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The Predictability of Short-Horizon Stock Returns

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Abstract. This examines the predictability of short-horizon stock returns in the UK. We show that the subsequent return reversal of previous extreme performers is unlikely to be caused by either lead-lag effects or inventory imbalances, the most likely explanation being market overreaction. A market or trading based explanation is reinforced by the finding that these return reversals are asymmetric, being less significant after bad news. Further, we find that the lower transacting stocks exhibit the stronger return reversals, in direct contrast to both the existing US evidence and the implication that liquidity effects can explain the return reversals.

Keywords: Contrarian strategies, market overreaction, return predictability.

JEL Classifications: G10, G11, G12

The investigation of the time series properties of returns and their predictability has been a popular means of examining market efficiency. Evidence from the US has indicated that short-horizon stock returns appear to be negatively autocorrelated.[1] There are two approaches to explaining the meaning of this return predictability. On the one hand, the evidence has been taken to indicate that there may be systematic movements in prices or returns as a result of irrational trading behaviour. Specifically, investors overreact, resulting in a subsequent correction that generates negative autocorrelation. The alternate view is that markets, and the participants trading within them, process information rationally. Evidence of return predictability is therefore a result of market frictions. The aim of this paper is to investigate short-horizon stock return predictability in the UK. In doing so, we aim to distinguish between the competing views regarding this apparent predictability.

1. Return Predictability

There has been consistent empirical evidence of the predictability of US short-horizon returns as demonstrated by the profitability of the contrarian trading strategies employed in Jegadeesh (1990) and Lehmann (1990). The suggestion that this means stock markets overreact has been questioned by Lo and MacKinlay (1990a). They calculate that cross-serial correlations (in terms of a systematic lead-

[1] Fama (1965), French and Roll (1986), Lo and MacKinlay (1988) and Conrad et al. (1991).

lag relationship between large and small stock weekly returns) account for almost 50 percent of expected contrarian profits. Therefore, even if individual stock returns are serially independent, selling winners and buying losers might be profitable purely as a result of positive cross-serial correlation. This is supported by Conrad and Kaul (1998), who demonstrate that the profitability of a weekly contrarian strategy is determined by a combination of cross-serial covariances and autocovariances. If such positive cross-serial correlation is induced by nonsynchronous trading, then abnormal returns could not be realised. Alternatively, a lead-lag effect would imply return predictability only for the smaller stocks.

There is little evidence to suggest that nontrading has a significant practical impact on the findings of positive cross-serial correlations. Lo and MacKinlay (1990b) conclude that the degree of nontrading required is unrealistic, while McQueen et al. (1996) find that nontrading could account for only a small portion of the cross-autocorrelations.

The importance of cross effects has been disputed by Boudoukh et al. (1994). They argue that cross-serial correlation may be a result of the lagged large firm returns simply proxying the lagged small firm returns. The asymmetric relation arises from the greater degree of autocorrelation among the smaller firms; i.e., cross effects are a result of the combination of autocorrelation and the contemporaneous correlation between portfolios. Alternatively, Badrinath et al. (1995) argue the lead-lag effect may indicate a process of information transmission between institutionally favoured and institutionally unfavoured firms, consistent with, for example information set-up costs.[2] They find that a lead-lag effect, based on institutional ownership, persists after controlling for firm size.[3] However, this process of information transmission has been disputed by McQueen et al., who find that the delay appears to be marginally greater among institutionally favoured stocks.[4] McQueen et al. further observe that there is a greater lag between large and small stock returns in up than in down markets. This directional asymmetry may be based on the possibility that, when news is bad, both large and small stocks can be sold equally quickly, whereas when news is good, it takes longer to determine which of the smaller stocks to buy.

An alternate viewpoint is that of Jegadeesh and Titman (1995a), who decompose the profits from a contrarian strategy into price reactions to firm specific information and common factors. They show that stock prices reacted with a delay to common factors, but overreacted to firm specific information. While differences in the delay to the common factors results in a lead-lag effect, it is overreaction

[2] Investors in institutionally unfavoured stocks are able to free ride on the information gathered by institutional investors, although at a lag.

[3] Including own lagged returns in their regression analyses did not influence their findings that the returns on portfolios with low institutional ownership lagged those with high levels by as much as two months, a longer lag than that documented for the size based portfolios.

[4] A better proxy of information gathering may be the number of analysts following a particular firm. There is some evidence that stocks followed by a larger number of analysts react more quickly to common information (see Brennan et al. (1993)).

to firm specific information rather than delayed reaction to common factors that drives the contrarian profits.[5]

This article presents further evidence on the predictability of short-horizon stock returns by examining the profitability of short-term contrarian trading strategies in the UK. Not only does such research shed light on the predictability of stock returns, but it also allows us to control for some of the explanations offered above with regard to this predictability. Our aim therefore is to minimise the potential effects of measurement and microstructure-induced biases. More importantly, we seek to overcome the difficulty of distinguishing between the relative importance of own and cross effects. One of the drawbacks of the above studies is that they examine the returns to a contrarian investment strategy incorporating a wide cross-section of available firms. This means that the presence of a lead-lag effect between different classes of firms makes it difficult to distinguish either the cause or relevance of a profitable contrarian strategy.

2. Empirical Analysis

In order to distinguish between some of the alternative explanations for the profitability of a contrarian investment strategy, our analysis below uses returns computed from mid-spread closing prices. This should ensure that the affect of a measurement bias, resulting from the bid-ask spread, is minimised. Secondly, we confine ourselves to those stocks that are components of the FTSE 100 Index. At any point in time, our trading strategy has a selection of just one hundred stocks to choose from. This means that we are examining a relatively small subset of the stocks listed on the London Stock Exchange. Not only does this minimise the impact of small firms and related microstructure-induced biases (such as inventory imbalances), but it also reduces the possibility that evidence of return reversals can be explained by a lead-lag effect, whether this is between large and small stocks, institutionally favoured and unfavoured stocks or as the result of a process of lagged adjustment consistent with the analysis and incorporation of information.[6] A profitable contrarian strategy based on the FTSE 100 would imply return predictability as a result of return reversals. Not only would such evidence for this sample of stocks be more interesting economically,[7] but the replication of such a strategy would also be more feasible.[8]

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[5] Jegadeesh and Titman (1995b) consider the possibility that these return reversals are not caused by the correction of an initial overreaction but are due to the specialists' inventory imbalances. They argue that contrarian profits are compensation for bearing inventory risk, and support this with their finding of an increased negative serial covariance at times of increased volume.

[6] This will also avoid the impact of survivorship bias.

[7] Although a relatively small sample, the FTSE 100 represents approximately two-thirds of total market capitalisation, while foreign investors have approximately three-quarters of their UK funds invested in FTSE 100 stocks.

[8] Knez and Ready (1996) have questioned whether a trading strategy employed to take advantage of the predictability of short-horizon stock returns as implied by a lead-lag effect between large and

The data used in the analysis comprise the constituents of the FTSE 100 Index between January 1988 and October 1997, and was obtained from Datastream. The choice of period coincides approximately with the use of screen trading by competitive market makers in the UK. This system was introduced in October 1986 and replaced by an electronic trading system in October 1997. Our analysis starts from 1988 because of data unreliability prior to the end of 1987. During this period a total of 176 firms (excluding name changes etc.) have been constituents of the index. Weekly returns are calculated from Wednesday closing prices, and are adjusted for dividends.[9] Each week, the one hundred constituents of the index are ranked on the basis of their returns over the previous one and two weeks (a one week and two week strategy respectively). Firms with missing returns are excluded from that particular ranking (e.g., new issues). Winners are those stocks with the highest past returns, losers are those with the lowest. Two portfolios are formed for each ranking, comprising the decile of extreme stocks, (i.e., ten winners and ten losers respectively). The equally weighted returns to these four portfolios are measured over the following six weeks. Rather than measure the holding period return, we calculate the return to the portfolio during each particular week after portfolio formation in order to examine the performance of the portfolios over time. The returns illustrated represent the return on $1, invested equally between the stocks in each portfolio. The difference between the return to the loser and winner portfolio represents the return to a zero cost arbitrage portfolio (in terms of net investment). This arbitrage return does not incorporate transaction costs. It has been estimated that commission charges for institutional investors in the UK were approximately 0.16% during 1995.[10] The cost of the spread is more difficult to estimate given that the effective spread will normally lie well within the quoted spread. This effective spread is negotiable and depends on the size of the transaction together with factors such as the market makers' positions. Naik and Yadav (1999) have recently estimated that the average effective spread for trades in FTSE 100 stocks during 1996 was 16 basis points.[11]

For each strategy, we obtain a sample of 504 weekly returns. The winner returns are denoted W, the losers L. We test the significance of these portfolios relative to an equally weighted portfolio of 100 stocks. Since the analysis yields loser (L) returns that are generally greater than winner (W) returns, we test the significance of a zero cost strategy based on buying the losers and selling the winners, i.e., whether $L - W$ is significantly different from zero. Table I gives the mean weekly portfolio returns based on both a one and two week portfolio formation period. It

small firms would be profitable, given the size of the effective spread for the smallest 20 percent of firms.

[9] The use of Wednesday closing prices is a standard methodology. Similar results were obtained using Tuesday and Thursday closing prices.

[10] See The London Stock Exchange Quality of Markets Review (1996).

[11] This is in line with Petersen and Fialkowski (1994), who found an effective spread of 0.19% for large stock trades on various US exchanges.

Table I. Mean weekly returns to winner, loser and arbitrage portfolios

	One week strategy			Two week strategy		
	W	*L*	*L* − *W*	*W*	*L*	*L* − *W*
Wk 1	−0.0027	0.0060	0.0087	−0.0024	0.0058	0.0082
	[−4.57]	[3.35]	[9.47]	[−4.78]	[3.25]	[8.77]
Wk 2	0.0007	0.0024	0.0017	0.0003	0.0027	0.0024
	[−1.39]	[0.28]	[1.93]	[−1.77]	[0.53]	[2.67]
Wk 3	0.0006	0.0034	0.0028	0.0010	0.0024	0.0014
	[−1.45]	[1.14]	[3.55]	[−1.20]	[0.22]	[1.59]
Wk 4	0.0024	0.0016	−0.0008	0.0027	0.0012	−0.0015
	[0.20]	[−0.46]	[−0.84]	[0.50]	[-0.85]	[−1.72]
Wk 5	0.0033	0.0007	−0.0026	0.0027	0.0010	−0.0017
	[0.94]	[−1.37]	[−3.17]	[0.40]	[−1.06]	[−1.86]
Wk 6	0.0024	0.0024	0	0.0021	0.0012	−0.0009
	[0.17]	[0.13]	[0.00]	[−0.14]	[−0.85]	[−1.03]
MV	0.95	0.88		0.97	0.84	

Portfolios consist of winners *W*, losers *L* and a zero cost arbitrage strategy *L* − *W*. Stocks are assigned to these portfolios according to their performance over the previous one or two week periods (one week strategy and two week strategy). Wk 1 ... 6 represent the return accruing during the first ... sixth week after portfolio formation. MV denotes the market value of the respective portfolios as a proportion of the average market value of the constituents of the FTSE 100 Index.

The *t*-statistics, testing the significance of the returns on the winner and loser portfolios from the return on the equally weighted index, and the return on the zero cost arbitrage portfolio from zero, are reported in brackets. The *t*-statistics are computed from standard errors calculated using Newey–West corrections with four lags.

is apparent that there is little difference between the subsequent performance of the portfolios formed on the basis of either of these formation periods. Both the winner and loser portfolios exhibit significant return reversals during the first week after formation. This return reversal is strongest for the winners. The resulting return to a zero cost arbitrage strategy (based on buying the ten worst performers and selling the ten best performers) produces a mean profit of just under one percent during the week after formation. This arbitrage return continues to be positive during weeks two and three, giving a three week holding period return of 1.32% and 1.20%. There is, however, some indication that if the portfolio is held for up to five weeks, the profitability of a contrarian strategy would be partially reversed. This is because during weeks four and five the winner portfolio marginally outperforms the loser portfolio.

The results reported in Table I indicate that short-term extreme performance among the stocks comprising the FTSE 100 Index is followed by subsequent return reversals. This would suggest that the market overreacts. Further, the apparent reduction in profitability of a contrarian investment strategy after a period of four or

Table II. Mean weekly returns to winner, loser and arbitrage portfolios, subdivided by sample period

	First subperiod			Second subperiod		
	W	L	$L-W$	W	L	$L-W$
Wk 1	−0.0041	0.0057	0.0098	−0.0013	0.0064	0.0076
	[−3.11]	[2.04]	[6.29]	[−3.72]	[3.32]	[7.86]
Wk 2	0.0009	0.0012	0.0004	0.0005	0.0036	0.0031
	[−0.31]	[−0.07]	[0.28]	[−1.94]	[0.66]	[2.55]
Wk 3	−0.0005	0.0017	0.0022	0.0017	0.0051	0.0035
	[−1.05]	[0.16]	[1.75]	[−1.04]	[2.07]	[3.49]
Wk 4	0.0019	0.0006	−0.0013	0.0028	0.0026	−0.0002
	[0.37]	[−0.35]	[−0.88]	[−0.20]	[−0.34]	[−0.19]
Wk 5	0.0030	−0.0014	−0.0044	0.0036	0.0028	−0.0009
	[0.72]	[−1.47]	[−3.39]	[0.63]	[−0.15]	[−0.90]
Wk 6	0.0021	0.0014	−0.0007	0.0028	0.0034	0.0006
	[0.29]	[−0.04]	[−0.47]	[−0.18]	[0.36]	[0.58]
MV	0.95	0.84		0.96	0.91	

Portfolios consist of winners W, losers L and a zero cost arbitrage strategy $L - W$. Stocks are assigned to these portfolios according to their performance over the previous week. Wk 1 ... 6 represent the return accruing during the first ... sixth week after portfolio formation. First Subperiod and Second Subperiod are returns calculated over the two subsamples January 1988–November 1992 and December 1992–October 1997. MV denotes the market value of the respective portfolios as a proportion of the average market value of the constituents of the FTSE 100 Index. The t-statistics, testing the significance of the returns on the winner and loser portfolios from the return on the equally weighted index, and the return on the zero cost arbitrage portfolio from zero, are reported in brackets. The t-statistics are computed from standard errors calculated using Newey–West corrections with four lags.

five weeks would imply that the return reversals are themselves partially reversed during weeks four and five. Again this suggests that the market overreacts, in this case in terms of the scale of the return reversal in response to the initial overreaction. This overreaction is greatest during the first week after portfolio formation, and is generally more significant for the winners than the losers, i.e., previous winners undergo greater return reversals than losers. The pattern of returns is similar when we divide the data into two equal subperiods.

Table II presents results to the one week strategy separated into two five-year subperiods. The arbitrage portfolio returns are 0.98% and 0.76% in the first week after formation, while three week holding period returns are 1.24% and 1.42% respectively. The differences between subperiod are not significant.

Previous research has argued that evidence of the predictability of short-horizon stock returns (as implied by the profitability of short-term contrarian trading strategies) is related to a lead-lag effect, possibly between large and small or insti-

tutionally favoured and unfavoured firms. We would argue that, given the sample of firms in the above analysis, differences in the degree of institutional following is unlikely to be an important factor behind these results. There is some evidence, however, that the average market value of the constituents of the winner and loser portfolios is less than that of the average of the FTSE 100 as a whole. We find that the market value of the winners and losers for the 'one week' strategy is 95% and 88% of average FTSE 100 value, while corresponding figures for the 'two week' strategy are 97% and 84%. While it is not surprising that the losers are smaller, (given that they are chosen on the basis of previous poor return performance), these figures indicate that the constituents of both the winner and loser portfolios are slightly smaller than the average FTSE 100 stock. Nevertheless, we argue that such a discrepancy is unlikely to be an adequate explanation for the performance of the respective portfolios. This is especially the case given that the winners are only marginally smaller, and yet produce the more significant return reversals.

In order to assess the impact of market value more directly, we examine the impact of conditioning a contrarian trading strategy both on previous returns and the market value of the extreme performers. All stocks are ranked on the basis of their returns during the preceding one and two week periods as before. The two extreme deciles (comprising the winners and losers) are then each ranked by market value. The winner (loser) portfolios are each split into two, comprising the five larger and smaller stocks respectively. We therefore measure the subsequent performance of a series of portfolios containing five stocks each, from which we obtain two sets of arbitrage returns. While the larger stock contrarian strategy appears to produce more significant profits than an equivalent smaller stock strategy, there are no significant differences in the arbitrage returns. This suggests that the larger stocks within the contrarian portfolios contribute at least as much to the return reversals as do the smaller stocks. There is therefore no evidence that the return reversals are driven solely by the smaller stocks.

3. Directional Asymmetry

McQueen et al. (1996) suggest that what they term the cross-autocorrelation puzzle is related to a directional asymmetry. This asymmetry is the result of a delay in the purchase of small stocks in response to good news. They find that small stocks respond with a delay to both good and bad news, but that this delay can be much longer after good news. If this directional asymmetry is responsible for the findings of return predictability (in the form of a lead-lag effect or return reversals), we would expect the profitability of a contrarian strategy to be driven predominantly by the returns to buying the losers rather than by the returns to selling the winners. Further, if the small stock lag (and therefore return predictability) is more significant, buying the smaller stock losers should be relatively more profitable than buying the larger stock losers. The difference in the return to buying different sized losers might also be more evident at greater lags, i.e., more than a week or two after

portfolio formation. However, we find no evidence of positive returns to buying the smaller stock losers at any lag up to six weeks. While this does not necessarily imply that there is no cross-autocorrelation between large and small stocks, it suggests that such autocorrelation cannot explain our findings of return predictability. McQueen et al.'s directional asymmetry therefore appears to be inconsistent with these results.[12]

In this section, we examine further the implications of the directional asymmetry observed by McQueen et al. They argue that this asymmetry manifests itself as a result of a marked delay in the purchase of small, volatile stocks in response to good news. This would imply that a contrarian strategy should be relatively more profitable after an upward movement in returns.[13] McQueen et al. suggest that the directional asymmetry they observe is compatible with the findings of Grinblatt et al. (1995) and Keim and Madhavan (1995). The former find that institutional traders follow certain trading strategies only after good news, while the latter conclude that 'surprisingly, some institutions behave asymmetrically in terms of their motivation for buys versus sells'. Thus, while we have argued against the presence of a lead-lag effect, there is no reason why a directional asymmetry should relate only to a lead-lag effect. In order to examine this, we modify our contrarian investment strategy accordingly. Table III presents a decomposition of the returns to the winner and loser portfolios depending on whether the market moved up (U) or down (D) during the previous week. The returns shown are those accruing during the first two weeks after the portfolios are formed.

A directional asymmetry implies that the profitability of a contrarian investment strategy will be driven by good news, i.e., the returns to such a strategy should be significantly greater after an upward movement in the market. This would imply that the arbitrage portfolio $L - W(U)$ will be greater than $L - W(D)$, for which there is some evidence. The one week arbitrage strategy produces mean arbitrage returns of 0.95% and 0.76%, while the two week strategy produces returns of 0.97% and 0.62%, respectively. Further, McQueen et al. argue that the greater profitability of a contrarian strategy after an upward market movement will be caused by a more delayed or lagged response to good rather than bad news by some stocks. This directional asymmetry would imply that the purchase of losers should be relatively more profitable after an upward movement in the market. Our results from Table III suggest that this is not the case. The return to buying the loser portfolio in the first week after an upward market movement averages 0.54%

[12] Given that our portfolio of stocks is limited to the largest on the exchange, a distinction between the larger and smaller stocks does not yield a subset of small firms. This means that while we are able to conclude that a directional asymmetry is not evident from our results, we do not draw any conclusions about a lead-lag effect between large and small firms in the UK.

[13] McQueen et al. (1996) observe a directional asymmetry in terms of a 'more' delayed response after good news. Given our sample, it is likely a directional asymmetry would be found at a much shorter lag. Hence our interpretation of the directional asymmetry in terms of a potentially greater return reversal or lead-lag effect after good news.

Table III. Mean returns to winner, loser and arbitrage portfolios following positive or negative market movements

	$W(U)$	$L(U)$	$L-W(U)$	$W(D)$	$L(D)$	$L-W(D)$	$L-W(U-D)$
One week strategy							
Wk 1	−0.0041	0.0054	0.0095	−0.0007	0.0069	0.0076	0.0019
	[−4.75]	[2.39]	[8.45]	[−1.77]	[2.52]	[5.42]	[1.07]
Wk 2	0.0007	0.0039	0.0032	0.0007	0.0004	−0.0003	0.0035
	[−1.09]	[1.59]	[3.26]	[−0.98]	[−0.79]	[−0.19]	[1.98]
MV	0.93	0.88		0.98	0.86		
Two week strategy							
Wk1	−0.0031	0.0066	0.0097	−0.0015	0.0047	0.0062	0.0035
	[−4.20]	[3.71]	[8.81]	[−2.38]	[1.32]	[4.39]	[1.99]
Wk2	0.0004	0.0038	0.0034	0.0002	0.0012	0.0010	0.0023
	[−1.29]	[1.36]	[3.14]	[−1.26]	[−0.43]	[0.70]	[1.27]
MV	0.91	0.84		1.04	0.82		

Portfolios consist of winners W, losers L and a zero cost arbitrage strategy of losers minus winners $L-W$. (U) and (D) are the returns conditional on the previous week's market return being positive or negative. $L-W(U-D)$ is the difference between the upmarket and downmarket mean arbitrage returns. One week strategy and two week strategy denote the portfolio formation period. Wk 1, 2 represent the return accruing during the first and second weeks after portfolio formation. MV denotes the market value of the respective portfolios as a proportion of the average market value of the constituents of the FTSE 100 Index.

The t-statistics, testing the significance of the returns on the winner and loser portfolios from the return on the equally weighted index; the return on the zero cost arbitrage portfolio from zero; and the difference between the returns on the two arbitrage portfolios, are reported in brackets.

and 0.66% for the one and two week strategies, compared to 0.69% and 0.47% respectively after a downward market movement.

4. Inventory Imbalances

It has been argued by Jegadeesh and Titman (1995b) that specialists' short term inventory imbalances may be a factor behind the evidence of contrarian profits. The implication of this is that we should observe an increase in negative serial covariances at times of increased volume. If this were the case, then the profitability of a contrarian trading strategy will be directly related to the level of trading volume. Conrad et al. (1994) investigate the impact of volume on the profitability of a trading strategy similar to that in Lehmann (1990). They find that high transaction stocks exhibit return reversals while low transaction stocks do not, and that as a result a contrarian trading strategy is only profitable among stocks that have previously exhibited high turnover levels.

In order to examine the impact of turnover, we condition our contrarian trading strategy on both the return and turnover of the previous extreme performers. Stocks are first ranked on the basis of their returns, and then the two extreme deciles are each ranked by level of turnover. The winner and loser portfolios are split into two, comprising the five higher (H) and lower (L) transacting stocks respectively. Turnover is measured either as the number of shares traded during the pre-ranking week as a proportion of the number of shares outstanding (Table IV, Section 1), or as the change in the level of turnover (Table IV, Section 2). Table IV below reports the results for the 'one week' strategy. (The results for the 'two week' are very similar).

An examination of the results presented in Table IV shows that the returns to a contrarian trading strategy are consistently higher for the lower transacting stocks. The one week strategy produces an arbitrage return of 1.06% and 0.32% in weeks one and two for the low volume stocks compared to 0.68% and 0.02% for the high volume stocks. For the ranking based on an increase in turnover, the arbitrage return during the first week is 1.04% for the stocks with the smallest increase and 0.70% for those with the largest increase. These differences are significant, suggesting that stocks with relatively low trading activity exhibit stronger return reversals than those where trading activity is high, whether trading activity is measured by the level of turnover or the increase in turnover. This finding is in direct contrast to the predictions of an inventory imbalance explanation for the return reversals. It also contradicts the findings of Conrad, Hameed & Niden (1994), that 'return autocovariances are negative (or securities overreact) only for last period's heavily traded securities'. Our finding of stronger return reversals among the less heavily traded stocks is consistent with the view that it takes volume to move prices, i.e., significant price changes that occur without correspondingly high or increased levels of volume are less likely to be real/permanent changes and are therefore more likely to be reversed.

5. Conclusion

This paper has investigated various aspects of the predictability of short-horizon stock returns by examining the potential profitability of some simple contrarian investment strategies. By focusing on a subset of the stocks listed on the London Stock Exchange, (those that comprise the FTSE 100 Index), we argue that the results are less likely to be explained by the impact of either lead-lag effects or measurement and microstructure-induced biases. We find consistent evidence of return predictability resulting from the short-term reversal of the previous period's extreme winners and losers. These return reversals do not appear to be driven by a lead-lag effect between the larger and smaller firms. We find that within our sample of stocks, the larger stock returns exhibit at least as much predictability as the smaller stock returns, and that the return reversal of the winners is at least as significant as that of the losers. This contrasts with previous research, which

Table IV. Mean weekly returns to winner, loser and arbitrage portfolios, subdivided by trading activity

	$W(H)$	$L(H)$	$L-W(H)$	$W(L)$	$L(L)$	$L-W(L)$	$L-W(L-H)$
Level of turnover							
Wk 1	−0.0007	0.0061	0.0068	−0.0046	0.0060	0.0106	0.0038
	[−2.26]	[2.98]	[5.39]	[−6.41]	[3.06]	[9.54]	[2.50]
Wk 2	0.0018	0.0020	0.0002	−0.0004	0.0028	0.0032	0.0030
	[−0.22]	[−0.03]	[0.17]	[−2.30]	[0.57]	[3.08]	[2.24]
Rise in turnover							
Wk 1	−0.0015	0.0055	0.0070	−0.0038	0.0066	0.0104	0.0034
	[−3.02]	[2.68]	[6.18]	[−5.21]	[3.40]	[8.17]	[2.17]
Wk 2	0.0017	0.0021	0.0003	−0.0003	0.0028	0.0031	0.0027
	[−0.35]	[−0.02]	[0.28]	[−2.17]	[0.54]	[2.65]	[1.70]

Portfolios consist of winners W, losers L and a zero cost arbitrage strategy $L - W$. Stocks are assigned to these portfolios according to their performance over the previous week. (H) and (L) represent the five higher and lower transacting stocks from each ranking of winners and losers. $L - W(L - H)$ is the difference between the low and high turnover mean arbitrage returns. The first section ranks turnover by the level during the previous week, the second section ranks turnover by its change over the previous two weeks. Wk 1, 2 represent the return accruing during the first and second week after portfolio formation.

The t-statistics, testing the significance of the returns on the winner and loser portfolios from the return on the equally weighted index; the return on the zero cost arbitrage portfolio from zero; and the difference between the returns on the two arbitrage portfolios, are reported in brackets. The t-statistics are computed from standard errors calculated using Newey-West corrections with four lags.

suggests that it is the return reversal of the losers that generates the majority of a contrarian investment strategy's profitability.

Further, we consider the possibility that the return reversals are induced by the market makers' inventory imbalances. Such imbalances imply that stocks in which trading activity has been relatively high should suffer larger return reversals. Higher trading activity, however, leads to less significant return reversals, indicating that price changes occurring in conjunction with high volume are less likely to be reversed (possibly because they are information driven). This finding again contrasts with previous research conducted in the US, which has implied that there is a positive link between return reversals and volume, leading to the conclusion that the return reversals must be related to inventory imbalances. What might explain our findings?

(i) We have specifically focused on a subset of the largest stocks in order to minimise the potential impact of liquidity related effects. Previous studies have included a full cross-section of stocks.

(ii) Our sample of stocks are screen traded by competitive market makers. It is generally recognised that such a trading system is more able to absorb imbalances in order flow relative to exchange trading with a single specialist.[14]

We conclude, therefore, that the observed return reversals are most likely to result from market overreaction.

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[14] Exchange trading may in turn have the advantage of lower order processing costs.

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