked to its price increasing and later reverting. The same trading imbalance is also linked to other stocks experiencing predictable price reversals. We show that this cross-stock price pressure is higher among stocks with more correlated cash flows than among stocks with less correlated cash flows. The model implies two sets of nonlinear restrictions on regression coefficients that are functions of cash flow correlations. We fail to reject the restrictions at all conventional levels, which shows that the relative magnitude of the observed cross-stock price pressure is consistent with model predictions.

We use a sorting procedure to quantify the economic magnitude of the price pressure and verify the robustness of regression results. Stocks are sorted based on weekly trading imbalances. The prices of stocks in the highest quintile (buys) increase, while the prices of stocks in the lowest quintile (sells) fall. The return difference between these two quintiles is 242 basis points (bp), on average. Prices then revert towards pre-sort levels over the next ten weeks. Both the magnitude and duration of the reversals are economically and statistically significant. Throughout the paper, we mitigate the possibility of spurious results arising from bid-ask bounce by using weekly returns that are measured starting with the opening price the week following a sort. Therefore, stocks are sorted into portfolios on the basis of trading imbalances from Monday to Friday, and returns are measured starting with the opening price the following Monday. Our approach addresses concerns that a large number of buy (sell) orders during a given week increases the probability that prices end the week at the ask (bid) price (see Blume and Stambaugh, 1983; Chordia and Subrahmanyam, 2004; Subrahmanyam, 2005b).

In addition, the model implies that stock returns experience "excess volatility." Stock returns are more volatile than underlying cash flows because random trading imbalances move stock prices away from their fundamental values. We show that, after controlling for cash flow volatilities, stocks with more volatile trading imbalances have more volatile returns.

Our analysis indicates that risk-averse traders are compensated for absorbing order imbalances. Liquidity is valuable and agents with a comparative advantage in providing liquidity can profit by doing so. Extending this line of reasoning, day traders and hedge funds potentially provide a socially valuable service (i.e., liquidity) as they seek profits and engage in short-term trading strategies. Second, our results suggest that excess stock price volatility is attributable at least in part to the fact that liquidity is valuable. Price movements beyond changes in underlying fundamentals could serve as a signal to liquidity providers as to where their services are needed.

(*footnote continued*)
Saar, and Wang (2002), Chordia and Subrahmanyam (2004), and Subrahmanyam (2005a, b). Our framework is a multi-stock extension of Grossman and Miller (1988) and Holden and Subrahmanyam (2002).