SHORT-TERM PRICE BEHAVIOR AND THE EFFECT OF FOREIGN INVESTORS IN FINNISH EQUITY MARKETS

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Short-Term Price Behavior and the Effect of Foreign Investors in Finnish Equity Markets

Key words: Short-term underreaction, short-term overreaction, foreign investors, foreign equity flow, price effect, foreign trade execution

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1. INTRODUCTION

For a long time now, academics and investors alike have been interested in market efficiency. This interest is understandable because many financial models are based on the assumption of efficient markets; possible market inefficiencies would open profit opportunities to investors. Because of its academic and economical importance, market efficiency is a significant research area now and will continue to be in the future. In one way or another, a big part of financial research is connected to the assumptions of market efficiency. During the last ten years the number of behavioral finance studies has increased dramatically. The purpose of these behavioral models is to explain why the markets are not efficient, even when it is not entirely obvious that the inefficiencies these inefficiency studies document are economically meaningful in the markets – especially in short-term pricing.

The purpose of this thesis is to contribute to the body of knowledge on short-term under- and overreaction and the short-term effects of foreign investment flow in the small Finnish equity markets. “Short-term” is a relative concept. In the most of previous financial studies “short-term” has meant examination on a daily basis. In the present age of computers and data warehousing, however, it can mean an intraday period. In this thesis, “short-term” means a period from one to five trading days.

The first objective of this project is to study the existence of short-term under- and overreaction based on previous price performance. The second objective is to study whether or not foreign investors’ flow affects the existence of under- and overreaction. The third objective is to contribute to information about how foreign flow affects equity returns in the short-term. The fourth main objective is to compare foreign trade execution to domestic trade execution. These are interesting objectives because under- and overreaction would violate the weak-form efficient market hypothesis. This violation, if shown, would be of interest to both those in the academy and in financial markets. Weak-form efficient market hypothesis tests are one of the first steps to studying inefficiencies in the market. Since globalization and free capital movement have increased so has interest in the effects of that global money flow, especially during financial crises. There has been much discussion concerning the effect of those big faceless foreign flows to small markets. Especially in the short-term, a small market’s
liquidity is forcibly tested, challenging whether or not those foreign flows can cause a deviation from the conditions supposed by the weak-form efficient market hypothesis. The concern has been that large global money flows will affect the pricing of small local markets by causing, in particular, overreaction. Even if the foreign equity flows do not cause under- or overreaction, however, it is possible that those flows will nonetheless affect the local market returns in some other systematic way.

Essay 1 examines the Finnish markets from 1993 to the end of 2000, which is to say until after foreign ownership restrictions were removed. Essays 2, 3 and 4 study the same markets from the beginning of 1995 to the end of May 2000. First, this period in the Finnish equity markets is a good time and place to examine the effect of foreign investors in a small equity market: consider that foreign ownership more than doubles during the examination period, in this period becoming a big part of total daily trading volume. At the beginning of 2000, foreign ownership of all companies listed on the Helsinki Exchange (HEX) was 33.58%. Based on market capitalization that figure is at least twice as much. A second good reason to use Finnish data is the unique central register database of shareholdings for Finnish stocks in the Finnish Central Depository Data Source. This data source makes it possible to quantify the trades between domestic and foreign investors.

During the examination period the number of companies included in the HEX portfolio index doubled – the figure was 101 at the end of 2000. Market capitalization increased from 10 billion to 313 billion euros from the end of 1992 to the end of 2000. This huge market capitalization growth during the examination period is mostly a consequence of Nokia, which was about 71% of the market capitalization of the Helsinki Stock Exchange at the end of 2000.

There is also a negative aspect to using the Finnish data. Results related to the under- and overreaction cannot be generalized as easily as the results of studies made using US market data. Finnish data is not as good as US data because the number of listed companies is small, with a large industry concentration, a big market capitalization dominance of one company (Nokia) and because there are many illiquid stocks in Finland. Considering the unique content of Finnish data, the research problems of this thesis, and advantages and disadvantages after corrections, however, the Finnish market is nonetheless a good place to do this kind of research.
The remainder of this introduction covers factors related to the research area and summarizes the thesis’ most important results. Section 2 covers the definitions and findings of previous under- and overreaction studies. Section 3 covers the most relevant research related to the short-term effects of foreign equity flows and foreign execution. Section 4 briefly covers objectives, methods and the main results of the four attached essays that make up this dissertation. Section 5 summarizes and offers conclusions drawn from the results of the dissertation.

2. SHORT-TERM UNDER- AND OVERREACTION

2.1 Weak-form market efficiency

“Market efficiency” means that all relevant information is already reflected in market prices. If this is the case, market price will change only when new relevant information arrives. New relevant information is unpredictable; otherwise it is not new information. If markets are efficient, market price changes follow a random walk. In efficient markets, market price is the equilibrium price which includes all relevant information available to investors at that time. This equilibrium price is not necessarily the same price as the stock’s future price — in fact, it is most probably not the same price as the stock’s future price. However, according the efficient market hypothesis, the price process from the current equilibrium price to the future price is a random walk process; this means that there are not profits available for the investment strategy, which is based on previous price performance.

According Roberts (1967) there are three different levels in market efficiency. The first level is the weak-form of market efficiency, which means that a current share price includes all relevant information based on its past price performance. Kendal’s (1953) and Working’s (1934) study show early support that share prices really do follow a random walk process and so fill the criteria of weak-form market efficiency. Fama (1965) argues that stock prices follow the random-walk model and that previous price performance can not be used to predict the future price performance. Fama (1970) makes a review of efficiency of capital markets by focusing on previous literature about theory and empirical work. This article covers a different level of market efficiencies and concludes that weak-form market efficiency is strongly supported. About 21 years later Fama (1991) has come to the conclusion that daily and weekly returns are
predictable from the past returns. According to Fama (1991), rational variation through
time in expected returns and/or irrational deviation of the price from fundamental value
can be the cause of price predictability. Fama (1991) concludes that rational variation in
expected returns is caused by shocks to current versus future consumption or by
technology shocks. However, these kind of macrofactors that may effect expected
returns are not as relevant in the short-term (one to five trading days) studies as they are
in the longer-term studies. For example, technological change in the mobile industry,
information technology, and forest and metal industry (which make up a meaningful
component of the stocks listed in the Helsinki Stock Exchange) does not occur during
spans of one night or even one week.

Given the method of how short-term under- and overreaction is examined in this
essay, the obtained results do give some indication for weak-form market efficiency.

2.2 Under- and overreaction

This dissertation attempts to contribute to the short-term under-and overreaction
field of literature that is based on the previous stock price performance. This dissertation
adds to the area of study by examining the effect of foreign investors on short-term
under-and overreaction. Some factors found in the previous studies that might affect the
studied phenomena are reviewed in this section.

One way to study short-term weak-form market efficiency is to study
autocorrelation. In addition to the studies mentioned in Section 2.1, for example, French
and Roll (1986) report positive first order autocorrelation on the individual stocks of
large firms by using daily data from US markets. Otherwise, the autocorrelations of
daily returns of individual stocks are negative, to lag 13. Berglund and Liljeblom (1988)
find positive autocorrelation in Finnish markets. Säfvenblad (1997) uses daily data from
Swedish markets and finds strong positive return autocorrelation for the most liquid
stocks, but Säfvenblad (1997) also finds that less liquid stocks exhibit weak or negative
return autocorrelation because of bid-ask bounce effects for the less liquid stocks. Fama
(1965) reports positive first order autocorrelations for 23 of the 30 Down Jones
Industrial stocks. These autocorrelation studies focus on the predictability of stock
prices and the existence of the random-walk process, but, in general, positive
autocorrelation could be an indication of under-reaction and negative autocorrelation
could be an indication of overreaction. Autocorrelation studies most often concentrate on total market level and also on cross autocorrelations, while there are fewer short-term under- and overreaction studies that focus on the bigger movers like the winner and loser portfolio method does (DeBondt and Thaler (1985)). Of the short-term winner and loser portfolio studies, Ketcher and Jordan’s (1994) results support the argument of overreaction. Ratner and Leal (1998) do not find support for the short-term overreaction hypothesis in emerging markets. Patro and Wu (2001) study daily and weekly index prices in 18 countries and they conclude that buying past winners and selling past losers contributes positive excess return.

Commonly used and tested explanations for possible autocorrelation and under- and overreaction in the short-, medium- and long-term studies are bid-ask spread, company market capitalization, stock valuation, seasonality, risk, unit price, general market performance, extreme returns, and lead lack structure. All these explanatory variables have received at least partial support as explanations of stock price autocorrelation and under- and overreaction in short-, medium- and long-term studies.

The first of the common explanations that have been used in the autocorrelation and under-and overreaction studies is bid-ask spread. Lee et al. (2002), Conrad et al. (1997), Jegadeesh and Titman (1995a), Park (1995), Kaul and Nimalendran (1990), Lehman (1990) and Roll (1984) indicate in their short- and medium-term studies that bid-ask spread is a factor and this is the reason why the bid-ask spread is taken into account in this thesis. But, for a contrasting example, according to Otchere and Chan (2003) bid-ask bounce effect does not generally explain the reversal in the stock prices in the Hong Kong markets.

The second common variable used in the explanation of under- and overreaction is firm size, which gets support from Lee et al. (2002) and Rouwenhorst (1998a and 1998b) and others. Hogan et al. (2004) study US markets by using monthly data and they conclude that momentum and value strategies indicate against market efficiency when the small stock effect is taken into account. Liu et al. (1999) study past winner and loser stocks, in study periods from 3 to 12 months long, and find that the momentum strategy in the UK markets is profitable after controlling for company size. The amount of information and liquidity are two things which are related to the firm size. According to Daniel and Titman (2000) and Hong et al. (1998) momentum effect is strongest in
stocks for which there is the least information available. Analyst coverage (and thus information) is scarce for small companies due to the fixed cost of analyzing such companies. The size of the company also affects the liquidity and market efficiency of stock prices because market making and arbitrage is less in small-cap stocks (Merton (1987) and Grossman and Miller (1988)). This is a consequence of the fact that market making and arbitrage positions are riskier the worse the liquidity of the stock. Zarowin (1990) argues that size effect is not as relevant in short-term overreaction as it is in long term overreaction. Instead of studying market capitalization, this essay examines volume effect. Connolly and Stivers (2003) find substantial momentum (reversal) in consecutive weekly stock returns when the latter week has unexpectedly high (low) turnover. Using monthly data, Lee and Swaminathan (2000) indicate that past volume indicates magnitude and persistence of price momentum and that trading volumes are not liquidity proxy. Stocks with high (low) past turnover rations earn lower (higher) future returns.

The third commonly used explanation for the under- and overreaction effect is the stock’s valuation. Based on Daniel and Titman (2000) and Hong et al. (1998), the momentum effect is strongest in stocks for which there is less information available or when the information is ambiguous. For example, the valuation of technology stocks is mostly based on future expectations. Because there is less information available about the future and this information is often ambiguous, there should be more momentum in technology stocks. Wermers (1999) finds empirically that there is more herding of small and growth-stock oriented funds. The company valuation itself is not a focus area of this thesis, however.

The fourth common explanation is seasonality. Odgen (2003) reports that the bulk of annual mean excess returns on US stock and bond portfolios is realized in October through March. Mun et al. (1999) report short-term contrarian profits without significant January effect in Germany and France by using monthly data. Jegadeesh (1990) finds in his serial correlation study that extreme decline portfolio returns are higher in January than in other months. De Bondt and Thaler (1987) indicate the same kind of results. According to Bremer and Sweeney (1991) market reversal phenomenon is unrelated to the January and Monday effects. Zarowin (1990) does not find that overreaction effect is driven by January returns. Keim (1983) indicates that daily
abnormal returns in January have larger means relative to other months. The monthly and daily effects are studied in this thesis.

Ang et al. (2001) report that downside risk is an important factor for explaining the cross section of expected returns. Mun et al. (1999) report that short-term contrarian profits are not correlated with higher risk. Chang et al. (1995) find short-term contrarian profits after taking into account systematic risk. Chan et al. (1996) find that winner and loser portfolios have very similar market risk exposures. According to Daniel and Titman (2000) and Jegadeesh and Titman (1993), abnormal returns are not based on systematic risk. Rouwenhorst (1998a) finds that winners outperform losers after risk is corrected for. According to Fama (1991), market efficiency tests are joint tests for behaviour of returns and market models. In discussion with Fama, (Fama (1970)), William Sharpe lists many factors which might affect the risk measure of a market model and might reveal how good that market model is. In Finnish markets there are many small companies and, furthermore, Fama (1998) argues that anomalies found in small companies might simply be a result of a bad model. Finally, Brown and Warner (1985) argue that the market-adjusted excess return will exhibit a similar ability to detect abnormal performance as the excess return based on a market model. Given these three reasons, this study does not use the market model — instead, market adjusted returns are studied. But other risk factors that might be critical in the short term and especially when illiquid stocks are taken into account. The factors which are taken account and which might be related to liquidity are bid-ask spread, market volumes and unit price.

Baytas and Cakici (1999) find that low-price portfolios consistently out-perform the market, while high price portfolios under-perform the market. Ball et al. (1995) report that much of the contrarian profits they find are driven by low price loser stocks, but according Bowman and Iverson (1998) low price loser stocks are not the reason for overreaction in the New Zealand markets. This essay examines the effect of stock unit price.

Cooper et al. (2004) indicates that momentum profit depends upon the state of the markets; the momentum profits increase as the lagged market returns increase. Chan (1993) predicts higher return autocorrelation after high absolute market return. This
essay examines whether or not the HEX-portfolio index return affects possible under- and overreaction.

Brown and Harlow (1988) report that the most extreme winner and loser stocks exhibit the biggest subsequent price reversals. How big changes in the returns affect possible under- and overreaction is also studied in this essay.

Lo and MacKinlay (1990) argue in their weekly lead-lag structure study against overreaction as the only source of contrarian profits. Jegadeesh and Titman (1995) argue that the average cross-serial covariance used by Lo and MacKinlay (1990) may be a misleading measure of contribution of the lead-lag structure to the profitability of contrarian strategy. Cross serial covariance as a measure of lead-lag structure, as used by Lo and MacKinlay (1990) is contested by Jegadeesh and Titman (1995b). Jegadeesh and Titman find that lead-lag structure contributes little to contrarian profits, while stock prices overreact to firm-specific information rather than to the lead-lag structure. Because of this, the lead-lag structure examination is not included in this dissertation.

3. FOREIGN EQUITY FLOW AND EXECUTION

3.1 Foreign equity flow

There are many studies which report that foreign investors’ equity flows are strongly influenced by past returns and that foreign investors tend to buy past winner stock and sell past loser stocks (e.g. Dahlquist and Robertsson (2004), Karolyi (2002) and Kim and Wei (2002)). Froot et al. (2001) report that international portfolio flows are strongly influenced by past returns, which is consistent with positive-feedback trading by international investors. Grinblatt and Keloharju’s (2000) results indicate that foreign investors tend to be momentum investors, buying past winner stocks and selling past loser stocks. Choe et al. (1999) report positive-feedback trading and herding by foreign investors before the period of Korea’s economics crisis. During the crisis period, herding fell and positive-feedback trading by foreign investors mostly disappeared in Korea. Brennan and Cao (1997) conclude that investors tend to purchase foreign assets in periods when the returns on foreign assets are high and sell when the returns are low. This kind of behavior can cause a momentum effect on stock prices. A natural consequence of foreign investors’ momentum and positive feedback trading could be underreaction indication in the stock prices. However, it is also possible that big herding
and momentum trading might push share prices too far up or down because of possible short-term imbalances in the supply and demand of stocks by causing overreaction indication. Short-term under- and overreaction and the effect of foreign investors is the central theme of the second essay in this dissertation.

There is indication that foreign equity flows will affect the local returns: Dahlquist and Robertsson (2004) report that foreign net purchases are associated with permanent price increases. Froot et al. (2001) find that foreign inflows have a statistically significant positive forecasting power for future equity returns in emerging markets. Local stock prices are sensitive to foreign inflows. The majority of price increases do not occur over a short period of time, such as a few days. According Clark and Berko (1997), in Mexico during 1989-1996 the unexpected foreign inflow of 1% of market capitalization drove prices up by 13%. According Stulz (1999), there is no convincing evidence that portfolio flows increase the volatility of equity returns, lead to excessive co-movement of a country's returns with world equity returns, or destabilize security markets. Tesar and Werner (1995) do not find a relationship between the volume of U.S. transactions in foreign equity and the local turnover rates or volatility of stock returns. Based on the studies mentioned in this paragraph, there is indication that foreign flows will affect the returns of local markets. How the foreign investors will affect the short-term performance is the central them of this dissertation’s Essay 3. The studies above concentrate on longer periods than this study does. But because liquidity might be an issue at least in the short-term, the same phenomenon is expected to be found in short-term price behavior when foreign investors are active.

The following are three explanations of the price effect of foreign investors: (1) that domestic investors are better informed than foreign investors, (2) that foreign investors initiate an institutional effect and (3) that the influx of foreign investors into the local market creates bigger risk sharing.

Dahlquist and Robertsson (2004) report that there is very little evidence that share price performance is related to foreign informed trading. According to Brennan and Cao (1997), domestic investors posses a cumulative information advantage over foreign investors. Shukla and Van Inwegen (1995) find support for this information advantage hypothesis in their study, in which investments of UK mutual funds in the US market perform poorer than US domestic funds. They conclude that information
disadvantage and fund size contribute to this poor performance. Frankel and Schmukler (1996) show that during the Mexican crisis domestic investors reacted before international investors to the news about the Mexican economy. The authors interpreted this finding in two ways: either domestic and international investors received two different sets of information or the local investors were more alert and sensitive to potential warning signals. Kang and Stulz (1997) report that foreign investments in Japanese equities are concentrated in large firms, which is consistent with foreign investors having relatively less information about small firms. All of these results indicate that the lack of information compared to domestic investors is a critical thing when investors make foreign investments. In contrast with the studies mentioned above, Froot and Ramadorai (2001) report that the forecasting power of international portfolio flows is due predominately to information and is only slightly due to price pressure in the foreign market. They argue that investors who are behind those international portfolio flows have better information than domestic investors. If it is assumed that foreign investors do not have the advantage of cumulative information, as do domestic investors, their focus may be limited to short-term. This can cause foreign investors to be more momentum-oriented. The information differences and effect of those differences between foreign and domestic investors are not studied in this dissertation.

Bonser-Neal et al. (2004) report that it is liquidity demand rather than nationality that determines the price impact. According to them, foreign investors are liquidity demanders. Chiyachantana et al. (2004) find in their international institutional study that it is the symmetry between institutional buy and sell orders that determines price impact. Institutional effect as such is not studied in this dissertation, but the effect of foreign flows has been used as an explanation for price effect throughout the essays of this dissertation, assuming that foreign flow in Finland is mainly institutional flow. Donhue and Froot (2002) and Froot and Tjornhom (2002) indicate that foreign flows are persistent from one period to another. The short-term persistence of foreign flow is studied in Essay 3.

Dahlquist and Robertsson (2004) and Clark and Berko (1997) indicate that bigger risk sharing is one factor behind the price performance of foreign flow. This bigger risk sharing argument, and, furthermore, company specific factors are not
included in this study in order to keep it focused more upon the foreign flow effect and on market microstructure issues, such as bid-ask spread, unit price, and market volumes.

### 3.2 Foreign execution

In Finland foreign investors are mainly institutions. In general individuals make fewer direct investments in foreign equity markets — instead, for foreign diversification they use mutual funds. There is some indication that institutional flows can cause price pressure (Sias (1997), Chan and Lakonishok (1993), Chan and Lakonishok (1995)). Grinblatt and Keloharju (2000) argue that foreign investors use momentum strategy in Finnish markets. Based on the above and on articles cited earlier in this introduction one can speculate that foreign investors are momentum-oriented and might cause some price pressure in the Finnish market. There are participants in the Finnish market who are better informed about foreign order flow than others. These participants are mostly domestic brokerage dealers, who might also practice dual trading and front-running. Most probably domestic brokerage dealers are more hesitant to front-run their own orders than they are willing to front-run other brokerage dealer orders, which in some cases they can anticipate based on their superior information about active market parties in the Finnish equity markets and in other cases even based on the brokerage code. The logical consequence of dual trading and the front-running of foreign orders is that foreign execution during the day is worse than domestic execution. Choe et al. (2004) find that foreign investors pay more than domestic investors when they buy shares and get less when they sell shares and that this happens only in the medium and large trades. They do not find that foreign investors are more impatient or better informed than domestic investors, but they do find that prices tend to move more against foreign investors before they trade intensively. Fishman and Longstaff (1992) find in their dual trading study that front-running leads to higher before-commission-expected-trading profits for customers than if broker does not front run. Sarkar (1995), Pagano and Röell (1993) and Röell (1990) find that front-running hurts informed traders. This dissertation does not actually study whether or not foreign investors are informed, but it does argue that foreign flows drive share prices (Essay 3) in the Finnish market and, in that sense, from the Finnish-registered domestic brokerage house’s front-running point of view those foreign orders are more interesting than domestic orders.
Another factor which might affect the foreign execution return is the indication that foreign investors are liquidity demanders, such as Lee et al. (2004) and Bonser-Neal et al. (2004) suggest. This liquidity demand can lead to behavior in which foreign investors hit more often on the ask side of the bid-ask spread when they are buying and on the bid side of the bid-ask spread when they are selling, instead of waiting for the execution on the other side of the bid-ask spread. Possible dual trading, front-running and the liquidity demand of foreign investors are factors that lead one to expect that foreign execution is worse than domestic. Foreign execution return is the research area of Essay 4.

4. SUMMARIES OF ESSAYS’ OBJECTIVES, METHODS, AND MAIN RESULTS

Essay 1

In Essay 1 the main objective is to study whether or not short-term under- and overreaction exists in the small Finnish markets, from 1993 to the end of year 2000, especially in those portfolios where the change of share price has been big.

In Essay 1 stocks are divided into the winner and loser portfolios based on the previous price (formation period) performance. The examination period varies from one to five trading days. The portfolio that includes the best performing stocks is called the “winner portfolio” and the portfolio that includes the worst performing stocks is called the “loser portfolio. The interpretation of overreaction (underreaction) is based on the portfolio’s performance in the formation period and test period (the period after the formation period). For example: if a portfolio out-performs (underperforms) the HEX-portfolio index in the formation period and underperforms (underperforms) the HEX-portfolio index in the test period it is indication of overreaction (underreaction). This essay also examine how bid-ask spread, a stock’s unit price, market activity, magnitude of previous period return, index return, and seasonality affects possible short-term under- and overreaction.

Essay 1 reports overreaction for one-to-four-trading-days in the loser portfolio and in September winner portfolio based on the closing prices. In the winner portfolio underreaction is indicated in January and February based on the closing prices. After controlling for the bid-ask bounce effect, reported in Roll (1984), overreaction
indication disappears, but February underreaction in the winner portfolio is still indicated. There are many studies which are in accordance with the results of Essay 1 — that bid-ask spread is a factor in the case of overreaction indication. Conrad et al. (1997) use weekly returns on NASDAQ and NYSE/AMEX securities and find that contrarian profit is largely generated by the bid-ask bounce effect and that there are no contrarian profits after taking into account trading commissions. According to Jegadeesh and Titman (1995a) bid-ask spread explains much short-term return reversal. Cox and Peterson (1994), who report that stock returns following large one-day price declines can be explained by bid-ask bounce and low market liquidity. Bremer et al. (1991) and Park (1995) find a statistically significant reversal in the stock prices, but those reversals do not represent a profitable trading strategy because of the high bid-ask spread. Kaul and Nimalendran (1990) find little evidence about overreaction in the NASDAQ markets after controlling for bid-ask spread. There are also papers that find overreaction indication after taking into account bid-ask spread. Using weekly data, Lee et al. (2002) and Lehman (1990) assert that bid-ask spread does not fully explain the contrarian effect. Atkins and Dyl (1990) report that overreaction related to big price decline is not a consequence of the bid-ask bounce effect, even though the bid-ask spread is big compared to the magnitude of the overreaction. Most of above research papers are in accordance with the results of Essay 1.

Based on real market prices, not calculated mid-prices (used in calculation to eliminate the bid-ask bounce effect), overreaction indication exists in the loser portfolio. The overreaction indication is not statistically significant on Fridays. The overreaction indication is larger when the underperformance is bigger, the negative index change is bigger, the mid-spread (higher bid-ask bounce) is bigger, or the turnover and unit price during the formation period is higher. According to Ball et al. (1995), loser stocks are low-price stocks. The data analysis of Essay 1 indicates that the biggest overreaction indication happens in the high-price loser portfolios, which is partly consistent with Bowman and Iverson (1998), who find that low price loser stock is not reason for overreaction. Hameed and Ting (2000) find that frequently and heavily traded securities tend to earn substantially higher contrarian profits than low trading activity stocks which are findings in accordance with the results of Essay 1. In the winner portfolio,
market activity positively affects under- and overreaction indication when closing prices are used.

Under- and overreaction indication found is this study are not big enough to argue against the weak-form efficient market hypothesis.

**Essay 2**

The main objective of Essay 2 is to determine whether or not foreign investors affect the under- and overreaction indication and in that sense have a market-destabilizing effect.

Essay 2 uses a winner-loser portfolio method, from 1995 to May 2000. The examination period varies from one to five trading days. There are two different winner and loser portfolios: one for those stocks where domestic investors have been net buyers and one for those stocks where the foreign investors have been net buyers.

In Essay 2 foreign net equity flows (e.g. Dahlquist and Robertsson (2004), Froot et al. (2001), Clark and Berko (1997)) and possible foreign momentum investing (e.g. Dahlquist and Robertsson (2004), Karolyi (2002), Kim and Wei (2002), Grinblatt and Keloharju (2000)) do not contribute enough under-and overreaction in the domestic and foreign-buy-portfolios that they would support an argument against weak-form market efficiency when the bid-ask bounce effect is also taken into account. The major results of Essay 2, therefore, are in accordance with Stulz (1999) and Choe et al. (1999) who find that foreign investors do not have a market-destabilizing effect.

Essay 2, furthermore, makes the following minor points. There is more indication of under- and overreaction in the domestic buy winner and loser portfolios than in the foreign buy portfolios. The data suggests some weekday effect in the domestic buy portfolios. On Tuesday there is underreaction in the domestic buy winner portfolio and on Monday there is overreaction in the domestic buy loser portfolio, but when dummy regression is used these results are not statically significant any longer. There is underreaction indication in both domestic- and foreign buy winner portfolios in January and only in the foreign buy winner portfolio in February, but when dummy regression is used these results are no longer statically significant at 5 % significance level.

There is underreaction indication in the domestic buy winner portfolio and overreaction in the domestic buy loser portfolio in the small HEX index change. Market
activity such as Hameed and Ting (2000) indicate and the formation period return such as Brown and Harlow (1988), Bowman and Iverson (1998) and Bremer and Sweeney (1991) indicate do not affect in any consistent manner the under- and overreaction in the domestic- and foreign-buy-portfolios.

Based on the comparison of performance between domestic- and foreign-buy-winner portfolios, the bigger the domestic buying (foreign selling) is in the formation period, the bigger the domestic buy portfolio out-performance is in the test period compared to the foreign buy portfolio. The same kind of results cannot be found for the loser portfolios. In some periods the positive HEX portfolio-index return in the formation period will positively affect the domestic buy winner portfolio out-performance during the test period and negatively affect the domestic buy loser portfolio out-performance in the test period.

**Essay 3**

The main objective of Essay 3 is to focus on foreign equity flows from 1995 to May 2000 and examine how foreign equity flow affects short-term (from one to five trading days) price changes in the small Finnish equity markets. Essay 3 examines the foreign flow effect by studying two different portfolios: foreign buy and sell portfolios. The foreign buy (sell) portfolio is defined as when foreign investors have been net buyer (sellers) during the formation period.

When foreign investors are net buyers there is a positive market-adjusted return and when foreign investors are net sellers there is a negative market-adjusted return. These results are in accordance with medium term studies (Dahlquist and Robertsson (2004), Bekaert et al. (2002), Froot et al. (2001), Froot and Ramadorai (2001), and Clark and Berko (1997)).

Essay 3 finds that the bigger the foreign net buying is, the bigger the market-adjusted return is. The bigger the foreign net selling is, the more negative the market-adjusted return is. These findings indicate price pressure when foreign investors are buying and selling. Big institutions are those that generally have recourse for global diversification and this is why, perhaps, it could be correct to assume that the biggest part of foreign equity flow in Finland is coming from institutions rather than individuals. If this is the case, both foreign and (as exemplified by Bonser-Neal et al.
(2004) and Chiyachantana et al. (2004)) institutional effect both might be involved in
the results of Essay 3.

A third key finding of Essay 3 is that foreign equity flows are persistent from
5% to 21% and statistically significant when foreign investors are net buyers. This result
is accordance with Froot and Tjornhom (2002) finding that foreign flows are persistent
at about a 10 to 20% level in developed markets. For emerging markets, Donohue and
Froot (2002) have reported about 40% persistence levels for foreign flows.

Essay 4

Essay 4 studies foreign trade execution by studying foreign buying, selling and
net executions during the continuous trading in all stocks that belong in the HEX-

Results show that foreign buying and selling execution is poorer than domestic
execution. The foreign net execution (which includes intraday trading) is also loss
making. The bigger foreign relative volumes are, the poorer is foreign execution. These
results are in accordance with Choe et al. (2004) who find that foreign investors pay
more than domestic investors when they buy shares and get less when they sell shares
and that this happens only in the medium and large trades. They do not find that foreign
investors are more impatient than domestic investors, but they do find that prices tend to
move more against foreign investors before they trade intensively. The amount foreign
investors lose in the execution studied in Essay 4 is, from an economic point of view, so
small when compared to the brokerage commission for foreign investors (from 0.05 –
0.3%) that it should not be a significant issue.

Literature which possibly supports poorer foreign execution are Lee et al. (2004)
and Bonser-Neal et al. (2004), who argue that foreign investors are liquidity demanders;
and dual trading and front-running literature (Sarkar (1995), Pagano and Röell (1993),
Fishman and Longstaff (1992), and Röell (1990)). When there is a meaningfully sized
market order there is a big risk that the brokerage house’s trading books and market-
makers, who can anticipate the size of the order based on their better information about
active market parties in the Finnish market and their better knowledge about execution
strategies of those active market parties, will front run an order. This front running
causes the share price to move further in the same direction when compared to the
movement caused by the large foreign order alone. Brokerage exchange codes related to
the individual brokerage dealer make this anticipation even easier; even individual brokerage dialers inside the house might sometimes exchange the codes between individual brokerage dealers in-house in order to confuse the market. That foreign investors are liquidity demanders might lead to execution instructions that cause execution more often on the “wrong” side of the bid-ask spread and in that way cause foreign execution to be worse than domestic execution.

5. CONCLUSIONS

There is no economically meaningful short-term under- and overreaction found in the Finnish markets. This finding is in accordance with Fama (1970), in which he reviews the efficiency of capital markets by focusing on theoretical and empirical literature. The Fama (1970) article covers a different level of market efficiencies and concludes that weak-form market efficiency is strongly supported. About 21 years later Fama (1991) comes to conclusion that daily and weekly returns are predictable from past returns. This dissertation also finds some indication of predictability in the winner and loser portfolio returns, especially based on closing prices, but this indication almost disappears when the bid-ask spread is taken into account. These results support previous literature that indicate that bid-ask spread is a factor in the under- and overreaction studies (e.g. Jegadeesh and Titman (1995a), Park (1995), Cox and Peterson (1994), Bremer et al. (1991), Kaul and Nimalendran (1990)). Lee et al. (2002) and Lehman (1990) use weekly data and according to them bid-ask spread does not fully explain the contrarian effect. Atkins and Dyl (1990) report that overreaction related to big price decline is not a consequence of the bid-ask bounce effect, even though the bid-ask spread is big compared to the magnitude of the overreaction.

Based on the under- and overreaction examination in the domestic and foreign winner and loser portfolios, foreign investors do not destabilize markets in the short-term, even though studies on the effects of the foreign equity flows (e.g. Dahlquist and Robertsson (2004), Froot et al. (2001), Clark and Berko (1997)) and possible foreign momentum investing (e.g. Dahlquist and Robertsson (2004), Karolyi (2002), Kim and Wei (2002), Grinblatt and Keloharju (2000)) could create this kind of expectation. The results of Essay 2 results in are accordance with Stulz (1999) and Choe et al. (1999) who find that foreign investors do not have destabilizing effect in the markets.
Foreign activity affects short-term equity returns. When foreign investors are net buyers there is a positive market-adjusted return and when foreign investors are net sellers there is a negative market-adjusted return. These results are in accordance with the following medium term studies: Dahlquist and Robertsson (2004), Bekaert et al. (2002), Froot et al. (2001), Froot and Ramadorai (2001), and Clark and Berko (1997). The bigger the foreign net buying (selling) is, the bigger (more negative) is the market-adjusted return. These findings indicate price pressure when foreign investors are buying and selling. Essay 3 does not separate whether this price pressure is dependent on nationality or it is an institutional effect as Neal et al. (2004) and Chiyachantana et al. (2004) indicate, or whether it is both. Foreign equity flows are persistent from 5 to 21 % and statistically significant when foreign investors are net buyers. This result is in accordance with Froot and Tjornhom’s (2002) finding that foreign flows are persistent at about a 10 to 20 % level in developed markets. For emerging markets, Donohue and Froot (2002) have reported about 40 % persistence levels for foreign flows.

Literature that indicates foreign investors are liquidity demanders (such as Lee et al. (2004) and Bonser-Neal et al. (2004)) and indicates possible dual trading and front-running (such as Sarkar (1995), Pagano and Röell (1993), Fishman and Longstaff (1992), and Röell (1990)) creates expectations that foreign execution could be worse than domestic execution. This dissertation indicates that this is the case, but the magnitude of foreign loss in the execution is so small that it should not be an issue.

There are many other statistically significant results in the essays that indicate that returns can, at some level, be predicted — but when all corrections and economic meaning is taken account these results are no longer interesting.

From the point of view of market practice, the following findings are relevant:
(1) Economically meaningful short-term under- and overreaction does not exist in the Finnish market, based on the previous short-term price performance in the winner and loser portfolios. Of course there is occasional short-term under- and overreaction with and without foreign investors in certain stocks and certain periods, but when more stocks are included in the longer period those indications even up and under- and overreaction is no longer indicated. (2) Foreign investors do drive share prices in the short-term, but the applied-market problem is how to predict what stock foreign
investors are going to buy and sell. (Foreign short-term equity flows seem to be persistent from 5 to 20%.) (3) Foreign investors do not destabilize markets in the short-term; even if foreign net buying or net selling is cooling down, the price effect for this foreign net buying and selling seems to be permanent, at least in the short-term. (4) Foreign daily trading execution is worse than domestic execution, but not so much that it should be an issue.
6. REFERENCES


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