International Review of Financial Analysis 28 (2013) 1–8

Contents lists available at SciVerse ScienceDirect

International Review of Financial Analysis

Asymmetric dynamic relations between stock prices and mutual fund units in Japan. An application of hidden cointegration technique

Christos Alexakis [a,*], Apostolos Dasilas [b,1], Chris Grose [b,2]

[a] Department of Economics, University of Piraeus, 80 Karaoli and Dimitriou, 18534 Piraeus, Greece
[b] School of Economics and Business Administration, International Hellenic University, 14th klm Thessaloniki-Moudania, 57101 Thessaloniki, Greece

ARTICLE INFO

Article history:
Received 28 November 2012
Received in revised form 13 December 2012
Accepted 2 February 2013
Available online 9 February 2013

JEL classification:
G11
G14
G32

Keywords:
Mutual fund flows
Stock returns
Hidden cointegration

ABSTRACT

This paper examines "causality" effects between mutual fund flows and stock index prices in Japan. In particular, both the short and long run dynamics between stock prices and fund units are investigated. The novelty of our paper is the use of the hidden cointegration technique which attempts to capture heterogeneous fund flow reactions when stock index prices move up or down. Moreover, we employ the crouching error correction model (CECM) to assess the relationship between stock market movements and fund flow changes. The results show that stock prices and mutual fund units are cointegrated. In the case of positive movements there is a bi-directional effect interconnecting them, whereas for negative movements, causality runs only from fund flows to stock prices. The dynamics structure provides evidence that market microstructure, taxation and investors' sentiment affect stock price and unit formation.

1. Introduction

The mutual fund industry has received much media coverage and academic research due to its exponentially increasing importance in financial markets and its explosive growth in terms of money invested and investors' interest. The fact that mutual funds have become a major investment instrument in the asset management process is evident from the immense relevant literature in the last three decades. This growing focus on mutual funds induced by the ever increasing demand for profitable investments and risk hedging is alleged to be associated with remarkable price fluctuations in capital markets. However, prior research attempting to unveil the relationship between market volatility and investor decisions mainly relied on the predictive ability of forecasting models. As a natural response, scholars strive for formulating the mechanisms that associate stock market behavior with investors' sentiment as captured by the bulk of purchases and redemptions of mutual fund units.

Behavioral aspects of mutual fund trading activity, though relatively underestimated, are perceived to be one of the driving forces behind the market reaction to mutual fund transactions. The theoretical framework behind the behavioral finance approach underlines that, over certain conditions, institutional investors' trading activity could result in the deviation of asset prices from the assumptions of the rational discounted cash flow hypothesis (Indro, 2004). If investors' sentiment is the irrevocable tie between mutual fund flows and market returns, then disentangling the particular premises that underpin this relationship could strengthen investment managers' capabilities to exploit potential excess returns.

Theory was built upon two closely related hypotheses, namely, the information and the feedback trading hypotheses. The former posits that inflows and outflows of funds react to good and bad news in the underlying stock market indices, while the latter argues that positive or negative past period returns directly affect fund flows either way, respectively. Additionally, the temporary price pressure hypothesis sheds further light on the issue identifying a concurrent impact of fund flows on security prices that is reversed in the coming periods (Ben-Rephael, Kandel, & Wohl, 2011).

In addition to the behavioral approach, market microstructure characteristics may also influence stock price formation and mutual fund flows. Market microstructure is concerned with the trading mechanisms used for financial securities such as clearance, settlement, depository facilities, as well as the auction principles used to discover stock prices. Research on market microstructure focuses on the ways in which the working processes of a market affect determinants of transaction costs, prices, quotes, volume, and trading behavior. A basic premise of market microstructure theory is that asset prices do not need

* Corresponding author. Tel.: +30 210 414 2337.
E-mail addresses: alexakis@unipi.gr (C. Alexakis), a.dasilas@ihu.edu.gr (A. Dasilas), c.grose@ihu.edu.gr (C. Grose).
[1] Tel.: +30 231 080 7544; fax: +30 231 047 4520.
[2] Tel.: +30 231 047 4579; fax: +30 231 047 4520.

1057-5219/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.irfa.2013.02.001

to reflect all available information due to a variety of market frictions such as bid-ask spreads, taxes, transaction costs, etc. Therefore, market microstructure conjectures that under "imperfect" capital markets, significant departure from the assumptions of the efficient market hypothesis is anticipated.

In this context the aim of this paper is twofold. First, it attempts to explore the long-run causality effect between mutual fund flows and stock market prices in the Japanese market, a relatively under-researched developed international market as opposed to US and UK markets. Second, it examines the short- and long-run dynamics between stock index fluctuations and mutual fund inflows and outflows. We employ the hidden cointegration technique along with the crouching error correction models (CECM) to construe the above relations. Hidden cointegration is a nonlinear cointegration which tests whether the impact of positive shocks is separated from the impact of negative shocks. Therefore, hidden cointegration allows us to decode the heterogeneous short-term dynamics that might exist between stock index returns and fund inflows and outflows. For this purpose, we decompose stock index returns based on the direction of change (increases vs. decreases) and we relate these changes to positive or negative fund flows.

We believe that our paper contributes to the ongoing debate on the existence of a feedback process that links mutual fund flows and market returns. We also shed new light to the impact of concurrent and lagged fund flows on market volatility by looking through the aspects of fund investment behavior and taking into account the liquidity of the underlying stocks during periods of market volatility. Finally, the novelty of our paper is the investigation of the market returns–fund flow relation using tools and assumptions from the behavioral and market microstructure finance.

The remainder of this paper is organized as follows: Section 2 presents the pertinent literature. Section 3 describes the structure and the institutional framework that underlines the Japanese fund market. Section 4 describes the data and the methodology used in this study, while section five presents the empirical results. A summary of the main findings and conclusions of this study are offered in the last section.

2. Literature review

The literature that examines the relationship between managed fund flows and stock market returns in the micro and macro levels has gradually revived in recent years. At the micro level, research focuses on comprehending the relationship between same asset class funds and investor clientele. On the other hand, the micro level discussion describes the competition among individual funds for larger market share (Cao, Chang, & Wang, 2008). In line with Ippolito (1992) and Sirri and Tufano (1998), Gharghori, Mudumba, and Veeraraghavan (2007) put forward the so called "smart money effect" whereby fund managers switch flows to funds that are expected to outperform their counterparts, and conclude that fund managers are persistent returns seekers, choosing those funds that continuously attract money flows.

Better future performance can also be expected for small-cap funds expanding their diversification perspective as a result of inflows of funds (Pollet & Wilson, 2008). On the "downside" effects of active stock portfolio reallocations, Coval and Stafford (2007) observe liquidity driven factors to induce financially distressed funds to sell units below their fair values. When testing for a possibly negative price impact on underlying stock prices by liquidity motivated trading, they find compelling results to the affirmative, an impact, however, interestingly mitigated by ensuing insider corporate trading sucking up the unduly sold stocks (Ali, Wei, & Zhou, 2011).

When reviewing the aggregate fund flow effect on stock market returns, the extant literature is rich, especially in recent years. At the macro level, inflows and outflows from specific funds are irrelevant, as "smart money" usually remains invested within the same asset class and aggregate flows are the sole factor worth analyzing with regard to market-wide volatility. Edelen and Warner (2001) find that the macro level impact on market returns stems from the indubitable correlation between fund flows and returns. While confirming the bi-directionality between fund flows and returns, after finding a correlation between previous day returns and present day flows, Edelen and Warner (2001) employ a VAR model using high frequency intraday data and probe deeper into the effects of intraday flows of funds on returns. In contrast to Edelen and Warner (2001), Cao et al. (2008) document no market reaction to flows in late trading. However, a progressively stronger intraday relationship is found, especially when examining outflows, probably due to the fact that fund managers have to meet redeemed units' liquidity requirements, which is not an absolute necessity when dealing with sudden inflows. The above contradiction observed (also in many other country specific studies) does not imply that this research area is void of useful inferences regarding the flow-returns volatility relationship. In this context, Ben-Rephael et al. (2011) examine aggregate daily mutual fund flows in Israel and find that mutual fund investors affect stock market prices. Nonetheless, these investors are lured by the rising equity prices that stimulate them to invest more. The findings of Ben-Rephael et al. (2011) lend support to the price pressure hypothesis according to which stock price deviations, stemming from flows, are reversed within ten trading days. In line with Ben-Rephael et al. (2011), Braverman, Kandel, and Wohl (2005) believe that any stock price impact resulting from net fund flows in the same month is expected to be reversed in the future.

In the same country specific framework, sentiment issues that drive mutual fund flows are highlighted in Ben-Rephael, Kandel, and Wohl (2012) who consider net exchanges,[3] a proxy for reallocations among bond and equity mutual funds, as being correlated with simultaneous stock price changes. Interestingly, bullish sentiment, arising from newsletter recommendations, is also the driving force for aggregate fund flows as documented by Goetzmann and Massa (2003) and Indro (2004). Sentiment factors that drive fund flows include daylight length and ensuing seasonal depression (Kamstra, Kramer, Levi, & Wermers, 2011). Education level and income are also some factors that determine investment decisions regarding mutual fund flows, while trend chasing rather than past performance seeking, seems to influence them as well (Bailey, Kumar, & Ng, 2011).

The Japanese mutual fund market, which is the focus of our paper, is relatively under-explored. Using a sample of weekly fund flows from the Tokyo Stock Exchange, Kamesaka, Nofsinger, and Kawakita (2003) reiterate the commonly held opinion that fund flows in the stock market is a function of money inflows and outflows in mutual funds, thus producing a direct causal relationship between fund flows and stock prices. The absence of market timing elements on the part of fund managers raises the question of whether there exists any association between stock prices and fund units. Sentiment driven irrationalities regarding the Japanese market are first addressed by Brown, Goetzmann, Hiraki, Shiraishi, and Watanabe (2003) who argue that investors exhibit independent sentiments towards the Japanese and U.S. markets and flock into bull and bear funds which are indications of speculative herding. Using a sample of Japanese non open-end funds, Kim and Nofsinger (2005)[4] also detect institutional herding. Cha and Kim (2010) use Granger and Sims causality testing to formulate a unidirectional relationship between fund units and stock prices under conditions of equity volatility, which is seen as both a sentiment driven reaction and a short-run portfolio rebalancing mechanism. However, the relationship between fund flows and equity market returns, as an

[3] They term net exchanges as fund transfers within the same fund family, calculated as "exchanges in" minus "exchanges out", thus summing up to zero for the whole fund family population.

[4] Institutional herding and its impact on stock prices in Japan were first addressed in Iihara, Kato, and Tokunaga (2001).