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Now you see it now you don't: The effectiveness of the recognition heuristic for selecting stocks.

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Abstract

It has been proposed that recognition can form the basis of simple but ecologically rational decision strategies (Gigerenzer & Goldstein, 1996). Borges, Goldstein, Ortmann, & Gigerenzer (1999) found that constructing share portfolios based on simple name recognition alone often yielded better returns than the market index. We describe four studies with seven samples of participants from three countries (total N = 319) in which the returns of recognized and unrecognized shares from several stock markets were tracked over various periods of time. We find no support for the claim that a simple strategy of name recognition can be used as a general strategy to select stocks that yield better-than-average returns. However, there was some suggestion in the data that recognition performs better when the market is falling and worse when it is rising. A follow-up study indicated that the absence of an overall recognition effect could not easily be attributed to our reliance on student participants or smaller samples than Borges et al. (1999) had used. We conclude that, with respect to changes in value, selecting stocks on the basis of name recognition is a near-random method of portfolio construction that offers little, if any, benefit to the personal investor.

Keywords: heuristics, recognition, investment.

1 Introduction

Can quick-and-dirty decisions reasonably be expected to result in satisfactory outcomes, or do complex problems demand complex strategies? The extent to which the array of difficult choices that we face can be adequately tackled by simple strategies has been a recurring theme in five decades of decision research (e.g., Simon, 1956; Tversky & Kahneman, 1974; Payne, Bettman & Johnson, 1993; Todd & Gigerenzer, 2003). One of the simplest choice or inference strategies imaginable is the *recognition heuristic* . Quite simply, "If one of two objects is recognized and the other is not, then infer that the recognized object has the higher value" (Goldstein & Gigerenzer, 1999, p.41). Thus, when asked to pick which movie yielded the greater gross takings, *Sin City* or *Steget Efter*, the person who recognizes only one of these titles can use the recognition heuristic (though the person who recognises neither or both of these movies must make their choice some other way). When the rate or frequency of exposure correlates positively with value, the heuristic will lead to choice or inference accuracy above chance levels (Gigerenzer & Goldstein, 1996). Thus, in our example, the positive association between media coverage (such as advertising) and movie attendances means that the recognition heuristic should have some ecological validity for the choice in question. Recent analysis by Schooler and Hertwig (2005) shows that the effectiveness of recognition may even be enhanced by forgetting — even though this leads to a failure to recognize some previously seen objects. If remembered objects are more likely to be associated with the relevant characteristics of the environment than forgotten ones, this will enhance the predictive or inferential power of recognition. In this paper we examine the application of the recognition heuristic to investment decisions, where one of many possible investments can be made. Here the recognition heuristic demands that: "when choosing a set of objects from a larger set, choose the subset of recognized objects" (Borges et al., 1999, p. 61).

Why might people use such a heuristic? First, in some situations, they may consciously accept the logic expressed in the previous paragraph. It probably makes sense to many people that the consumer products, movies, sports teams, and sports personalities that they

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have heard of are more successful than those they have not — and they will be happy to make inferences accordingly. There are occasions when failure generates notoriety: Ford's Edsell car, the movie flop *Waterworld*, the 1988 Jamaican bobsleigh team, or "Eddie The Eagle" (whose Olympic ski-jumping preparation lacked only a ski-jump). Nonetheless, generally speaking, people know that it is success that breeds the personal exposure or column inches that will encourage recognition.

Alternatively, there may be other occasions when, in the absence of deliberative reasoning about recognition, more intuitive processes may drive recognition-based choices. People reliably prefer familiar stimuli (see Bornstein, 1989, for a review of a variety of mere exposure effects) — more so when they fail to recognise previously presented stimuli at better than chance levels and are presumably not conscious of prior exposure (Bornstein & D'Agostino, 1992). Bornstein (1989) suggests that a preference for the familiar may be adaptive, as unfamiliar stimuli and situations have greater potential for risk than familiar ones do. People also judge more fluent (i.e., more easily processed) stimuli positively (e.g., Reber, Winkielman & Schwarz, 2004); and often base their judgements on how easily objects or events can be recalled (Tversky & Kahneman, 1973). Although not necessarily easy to distinguish empirically, such accounts are conceptually distinct from the recognition heuristic — stimuli may be more or less familiar, fluent or available, but are simply recognised or not recognised. Nonetheless, recognised stimuli are inevitably more familiar and more available than unrecognised ones, and possibly, on average, more fluent too (see Alter & Oppenheimer, 2006). These features could explain why recognition-based choice may occur, even when the conditions that make it an effective strategy in certain circumstances are unknown or absent.

The use of the recognition heuristic has been the subject of several empirical investigations. Gigerenzer and Goldstein (1996) reported that this heuristic helped people to make correct inferences when faced with the task of assessing which of two foreign cities had the greater population. With some modified experimental designs, this observation has also been replicated for additional samples of cities (Oppenheim, 2003; Bröder & Eichler, 2005), for rivers and for mountains (Pohl, 2006). Assessing such geographical objects is associated with stable characteristics: the true answer has rarely changed in living memory, and will usually not change for many years to come (see Serwe & Frings, 2006). For example, the correct answer to the question "Which city is larger: Colchester or Stockholm?" has been the same for centuries and is unlikely to be different in the foreseeable future. This contrasts with dynamic domains such as sports events, where the accuracy of inferences varies over time. For instance, tennis ace Roger Federer is likely, though not certain, to beat the lowly-ranked Ezequiel Krivulin. Furthermore, there may eventually come a time when this highly recognized superstar will begin to lose on a regular basis to younger unknown players. Nonetheless, it has been shown that recognition can, to some extent, predict the outcome of sports events (Serwe & Fring, 2006).

In this paper we re-examine the effectiveness of the recognition heuristic using an important, but notoriously difficult, task — stock picking. This task is also associated with variable characteristics, and so provides a tough test for the recognition heuristic. Borges et al. (1999) found name recognition to be a surprisingly successful basis for stock investment. Lay people and business graduates in the USA and Germany indicated which company names they recognized among the largest companies listed on the New York and Frankfurt stock exchanges. Portfolios of shares consisting of the most frequently recognized shares outperformed portfolios consisting of shares recognized by fewer than 10% of participants over a six-month period beginning December 1996. These portfolios of frequently recognised shares outperformed the market index in six of eight possible comparisons (treating recognition data from the four pools of participants across each of the two stock markets as distinct comparisons). Only for Americans' recognition of U.S. stocks did recognition-based investment underperform the market index. This was symptomatic of a general trend in which the advantage for highly recognised stocks was greatest when people were apparently most ignorant — i.e., using the recognition data for foreign stock markets (where recognition rates were, unsurprisingly, lower than for domestic stocks).

That such a simple strategy should prove to be effective was surprising — and therefore grabbed attention among the financial press as it runs counter to the efficient market hypothesis, which anticipates that the index cannot consistently be beaten by simple investment strategies. Borges et al. (1999) provide some speculation on the reasons for their results, for instance the possibility that features such as market share, company size and prestige may all be associated with both recognition and profitability, and that limited recognition best exploits the ability of the recognition heuristic to discriminate profitable and unprofitable shares. Put simply, the suggestion is that company success and other features that foster recognition also tend to drive up share value. Hence recognized shares will yield higher average returns than unrecognized ones. If an individual recognizes few shares, they probably only recognize the elite companies whose size and success has made them household names with good prospects for share return. However, an important question is whether such a mechanism could be sustainable in a market?

Boyd failed to replicate Borges et al.'s (1999) results in a falling ("bear") market with a sample of American students providing recognition data on US stocks. Both Boyd (2001) and Borges et al. (1999) discuss the possibility that recognition may not be a good strategy in such markets (when "big" firms are often observed to perform poorly).[1]

Merton's (1987) model of capital market equilibrium predicts that attempts to replicate Borges et al.'s (1999) finding are more likely to fail than to succeed. Merton (1987) points out that investors can acquire only those shares that they recognize. Consequently, demand and value will tend to be higher for company shares that are widely recognized. However, Merton's theory predicts that investment *returns* will correlate *negatively* with recognition — more highly recognized firms will yield lower returns, implying that the recognition heuristic should under-perform the market index. This is consistent with the "neglected firms effect" whereby the shares of firms with narrow investor bases outperform more widely held shares (Arbel, Carvell & Strebel, 1983; Arbel & Strebel, 1982). The effect persists even when company size is controlled, and may be interpreted as an informational effect. For obvious reasons, investors need information in order to predict future profits, dividends, and stock returns. The less information investors have, the greater the chance that important information that predicts extreme changes in value is missing. However, investment-relevant information (e.g., earnings releases) will be less abundant, and therefore more expensive, for obscure firms than for "high-profile" corporations that enjoy high levels of recognition and that release detailed reports on a regular basis. Therefore, in order to invest in unfamiliar companies, investors require a (risk) premium on their investment, which roughly corresponds to their increased effort in searching for information about those companies. Risk aversion would make investing in the potentially risky shares of relatively unknown firms comparatively unappealing, *unless* better-than-average returns can be expected from such shares. In contrast, the market will sustain share returns from well-known companies that are more modest, as investors feel that they have, or can obtain, sufficient information on these shares to be able to guard against the risk of severe losses.

Several studies have examined factors that ought to affect recognition (see Lehavy & Sloan, 2005) such as analyst coverage, advertising expenditure or exchange listing. Many of these have found an effect upon security value consistent with Merton (1987). For instance, Barber and Odean (2005) showed that private investors tended to purchase "high-profile" stocks that had previously experienced high volumes or returns, or had been in recent news reports. This strategy was shown to underperform the market index. Weber, Siebenmorgen and Weber (2005) provide some insight into why investors might follow an (unprofitable) investment strategy driven by the "attention-grabbing" features of shares. They found that people tend to perceive shares that they recognize as less risky than those that they fail to recognize.

More direct tests of Merton's theory have tended to focus on breadth of ownership (among institutions with holdings in excess of $100 million) as a proxy for recognition. Contrary to the predictions of Merton (1987), Chen et al. (2002) found that low levels of recognition predicted low returns. However, Lehavy and Sloan (2005) showed that changes in the breadth of ownership do indeed positively predict current share value and negatively predict future returns (when autocorrelations for value or return over time are controlled). Lehavy and Sloan (2005) and others who have examined breadth of ownership recognize its limitations as a proxy for recognition. Whilst it is plausible that increases in recognition will often result in increases in the breadth of ownership, it is illogical that decreases in the breadth of ownership might imply that some investors no longer recognize a particular company that they previously knew of.

The studies reported here employ a direct measure of recognition: we simply ask a sample of people whether they recognize the name of a companies listed on the stock exchange. Thus share recognition is considered at the level of the individual (potential investor), rather than at the level of the large corporate investor. We use these data to re-examine whether simple recognition alone can form the basis of a viable investment strategy. In particular, two questions that relate to how well Borges et al.'s (1999) findings generalize are considered. Firstly, were their results simply a function of random variation in prices or applicable only to a particular period of time? To this end our studies commence at different time points, and we track share value over differing periods of time.

[1] When revising our manuscript, we learned about a study on recognition published in a German business-psychology journal (Frings, Holling, & Serwe, 2003). This study evaluated the effectiveness of the recognition heuristic in constructing profitable portfolios of stocks. 125 German students stated whether they recognized each of the 50 companies that were quoted on Nemax50, which was a special list of the German stock exchange consisting of smaller technology companies. Using the students' responses, three portfolios of stocks were built: (A) highly recognized companies, (B) moderately recognized companies, and (C) nearly unrecognized companies. The performance of the portfolios was tracked over ten different months starting from June 2000 to June 2001, a period characterized by falling stock-prices. Performance was measured as raw return and pitted against the Nemax50-index. Portfolios A and C were worse than the index in eight of the ten periods, while Portfolio B was beaten in six periods. Frings et al. (2003) concluded that the recognition heuristic is not effective and that their finding could be due to the particular time periods that were chosen. In contrast to our study, these authors measured stock recognition at only one occasion, had participants from a single country, used native stocks, and checked raw returns over one month periods.

Readers will see that, despite being at the mercy of the markets, this allowed us to test the effectiveness of the recognition heuristic in markets that fell and rose to differing degrees — permitting a detailed re-evaluation of Borges et al.'s (1999) and Boyd's (2001) findings under a variety of conditions. Secondly, are Borges et al.'s findings restricted only to particular combinations of populations of participants and stock markets? Thus, can one say that "recognition is an ecologically valid strategy for stock selection" or simply that "recognition data from Germans and Americans selects better than average German stocks." In considering this issue, we examine recognition data on stocks from five countries for participants from three countries. In all, 13 of the 15 possible combinations that this could yield are available — and some combinations can be examined for more than one study (with recognition data from different samples of participants collected at different points in time). This permits us to test the recognition heuristic over a range of recognition rates (typically high for domestic or "home" shares, and low for overseas or "away" shares). Examination of many such participant-market combinations is important in order to determine whether there might be any general effect that favours (or penalizes) recognized over unrecognized shares. Although Borges et al. (1999) report eight comparisons between portfolios of recognized and unrecognized shares, these are not independent comparisons. For instance, there was some overlap in which shares are always recognized by laypeople and business graduates from a given country (Borges et al., 1999, p. 63).

In summary, we re-examine the two key findings of the Borges et al. (1999) data: (1) the overall validity of recognition as a method of stock selection, and (2) the increased effectiveness of recognition for "more ignorant" participants with lower levels of recognition. Note that we are not interested in whether personal or professional investors actually use the recognition heuristic — simply in whether, if they did, it would be effective.

2 Method

All four studies have similar design and analyses, and are therefore presented together.

In all studies, participants indicated which company names they recognized from lists of companies listed on major European stock exchanges. Within a given study, all participants were given identical lists of companies, presented in alphabetical order. These recognition data were collected approximately one week before the commencement of the period for which share prices were followed. Participants are identified by their country of residence, though each sample contained a minority of participants for whom that would not be their country of origin. Data collection took only a few minutes, so there was no need to induce participation by reimbursing participants for their time. However, *after* providing recognition data participants were offered the opportunity to enter a share prediction competition for which prizes were on offer. These data are not reported here.

In Study 1, 53 UK psychology students provided recognition data for Italian stocks (all 30 companies listed on the Italian Mib30 index at that time). Share values were followed from 14 October 2002 onwards.

In Study 2, 52 UK psychology students and 15 Swedish business students provided recognition data for stocks from the UK, Swedish and Italian stock exchanges. Data were obtained for 45 shares, 15 from each of the three stock exchanges (listed on the UK FTSE100, Swedish Stockholmbörsen and Italian Mib30). Shares selected were those with the 15 highest trading volumes (within each exchange) on the afternoon of 6 October 2003. Share values were followed from 16 October 2003 onwards.

In Study 3, 70 UK psychology students, 78 Austrian business students and 36 Swedish business students provided recognition data for Austrian, Swedish and German stocks. Data were obtained for 48 shares, of which nine, 16, and 23 concerned shares listed on three stock exchanges (Austrian prime list, the Swedish A-list, and the German prime standard). The shares were randomly selected. Share values were followed from 30 April 2004 onwards.

In Study 4, 15 Swedish business students provided recognition data for UK, Swedish and Italian stocks. Data were obtained for 44 shares, the same shares examined in Study 2, less one UK company that had ceased to trade. Share values were followed from 1 November 2004 onwards.

2.1 Analysis

Share returns were tracked for a 2-month period, and for longer periods in six-monthly increments from six months upwards. Two-month returns were taken from the appropriate exchange websites, and returns for longer time periods were obtained retrospectively from the Yahoo Finance website (`http://finance.yahoo.com/`). Share returns for time periods of six months and greater were unavailable for a small number of shares in Studies 1, 2 and 4 (e.g., due to cessation of company trading). These were simply excluded from analysis.

Share return was valued as the percentage increase (or decrease) in the price of an individual stock over a given horizon. Raw share returns were used as our primary means of calculating changes in value, though some anal-

yses were re-examined using dividend-adjusted prices that reflect the investor's total earnings from the stock.

We analyzed the data in two ways:

1. *Individual analyses.* This first method addressed the question of whether an investor could use his or her own recognition of shares as the basis of a viable *personal* investment strategy. We created a portfolio for each individual participant of the shares that he or she recognized (with equal investment in each share). By comparing the performance of these recognition portfolios to the complementary portfolio of unrecognized shares, or to the average performance of all shares in the consideration set, we could determine whether recognition does indeed select shares that yield better-than-average returns. This tested whether individual investors (who do not necessarily know which companies are well known to those around them) can generally exploit their own recognition. Returns adjusted for dividends (and splits) were also examined on these portfolios — we report these where results differ from unadjusted (raw) returns.

2. *Correlations between recognition and return.* This second method examined whether an investor could exploit knowledge about the levels of recognition enjoyed by different companies. We computed the correlation between company name recognition (percentage of participants recognizing the company) and the raw return. This was done separately for each combination of participant group and stock market (19 possible combinations over the four different studies). This dealt with the possibility that pooling shares from different markets together might obscure some patterns in the data.[2]

3 Results

3.1 Levels of recognition

For every participant group in each of the four studies, there was at least one share that no participant recognized and one share that all participants recognized (with one exception: the Swedes in Study 3 had a maximum recognition of 97.3%). Thus, although practical considerations meant that we were able to examine only a relatively small number of shares, levels of share recognition spanned the full range possible.

The mean and standard deviation rate of recognition are shown in the upper rows of Table 1.[3] These means show that a range of levels of recognition apply across the study groups, and the standard deviations indicate that recognition rates have reasonable variation within most participant groups.

3.2 Individual analyses

Here we analyse our data with each participant representing a case. Specifically, for each participant we examined the profitability of his or her recognition portfolio, and then aggregated the findings across each study group. Tables 1 to 4 summarize the returns accrued by the recognition portfolios, and allow comparison with the average return of the stocks included in each study, as well as with the complementary portfolios of unrecognised shares. Instances when the recognition heuristic outperforms the market index are denoted by a positive effect, whereas a negative effect indicates that investors are better off adopting an "anti-recognition" heuristic of investing in unrecognized shares. Results clearly vary from sample to sample — sometimes portfolios of recognised shares yield better-than-average returns, but at least as often the reverse is true.

Overall results are shown for 2-, 6-, and 12-month returns and indicate no consistent evidence favouring recognized over unrecognized shares, or vice versa. The overall effect sizes (data pooled case-by-case from all samples), which include over 300 observations, were not significantly different from zero for 6- and 12-month returns, with 95% CIs of (–0.05, 0.24) and (–0.23, 0.05) respectively. In the 2-month case, mean returns were significantly lower than the average return of the stocks examined, 95% CI of (–0.57, –0.17). Statistical power for each analysis was in excess of 52% to detect a small effect (d = 0.2), and in excess of 88% to detect a small-to-medium effect (d = 0.35) (Cohen, 1969). All three sign tests for these combined data were non significant. Thus the number of occasions on which recognition portfolios outperformed average stock return (and therefore outperform the complementary portfolios of unrecognized shares) was balanced by a similar number of occasions

[2] We also analyzed our data as Borges et al. (1999) did — by examining returns for separate portfolios of the most and least recognized shares. This required establishing arbitrary cut-off points to define "highly recognized" and "rarely recognized or unrecognized" shares. The results yield a similar picture of the relationship between recognition and return to those reported in our results, and, in order to avoid redundancy, are not reported. A summary of these analyses is available on request from the authors.

[3] In Tables 1 to 4:

(1) Positive effect size indicates mean recognition portfolio return > average stock return, negative effect size indicates mean recognition portfolio return < average stock return. Pooled effect size (final column of Tables 1-3) is based on standardised differences within each sample: (Recognition portfolio return — Average stock return)/(SD of return for recognition portfolios)

(2) Positive z indicates the majority of recognition portfolios yielded better returns than the complementary portfolios of unrecognized shares.

Table 1: Recognition rates and two-month raw share returns.

Study	1	2		3			4	Overall
Sample	UK	UK	Swedish	UK	Swedish	Austrian	Swedish	(pooled)
Mean % of companies recognized	10.2	42.9	58.8	13.8	41.6	39.0	63.4	
SD % of companies recognized	11.1	7.6	11.8	7.0	9.0	13.4	9.12	
Average stock return (A)	21.0	2.0	2.0	−1.5	−1.5	−1.5	8.0	
Mean % return, recognition portfolios (B)	13.1	0.2	0.1	−1.7	0.2	0.3	6.2	
SD % return (recognition portfolios)	10.4	1.0	0.5	3.1	1.1	2.0	0.6	
Effect size [B versus A] (1)	−0.76	−1.87	−3.89	0.06	1.55	0.90	−2.87	−0.36
No. of portfolios > average return (C)	7	4	0	49	32	62	0	154
No. of portfolios < average return (D)	46	48	15	21	4	16	15	165
z for sign test [C versus D] (2)	−5.36**	−5.96**	−3.61*	3.23*	4.50**	5.10**	−3.61*	−0.56

* p < .05, ** p < .0001

Table 2: Six-month raw share returns.

Study	1	2		3			4	Overall
Sample	UK	UK	Swedish	UK	Swedish	Austrian	Swedish	(pooled)
Average stock return (A)	11.8	4.5	4.5	−5.4	−5.4	−5.4	6.8	
Mean % return, recognition portfolios (B)	−18.7	4.5	4.8	−4.6	−3.6	−3.5	7.5	
SD % return (recognition portfolios)	17.6	1.3	0.9	4.5	1.5	2.9	0.9	
Effect size [B versus A] (1)	−1.73	0.00	0.33	0.18	1.20	0.66	0.78	0.10
No. of portfolios > average return (C)	6	16	9	45	30	59	11	176
No. of portfolios < average return (D)	47	36	6	25	6	19	4	143
z for sign test [C versus D] (2)	−5.49**	−2.63*	0.52	2.27*	3.83*	4.42*	1.55	1.79

* p < .05, ** p < .0001

Table 3: Twelve-month raw share returns.

Study	1	2		3			Overall
Sample	UK	UK	Swedish	UK	Swedish	Austrian	(pooled)
Average stock return (A)	27.0	2.3	2.3	−1.3	−1.3	−1.3	
Mean % return, recognition portfolios (B)	−8.0	4.6	3.6	−6.4	0.1	−0.6	
SD % return (recognition portfolios)	27.4	2.3	2.5	7.0	3.0	5.0	
Effect size [B versus A] (1)	−1.28	1.04	0.52	−0.73	0.47	0.14	−0.09
No. of portfolios > average return (C)	8	44	8	15	23	44	142
No. of portfolios < average return (D)	45	8	7	55	13	34	162
z for sign test [C versus D] (2)	−4.94**	4.85**	0.00	−4.66**	1.50	1.02	−1.09

* p < .05, ** p < .0001

Table 4: (a) 18-, (b) 24-, and (c) 30-month raw share returns.

	(a) 18-month returns			(b) 24-month returns	(c) 30-month returns
Study	1	2		1	1
Sample	UK	UK	Swedish	UK	UK
Average stock return (A)	84.3	28.5	28.5	87.4	130.4
Mean % return, recognition portfolios (B)	8.2	18.3	30.5	10.0	30.4
SD % return (recognition portfolios)	111.0	16.5	8.4	126.3	161.9
Effect size [B versus A] (1)	−0.69	−0.62	0.24	−0.61	−0.62
No. of portfolios > average return (C)	3	10	11	3	7
No. of portfolios < average return (D)	50	42	4	50	46
z for sign test [C versus D] (2)	−6.32**	−4.30**	1.55	−6.32**	−5.22**

* p < .05, ** p < .0001

where the reverse is true. For these non-parametric analyses, a small effect would be observed if recognition portfolios outperformed the complementary portfolios of unrecognized shares 55% of the time, whereas a small-to-medium effect would arise if the recognition portfolios were better 60% of the time. Statistical power for each of these analyses was in excess of 52% to detect a small effect, and was in excess of 97% to detect a small-to-medium effect. Thus, whilst we would not wish to argue for no effect on the basis of null results, it is clear that our studies had decent statistical power to identify a sizable effect should one exist.

Using dividend-adjusted returns in place of raw returns made some difference to the results. The advantage of recognized over unrecognized shares for 2-month raw returns in Study 3 disappeared. Overall, 32% of recognition portfolios outperformed their complementary portfolio of unrecognized shares (previously 48% using raw returns). This rather large discrepancy between the raw and adjusted returns presumably arose because many of the shares that we examined in Study 3 paid dividends within the first two months of the study. Using dividend-adjusted rather than raw returns made only a small difference to the results for the 6-month and 12-month horizons. There was a small shift in favour of unrecognized shares: the percentage of recognition portfolios outperforming their complementary portfolio of unrecognized shares fell from 55% to 47% at 6 months, and from a 47% to 43% at 12 months. For these dividend-adjusted returns, z-tests indicated that the advantage of unrecognized over recognized shares was significant for the 2-month ($p < .001$) and 12-month ($p < .05$) horizons

3.3 The relationship between an individual's recognition rate and the return on his or her recognition portfolio.

Here we examine the claim that limited recognition best exploits the value of recognition. We do so by considering the mean recognition rates of our study groups, and the individual recognition rates of our participants. We investigate whether an individual's recognition rate bears any relation to the returns that he or she accrued from recognition-based investment. Table 1 shows the recognition rates for each sample in each study. No clear pattern is discernable with respect to whether limited recognition ("ignorance") is advantageous. For example, in Study 3 the recognition portfolios of the UK students (who had the lowest rate of recognition) performed worst (see Tables 1 to 3); whereas, in Study 2 the reverse is true for 12-month returns (see Table 3). To determine whether participants who recognized fewer shares could expect greater or lesser returns from their recognition portfolios, we correlated portfolio size (number of shares recognized) with 2-month portfolio return across individuals (see Table 5). Results are mixed, and do not point clearly to an advantage for higher or lower levels of recognition. We examined whether a quadratic relationship might exist, whereby intermediate levels of recognition might yield better, or perhaps worse, returns (see Goldstein & Gigerenzer, 1999, who demonstrate why intermediate levels should usually be optimal in cases where recognition is effective). The addition of a quadratic component led to a significant increase in the proportion of variance in return accounted for by portfolio size in all

Table 5: Pearson r between number of shares in individuals' recognition portfolios and portfolio return.

Study	1	2		3			4
Sample	UK	UK	Swedish	UK	Swedish	Austrian	Swedish
By sample	.32	.57	−.18	−.10	−.20	−.19	−.45
Combined across the study		−0.06			.21		

but the final study. In Studies 1 and 3, intermediate levels or recognition were associated with greater recognition portfolio returns, whereas in the other two studies intermediate levels or recognition were associated with lower returns. There seems to be no clear evidence favoring the adaptivity of limited recognition.

3.4 Recognition-return correlations.

We now re-examine the value of recognition by treating each share as a case for analysis. Specifically, we analyse the relationship between the recognition rate of each share and its return. For recognition to be a lucrative strategy, this relationship should be positive with more highly recognized shares yielding greater returns. Mean, median and 95% CIs for the correlation between company name recognition and return are shown in Table 6. They show no reliable relationship between recognition and return for each of the three shortest time periods. We further examined whether the effect might differ according to whether the shares under consideration were from the same country as the participant group ("home") or not ("away"), as Borges et al. (1999) had found the strongest recognition effect when participants in one country provided recognition data for shares in another country. For "home" shares there is a slight tendency for more highly recognized shares to yield lower returns, which is consistent with Merton (1987), but at odds with Borges et al. (1999). However, this is not significantly different from the zero correlation observed for "away" shares.

4 Discussion

We failed to replicate Borges et al.'s (1999) finding that highly recognized stocks perform better than average. For recognition data from some participant groups for particular stock markets over certain time periods, recognition does yield better-than-average returns. However, on a similar number of occasions it does not. The search for any kind of regularity in our data throws up nothing that would lead to rejecting the hypothesis that recognition is, on average, simply a near random method of selecting stocks with respect to their profitability.

Furthermore, it is difficult to identify sub-cases where recognition is reliably effective in this domain. With respect to whether particular levels of recognition are advantageous, sometimes recognition portfolios derived from lower rates of recognition yielded better returns, but sometimes the reverse was true. The search for a quadratic relationship whereby intermediate levels of recognition might yield better (or worse) returns than both low and high levels of recognition also failed to show a consistent or predictable pattern. Thus "ignorance" yields no special advantage or disadvantage.

The mixed findings as to whether recognition or "anti-recognition" was the better strategy applied both in bull and bear markets. Nonetheless, there is a clear suggestion that market return may act as a moderator: the recognition heuristic tended to fare well in falling markets and perform poorly in rising ones.[4] We examined each of the 22 non-zero effects reported in Tables 1–4 for horizons up to 18 months. Nine of the ten times that recognition was the weaker strategy the market index was positive, whereas, eight out of the twelve times that recognition was the better strategy the market index had fallen (six out of seven if one considers only significant effects). This result is the reverse of what Borges et al. (1999) and Boyd (2001) speculated. It demonstrates that tests of the effectiveness of recognition require not only sampling across participants but also sampling across stimuli (in this case, different markets at different points in time) if effective generalisations are to be made. Quite why market return should moderate the effect of recognition in this way deserves some consideration. Our finding of a disadvantage for highly recognized stocks in rising markets aligns with the predictions of Merton's (1987) theory.[5] But, to the best of our knowledge, Merton does not predict a reversal of the effect of recognition during periods of falling prices. If shown by further investigation to be reliable, this moderating effect of market return would be of interest for financial economics.

[4] We thank an anonymous reviewer for drawing our attention to this tendency.

[5] Rising markets seem to represent the more usual state of the world than falling markets, as indicated by analyses of historical stock-prices. Ariel (1990) analyzed U.S. daily index returns from 1963 to 1982 and found that roughly 55% of days had positive returns.

Table 6: Pearson correlation (r) between company recognition (percentage of participants recognizing) and change in share value. Home = for shares from the same country as the participant group; Away = for shares from a different country to the participant group; N = number of correlation coefficients examined.

	Time period			For own or other country*	
	2 months	6 months	12 months	"Home"	"Away"
Mean	−.05	−.06	−.01	−.15	.00
Median	−.11	−.02	−.08	−.22	.01
95% CI	−0.23, 0.12	−0.27, 0.16	−0.18, 0.17	−0.41, 0.12	−0.11, 0.11
N	19	19	16	14	40

*Results are pooled across 2-, 6-, and 12-month returns.

The effects that we report are not all fully independent (e.g., 6-month returns are related to 2-month returns, and recognition of UK residents will bear some relation to that of Swedes). Hence, our observation of the moderating effect of market return may not be as clear cut as our tallies in the previous paragraph suggest. However, the suggestion of a moderating effect is clear enough to warrant further investigation. Other potential moderators of the effectiveness of recognition (beyond the scope of our data) may also be worthy of future investigation. There may be types of markets or conditions where recognition (or anti-recognition) performs particularly well. In addition, there may be individuals who are better able to exploit these simple strategies. We considered one such possibility — personal recognition rates (a proxy for "knowledge") — but found no consistent relationship between the number of shares recognized and the returns from investing in recognized shares.

Overall, the recognition heuristic was shown to be ineffective in outperforming average returns. If transaction costs and risk characteristics were taken into account (Fama & French, 1993), the recognition strategy may fare rather worse than our study indicates, as transaction costs for many investment products consisting of well-diversified baskets of stocks (e.g., unit trusts and tracker funds) are generally lower than for a personally constructed portfolio. But can simple trading strategies ever hope to beat the market index consistently? The efficient market hypothesis says no — on the basis that once a strategy is known to be effective, it is open to all to use, and subsequently the competitive edge of the originator of the strategy is lost (Fama, 1991). Thus information is incorporated into price movements in an efficient market. Most of the available data support this position (Malkiel, 2003). However, some quirks of the stock market which efficient markets would be expected to suppress have persisted over time, such as the tendency for prices to rise as the weekend approaches (Thaler, 1987). Following this reasoning, it could be that recognition was a genuinely effective strategy at the time that Borges et al. (1999) examined it, but through the publicity their findings earned the market "gobbled up" this strategy when investors got wise to it (Ortmann, personal communication). This is a difficult position to argue against — as it would seem to be an unfalsifiable proposition. However, we note that given the extent of our data, this adjustment in the market would have to have applied to several European stock markets. Much as we are fond of the idea that academic research has impact outside our ivory towers, it is probably more parsimonious to assume that the success of recognition was attributable to factors that are perhaps random, or, more likely, irregular or unpredictable — i.e., particular combinations of factors that may not occur again, or may occur with no particular regularity.

We ought to be careful to state that we are not trying to argue strongly that recognition generates portfolios that are systematically worse than random. For mean return over two month (and for dividend adjusted returns over two months and twelve months) the data are marginally in that direction. Such an observation could be considered to accord with Barber and Odean (2005), who found that shares that were heavily traded or that received extensive media coverage were less profitable than average. However, were one to add the Borges et al. (1999) data to ours, the combined result would be close to a zero average effect. Similarly, the weak negative correlation between recognition and return for "home" shares is consistent with Merton (1987), but we can think of no reason why Merton would not predict a similar relationship for "away" shares. Therefore, one could take the more optimistic view that recognition is as good a way of picking stocks as picking a similar number of shares at random. Given that the small-time, naïve or casual investor often fails to pick stocks that outperform random picks (Jasen, 2002), this could be said to be a viable personal investment strategy (with the proviso that portfolios ought to

be sufficiently large and diverse to avoid exposing the investor to excessive financial risk).

Boyd (2001) conjectured that his failure to replicate the findings of Borges et al. (1999) could have been because his participants were students, who might be expected to recognize rather different companies to the general population (who were sampled by Borges et al.). We have had the same question put to us in respect of our own data, which we investigated by conducting a further survey of share recognition in June 2006. Share recognition data from 88 students from the University of Essex was compared against data from 18 university employees and 62 members of the general public who were approached in the centre of Colchester (a medium-sized provincial town within commuting distance of London). Participants indicated if they recognized each of 114 company names: the companies used were those listed on the UK FTSE100 share index, plus the Swedish companies that we examined in Study 2 (presented as a single list in alphabetical order). Mean percentage recognition was higher among the non-student group (42.4% versus 33.4%). However, crucially, the correlation between the levels of company name recognition elicited from the two groups was extremely strong (r = .95). Thus companies that enjoy relatively higher (or lower) name recognition among students also enjoy higher (or lower) levels of recognition among a non-student population. Thus, as long as one's goal is to identify which companies have high or low levels of recognition among the general populace, as opposed to estimating precise levels of recognition, a student sample would appear to be perfectly adequate.

We also used these data to investigate whether our reliance on small samples of participants in some studies could have influenced the results by producing unreliable recognition data. The percentage company name recognition was computed using the data from 15 randomly chosen participants. This was correlated with the corresponding recognition levels computed from the remaining 153 participants. This procedure was repeated 50 times. The median correlation between the small and large samples was .96 (range .94 to .97). Thus, even a modestly sized sample can provide a remarkably clear indication of the best- and least-well recognized companies (as determined by a much larger sample of people).

Previous research on share recognition using proxy measures of recognition (such as investor base) that are easily extracted from existing data bases have been able to examine large numbers of shares . In committing ourselves to a direct behavioural measure of recognition we restricted ourselves to examining a rather smaller number of shares than we would have wished. However, the shares that we examined spanned the full range from the highly recognized to the rarely recognized. Therefore, if recognition has a clear impact upon share return it ought to have been the case that we had a good chance of observing this in our data.

We have not directly examined cognition in this paper — simply whether a particular simple (cognitive) strategy is a viable basis for decisions in a complex economic market. However, our results do have some bearing upon cognition, in so far as some have suggested that recognition may have a privileged status such that when it can be used it often will be without recourse to additional information or further processing (e.g., Gigerenzer & Goldstein, 1999). Here we have unearthed at least one example to suggest that were such a privileged status to exist, it will not always be to the decision maker's benefit. Quite possibly, the dynamic nature of a market provides a rather challenging environment for recognition to prosper in — making it difficult for such a strategy to make reliable and sustainable profits.

It is often hard to present null or conflicting results — especially when, as here, prior research has found evidence of a relationship. We cannot argue that recognition has no impact upon share return. However, our results indicate that any average effect over a range of times and locations is likely to be small (and, if there is an effect, that it is likely to favour unrecognized rather than recognized shares). Indeed, this is apparent in many of the prior investigations that we have discussed: breadth of ownership (the most common proxy measure of recognition) accounts, at most, for 1% of the variance in share return (e.g., Bodnaruk & Östberg, 2005; Lehavy & Sloan, 2005). We can think of many situations where recognition provides useful information to guide inference or choice — and can improve upon simple guesses or random selections. However, we think our data adequately demonstrate that investment in shares is unlikely to be one of them. Our data do suggest that recognition may be relatively effective when a market is falling — but on these occasions, it merely serves to limit one's losses — and you would be better off selling your shares, and buying bonds, or putting the money under your mattress.

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