

## THE RECOGNITION HEURISTIC: A FAST AND FRUGAL WAY TO INVESTMENT CHOICE?

ANDREAS ORTMANN

*CERGE-EI, Prague, Czech Republic*

GERD GIGERENZER

*Max Planck Institute for Human Development, Berlin, Germany*

BERNHARD BORGES

*Coopers and Lybrand, Westport, CT, USA*

DANIEL G. GOLDSTEIN

*Columbia University, NY, USA*

Picking a portfolio of stocks that will beat the market is notoriously difficult. Empirical evidence suggests that on average it is not possible. In fact, the majority of professional stock pickers consistently underperform market averages. It is therefore an interesting question without an obvious answer as to how a simple heuristic like the recognition heuristic performs in such a turbulent real world domain. Here we report how stock portfolios that employed recognition heuristics fared relative to market indices, mutual funds, chance or “dartboard” portfolios, individual investment decisions, portfolios of unrecognized stocks and other benchmarks proposed by third parties.

### **1. Investment Theory and Practice**

Some academics have concluded that it is impossible to beat the market in the long run. This stance is captured in the efficient market hypothesis (EMH), which maintains that agents cannot attain above average returns indefinitely (e.g., Muth, 1961; Cootner, 1967; Lucas, 1980). Despite early empirical challenges (e.g., Rozef and Kinney, 1976), the EMH has been fully incorporated into the leading normative models, such as the widespread Capital Asset Pricing Model (e.g., Sharpe, 1964) – itself constituting the basis for modern portfolio management theory.

Outside the ivory tower, professional investors such as Soros (1994) have doubted the realism and relevance of the EMH and have turned instead to technical trading rules based on sophisticated analytical measures that lie beyond the layperson’s reach. The effectiveness of such measures, however, is questionable. The empirical evidence suggests that, while top-decile mutual funds earn back their investment costs, most other

funds underperform performance benchmarks such as the Standard and Poor 500 by about the magnitude of their investment expenses (Carhart, 1997). Those in the bottom deciles do even worse.

## **2. Recognition-based Investment Decisions**

Since knowledge and expertise seem to be of less use in predicting the stock market than commonly presumed and asserted, we wondered how an investment heuristic based on ignorance would fare. Putting the recognition heuristic to work in the stock market requires some degree of ignorance (i.e., a lack of recognition). For example, financial experts who recognize the names of all stocks cannot use the recognition heuristic to choose among them. Nor can people who have not heard of any stocks. Between these two extremes, a large number of people display what we call a “beneficial degree of ignorance.”

Originally, Gigerenzer and Goldstein (1996, 2002) formulated the recognition heuristic as follows: When choosing between two objects, of which only one is recognized, choose the recognized object. The following generalization of the recognition heuristic is useful when picking stocks for investment:

### *2.1. When Choosing a Subset from a Larger Set, Choose Those Objects in the Larger Set That are Highly Recognized*

Thus, there are two versions of the recognition heuristic, one for individual and one for group recognition. In the individual case, the recognition heuristic dictates choosing only those stocks recognized by the person. In the group case, the recognition heuristic dictates choosing “highly” recognized stocks, that is, those with names that are recognized by a high percentage (e.g., 90%) of the group.

## **3. Study 1**

### *3.1. Study Design*

Germans and Americans were asked to indicate which companies they recognized from those that constituted the Standard and Poor 500 and a German analogue of 298 stocks trading on German stock exchanges in December 1996 (Borges et al., 1999). The interviewees were randomly selected and belonged to one of four categories: American laypeople, American experts, German laypeople and German experts. The laypersons were 360 pedestrians surveyed in downtown Chicago and Munich; the experts were 120 graduate students in finance or economics interviewed at the University of Chicago and the University of Munich. Every participant was paid a token of appreciation (e.g., the

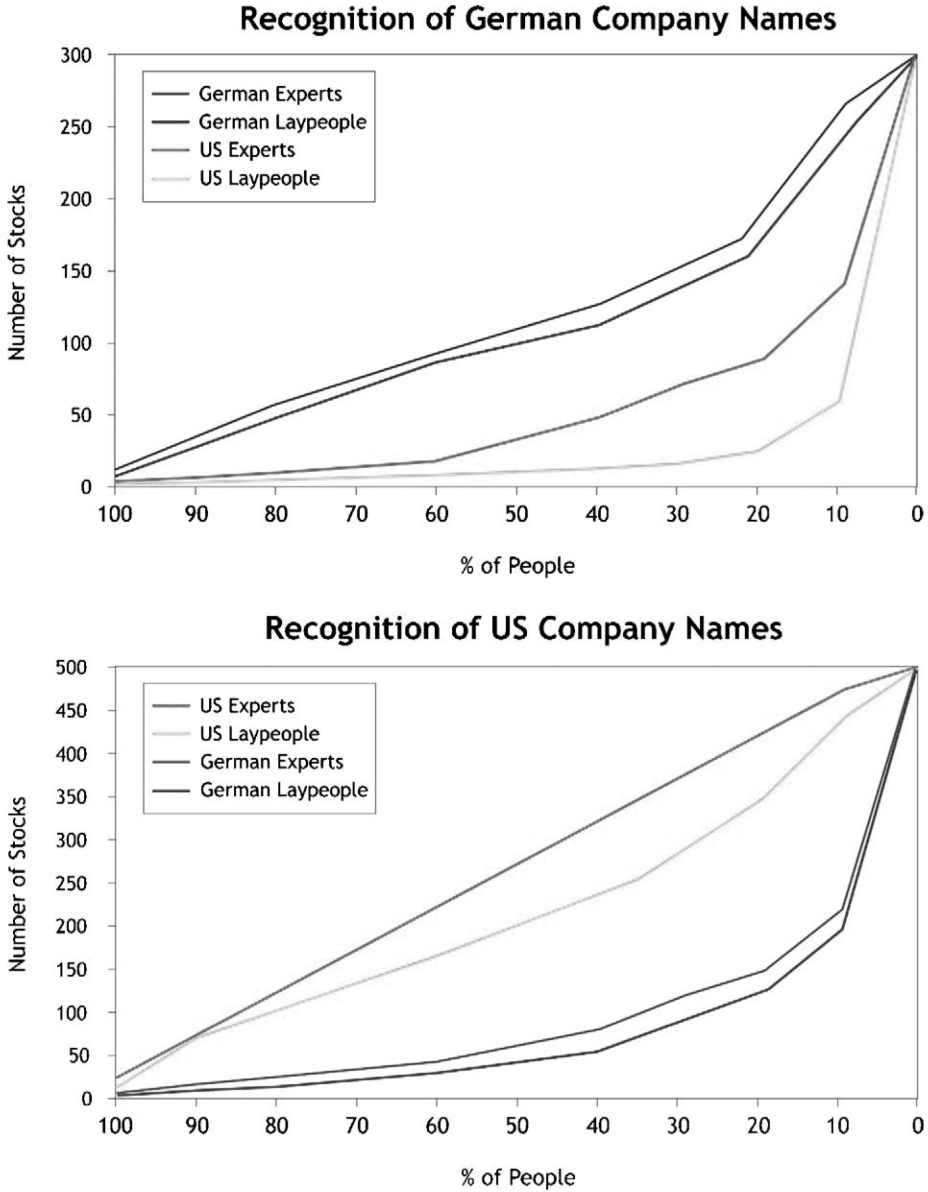


Figure 1. Number of company names recognized by % of people, for four groups of people and German and U.S. companies. For instance, 14 German company names were recognized by 100% of German experts, 33 company names were recognized by 90% or more of German experts and so on. The international recognition rates were the lowest: The American pedestrians surveyed, for instance, did not unanimously recognize a single German firm (Borges et al., 1999).

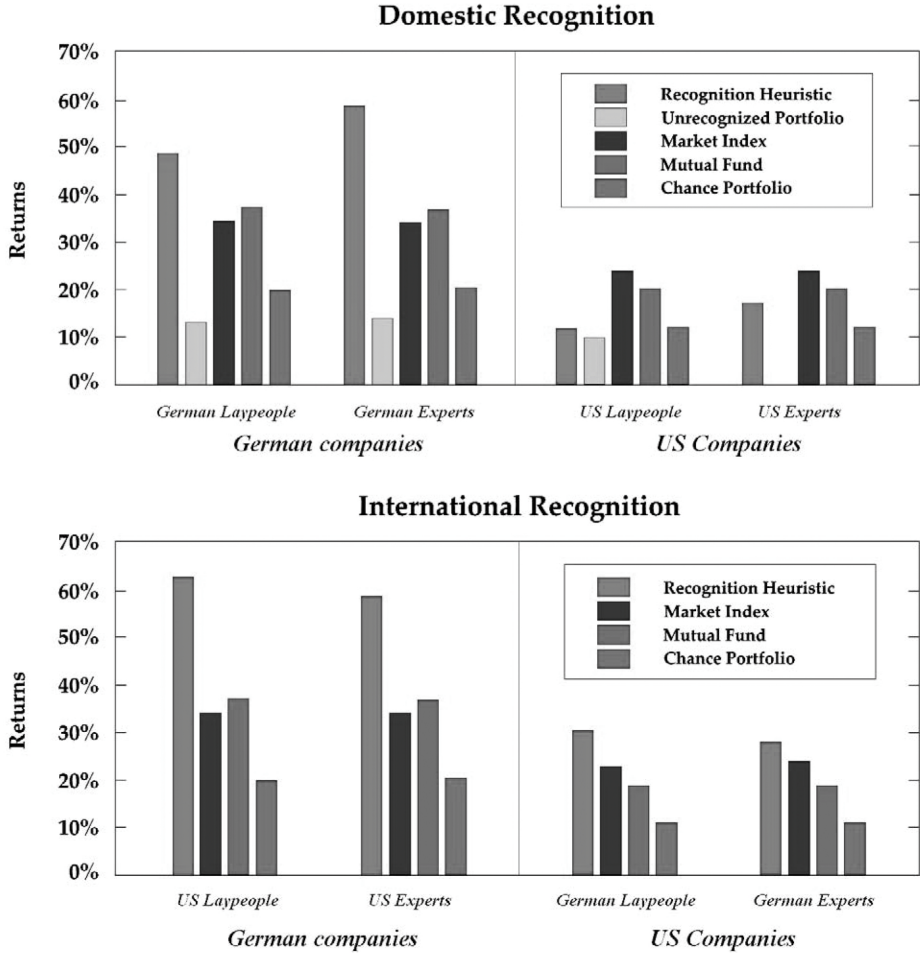


Figure 2. Performance of the recognition heuristic for companies with the highest recognition rates by German laypeople, German experts, U.S. laypeople and U.S. experts. Results are for the six months following the date of the recognition test, December 1996 to June 1997. For comparison, the performances of unrecognized stocks (0% to 10% recognition rates), the market (Dow or Dax), managed mutual funds (Fidelity Growth Fund or Hypobank Investment Capital Fund) and chance portfolios (average returns of 5000 portfolio combinations) are given. The recognition-based portfolio for the German experts, for example, reached a return of 57% compared to 14% for the unrecognized stocks and outperformed the market, that is, the Dax 30 (Borges et al., 1999).

German pedestrians were paid DM 5 for about 5 minutes of their time). Figure 1 shows the number of companies recognized by a given percentage or more of the population.

To test the performance of the recognition heuristic on the stock market for each of the four groups, we constructed two investment portfolios consisting of highly recognized

companies. One portfolio type consisted of companies within the group's home country ("domestic recognition") recognized by 90% or more of the participants in a group. The other portfolio type contained the top ten most-recognized foreign companies for each group ("international recognition"). Thus, there were a total of eight recognition-based portfolios, as shown in Figure 2. All portfolios were "bought" and held (i.e., we did not change their composition after purchase).<sup>1</sup>

We analyzed the performance of recognition-based portfolios for six months from the completion date of the recognition test, December 13, 1996. The returns of the high recognition portfolios were compared with the performance of (a) the stocks of essentially unrecognized companies ("low recognition portfolios"), defined as companies recognized by fewer than 10% of the participants, (b) market indices, (c) mutual funds, (d) chance portfolios and (e) individuals' investment choices.<sup>2</sup>

### *3.2. How Did High Recognition Portfolios Perform Relative to Low Recognition Portfolios?*

Figure 2a shows that the returns associated with each of the four recognition-based portfolios based on domestic recognition were favorable compared to portfolios comprised of stocks from unrecognized companies. The average return of the portfolios built using the recognition heuristic was more than triple that of portfolios built from unrecognized stocks.

As a control, we calculated the performance of portfolios based on the top 20 and top 30 recognized stocks for the four international tests. The result was similar: Figure 3 shows that portfolios comprised of stocks with higher rates of recognition led to higher returns in seven of eight cases.

### *3.3. How Did High Recognition Portfolios Perform Relative to Market Indices?*

Recognized stocks outperformed unrecognized ones, but this may be of little interest to professional stock pickers whose main interest is beating the market. Can the

<sup>1</sup> One of the authors decided to put his money where his heuristic was and in a bid for early retirement he invested a nontrivial amount of money on German stocks recognized by Munich pedestrians. While not yet retired, he was not disappointed by the ignorance of the laypeople.

<sup>2</sup> Our performance analysis is based on price data only. The data were collected from the *Wall Street Journal*, the *New York Times* and the *Amiliches Kursblatt* and do not adjust for stock splits. It turns out that about 8% of the companies in our U.S. sample underwent such splits – three out of four of the splits being 2-for-1 and most of the remaining ones being 3-for-2 splits. (We have not been able to assert to what extent this problem also affects the German data.) We note that the comparisons reported below are therefore systematically biased against the recognition heuristic wherever performance measures included such adjustments for those splits, as is the case for market indices and mutual funds. In other words, in comparisons with market indices and mutual funds, the recognition heuristic actually did better than our results suggest. We are in the process of computing a comprehensive follow-up study of Borges et al. (1999); the extension study will employ data from CRSP and KKMDB.

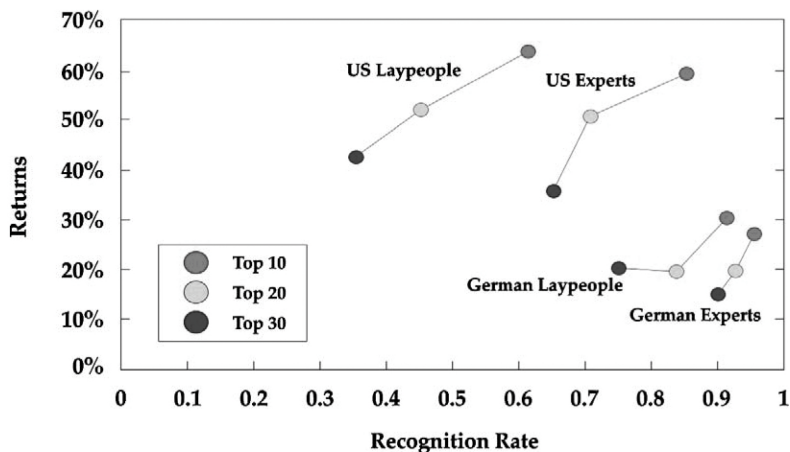


Figure 3. There is a direct relationship between the recognition rate and the returns of international portfolios for each of the four groups. The Top 10 portfolio, for example, contains the ten most recognized non-domestic stocks. The performance of the four Top 10 portfolios were shown in Figure 2 (international recognition). When portfolios were expanded to include the 20 or 30 most recognized stocks, recognition rates decreased, as did returns (Borges et al., 1999).

recognition-based portfolios perform close to the Dow and Dax market indices? Figure 2a shows that for domestic recognition, the result was divided. Investment portfolios based on recognition by German experts and laypeople outperformed the Dax 30 for the period of investigation. The portfolios of highly recognized American stocks, based on recognition by American laypeople and experts, made money but failed to outperform the Dow 30 benchmark.

Did international recognition, with its greater degree of ignorance, lead to greater returns? It did. Figure 2b shows that in all four cases of international recognition, the recognition heuristic beat the relevant market index. Furthermore, in all four cases, international recognition led to higher returns than did domestic recognition and the ignorance of laypeople led to slightly more profitable portfolios than did that of experts. This result suggests that the greater the degree of a group's ignorance, the better it is for picking stocks using the recognition heuristic.

### 3.4. How Did High Recognition Perform Relative to Managed Funds?

How did the recognition heuristic perform when compared to the tools and knowledge of professional portfolio managers? We selected two major mutual funds, the American-based Fidelity Blue Chip Growth Fund and the German Hypobank Investment Capital Fund, as benchmarks for the performance of the recognition heuristic.

As evident from Figure 2 and confirming Carhart's (1997) results, portfolios based on the recognition heuristic beat managed funds in six of the eight possible tests. The

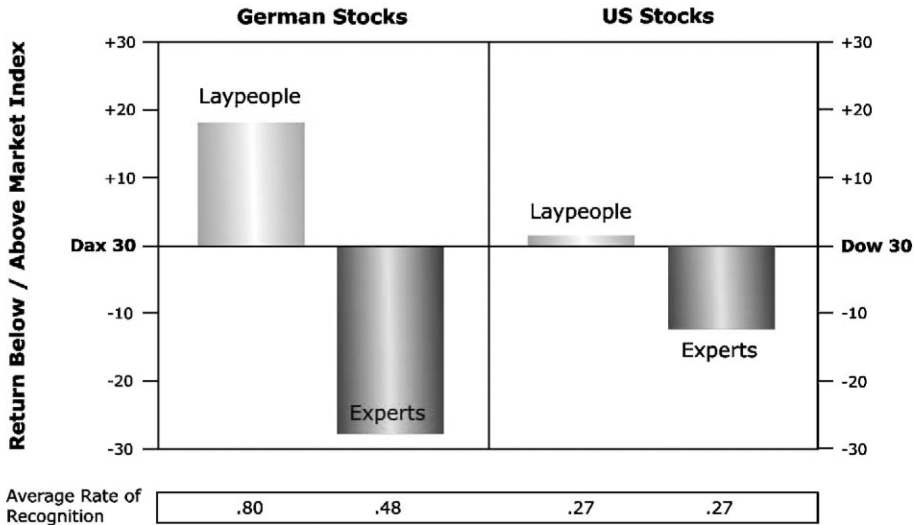


Figure 4. The performance of stocks picked by German laypeople and experts for both domestic and international portfolios followed the trend set by “beneficial ignorance.” Laypeople tended to pick highly recognized German stocks for investment, whereas experts opted for less recognized stocks. Laypeople’s stock picks achieved a staggering return, whereas the experts’ picks actually lost money. For the Germans’ picks of ten American stocks, the average recognition rate was low (.27) and did not differ between experts and laypeople. Consequently, both portfolios of international picks performed worse than the portfolios of recognized stocks in Figure 2 (Borges et al., 1999).

collective ignorance of pedestrians in Munich, for instance, led to higher returns than the knowledge and expertise of American and German fund managers. Moreover, international ignorance led to higher returns than domestic ignorance: The two most ignorant groups, German laypeople and experts (as measured by the total number of stocks recognized), gained the most from their lack of knowledge.

### 3.5. How Did High Recognition Portfolios Perform Relative to Random Stock Picks?

The *Wall Street Journal*’s renowned investment column has demonstrated that random stock picks, determined by throwing darts at scrambled lists of stocks, often outperform expert picks. We constructed 5000 random portfolios, each consisting of ten stocks from both the American and German markets and evaluated them for the period of our study. The recognition heuristic beat the average returns of the random portfolios in seven of the eight possible tests and matched it in the remaining one. The recognition heuristic turned out to be a far better stock-selection tool than random stock picks.

### 3.6. *How Did High Recognition Portfolios Perform Relative to Individuals' Investment Choices?*

German experts and laypeople were asked to identify up to ten stocks that they would choose for investment purposes from the lists of companies used for the recognition test. Did they pick highly recognized stocks? As measured by the average recognition in their group, the German laypeople tended to pick highly recognized stocks for investment while the experts chose more esoteric ones. As evident from Figure 4, the laypeople outperformed the experts by a wide margin. Note that the stocks which laypeople picked performed above the market and about as well as the recognition heuristic based on their recognition data (Figure 2). In contrast, the stocks which experts picked performed below the market; had they instead relied on mere recognition, they would have outperformed the market, for both German and U.S. stocks.

## 4. From Recognition to Riches?

Can a fast and frugal heuristic that exploits patterns of ignorance rather than substantial knowledge make money on the stock market? For the period investigated, stock portfolios that employed the recognition heuristic outperformed in the overwhelming number of cases and often clearly, market indices, mutual funds, chance or “dartboard” portfolios, individual investment decisions and portfolios of unrecognized stocks.

## 5. Study 2

Our initial results prompted plenty of press coverage and a bimodal pattern of response. There were those who said, “We knew it all along.” Then there were those who suggested that our results were flawed for various reasons and that, in any case, we would not be able to replicate our results – especially in a down market. We are currently following up on the original study (Borges et al., 1999). In the meantime, we decided to put the recognition heuristic to a test in two slightly different environments: two stock-picking contests in Germany organized by nationally distributed magazines in the spring and summer of 2000.

The timing of these contests was the six-week period from February 28, 2000 to April 7, 2000 for the first competition and the eight-week period from May 29, 2000 to July 21, 2000 for the second. The timing of the competitions could not have been better: it gave us the opportunity to evaluate the performance of the recognition heuristic in exceptionally turbulent and contracting market environments. In fact, in early March of 2000, the NASDAQ finished above 5000 (as things look at the writing of this contribution, its all-time high for a long time to come) and started to decline for the remainder of the first contest period.



The two competitions also gave us the opportunity to test our fast and frugal way of investing under parsimonious conditions and thus respond to the objection that our collection of the recognition data in the earlier study (Borges et al., 1999) was rather elaborate. Lastly, we were given the chance to explore to what extent the widespread coverage of our original experiment had invalidated the recognition heuristic as a successful investment strategy.

### 5.1. *Study Design*

The two sets of stocks on which the stock-picking contests were based had been respectively determined by two German magazines that aspire to be specialist journals for financial markets, namely *Capital* and *Boerse Online*. (For the contest, the latter joined forces with the well-known national magazine *Stern*.) Both contests followed essentially the same format: moderate sign-up fees, no trading fees, no restriction on portfolios, significant prizes. The *Capital* stock-picking contest was based on 50 “international internet equities”; the *Stern–Boerse Online* stock-picking contest was based on a broader set of 100 international internet equities and more traditional firms such as Adidas, American Express, Coca-Cola, Daimler Chrysler and the like (for details see Ortmann and Gigerenzer, 2002).

In the week preceding the *Capital* (and, respectively, the *Stern–Boerse Online*) contest, we asked 50 (30) female and 50 (30) male pedestrians randomly selected in Berlin to identify the companies that they recognized from lists they were presented. We offered all participants DM 5 as a token of appreciation. As in our earlier study, we compiled the recognition data from the questionnaires and constructed separate portfolios of high and low recognition stocks. These portfolios were submitted to the respective stock-picking contest in a buy-and-hold pattern (i.e., we did not change the composition of our portfolios once purchased).

In the *Capital* stock-picking contest, we entered portfolios that contained the ten most and ten least recognized stocks. For the *Stern–Boerse Online* contest, we followed Borges et al. (1999) and identified those companies that 90% of the female and 90% of the male study participants recognized (7 and 14, respectively). Since we were concerned about a reasonable degree of diversification and since seven seemed to give any one outlier too much influence, we also identified those companies that 80% of the female and male study participants recognized (20 and 23, respectively). Finally, we compiled a portfolio of those stocks that were recognized by no more than 10% of all participants. These five portfolios were then entered in the *Stern–Boerse Online* stock-picking contest.

### 5.2. *How Did High Recognition Portfolios Perform Relative to Low Recognition Portfolios?*

In the *Capital* stock-picking contest, the 10-stock, high recognition portfolio gained 2.53% and ranked 2085 (out of about 17,600 portfolios submitted by 11,400 partic-

ipants), placing it safely in the top 15% of portfolios. The 10-stock low recognition portfolio lost 16.97% and ranked 12,976. In the *Stern–Boerse Online* stock-picking contest, all four high recognition portfolios (7.38%, rank 9029; 4.80%, 13,975; 3.32%; 17,325; 2.32%, 19,664; out of about 43,000 portfolios submitted by 31,000 participants) outdid the low recognition portfolio (−1.69%, rank 29,348).

### 5.3. *How Did High Recognition Portfolios Perform Relative to Various Benchmarks?*

The recognition heuristic beat various *Capital* stock-picking contest indices, such as buying equal amounts of all stocks, by more than 6% to 8%. It also beat the benchmark proposed by *Capital* – its editor-in-chief, whose portfolio lost 18.55%. In the *Stern–Boerse Online* contest, all four high recognition portfolios outperformed the median portfolio decisively. Each of them also proved better than the benchmark that *Stern–Boerse Online* had proposed – a TV show master and former trader, whose portfolio gained less than 1%.

### 5.4. *What About Gender Effects?*

Recall that we entered four high recognition portfolios in the *Stern–Boerse Online* competition, two of which drew on recognition data from female pedestrians and two of which drew on portfolios from male pedestrians. We compiled these portfolios because there is tantalizing evidence (Barber and Odean, 2001) that women are less confident about their financial savvy, yet perform better.

We found that in both stock-picking contests, female participants reported to recognize fewer stocks. Yet the performance of the two portfolios based on women's recognition data (7.28% and 4.80%) was better than the two portfolios based on men's recognition data (3.32% and 2.32%).

### 5.5. *From Recognition to Riches?*

Stock-picking competitions have their own laws. Since the entry fees are low and since there are no trading fees, people are likely to buy multiple portfolios and to engage in riskier strategies. These idiosyncrasies induce a mean preserving spread of returns, which in turn handicaps the performance of the recognition heuristic.

The results reported here provide evidence for the surprising viability of the recognition heuristic in the notoriously difficult environment of financial markets – and down markets, for that matter.<sup>3</sup> Once again, high recognition portfolios outperformed

<sup>3</sup> After finishing the manuscript, we learned about Boyd (2001), who reports somewhat different results. His results seem to be mainly due to a different subject pool (college students rather than pedestrians), whose recognition of stocks was idiosyncratic and resulted in disproportionate losses (e.g., Yahoo!, Xerox, Bausch and Lomb, Texas Instruments, ATandT) or disproportionate gains (e.g., nursing home operator Manor Care, energy provider Central and South West, forest products company Willamette Industries). In fact, these companies accounted for roughly all gains in Boyd's high recognition portfolio and all losses in his low recognition portfolio.

both low recognition portfolios and various reasonable benchmarks. The results of the stock-picking contests show that the recognition heuristic can be implemented with a minimum of effort. The results also suggest that the publication of earlier research has not yet invalidated the success of the recognition heuristic.

## 6. Conclusion

The surprising performance of recognition-based portfolios in both studies provides further evidence that simple heuristics can make accurate inferences about real-world domains. The stock market is a complex real-world environment in which lack of recognition is not completely random but systematic and simple heuristics such as recognition can exploit these regularities to make accurate inferences at little cost. The recognition heuristic does not rely on a sophisticated analysis of financial markets, the Capital Asset Pricing Model and the like. It is imperative to understand why and under what conditions this simple heuristic can survive in markets that are far removed from those situations where it served some evolutionary purpose.

## References

- Barber, B., Odean, T. (2001). "Boys will be boys: Gender, overconfidence and common stock investment". *Quarterly Journal of Economics* 116, 261–292.
- Borges, B., Goldstein, D.G., Ortmann, A., Gigerenzer, G. (1999). "Can ignorance beat the stock market?" In: Gigerenzer, G., Todd, P.M., the ABC Research Group (Eds.), *Simple Heuristics that Make Us Smart*. Oxford University Press, Oxford, UK, pp. 59–72.
- Boyd, M. (2001). "On ignorance, intuition and investing: A bear market test of the recognition heuristic". *Journal of Psychology and Financial Markets* 2, 150–156.
- Carhart, M.M. (1997). "On persistence in mutual fund performance". *Journal of Finance* 52, 57–82.
- Cootner, P. (1967). "The Random Character of Stock Market Prices". MIT Press, Cambridge, MA.
- Gigerenzer, G., Goldstein, D.G. (1996). "Reasoning the fast and frugal way". *Psychological Review* 103, 650–669.
- Goldstein, D.G., Gigerenzer, G. (2002). "Models of ecological rationality: The recognition heuristic". *Psychological Review* 109, 75–90.
- Lucas Jr., R.E. (1980). "Studies in Business Cycle Theory". MIT Press, Cambridge, MA.
- Muth, J.F. (1961). "Rational expectations and the theory of price movement". *Econometrica* 29, 315–335.
- Ortmann, A., Gigerenzer, G. (2002). "The recognition heuristic in financial markets: Results from two stock-picking contests". Discussion paper, CERGE-EI, Prague.
- Rozef, M.S., Kinney, W.R. (1976). "Capital market seasonality: The case of stock returns". *Journal of Financial Economics* 3, 379–402.
- Sharpe, W.F. (1964). "Capital asset prices: A theory of market equilibrium under conditions of risk". *Journal of Finance* 19, 425–442.
- Soros, G. (1994). "The Theory of Reflexivity". Soros Fund Management, New York.