

Cross-cultural overconfidence and biased self-attribution

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Abstract

We use a stock-market game and predictions of examination marks to examine differences between overconfidence and biased self-attribution (BSA) of British and Asian students. Although different overconfidence measures show little correlation, Asians are consistently more overconfident than the British. All are equally prone to BSA.

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1. Introduction

Behavioural finance models frequently assume the existence of ‘irrational characteristics’ that are regularly found in psychology experiments, such as ambiguity aversion, loss aversion and narrow framing. A developing strand of the finance literature (for example, Benos, 1998; Daniel et al., 1998; Odean, 1998) is based on another such characteristic, overconfidence. It suggests that if investors are overconfident then financial markets will be characterised by greater trading activity and higher price volatility.

Although there is some investigation in the finance literature itself for the existence of overconfidence (for example Malmendier and Tate, 2005, who investigate the existence of managerial overconfidence, or Glaser et al., 2005 who provide evidence on the degree of overconfidence of professional traders and investment bankers), most of the evidence for it comes from the results of experiments reported in the psychology literature. Within this psychology literature a number of different types or traits of overconfidence have been identified and, more recently, the relationships among them explored.

Evidence for one type – commonly referred to as miscalibration – comes from studies which ask a participant to answer a question and state how confident they are about their answer, or which ask them to give a range that they feel includes the correct answer (see, for example, Klayman et al., 1999; Yates et al., 2002). The evidence for its existence and prevalence appears very strong, although some writers, for example Griffin and Varey (1996), Ayton

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and McClelland (1997), and Soll (1996), have suggested that some of this evidence is contaminated by experimental issues, such as the choice of question type by the researchers. Miscalibration can be seen as one example of a broader type of overconfidence which we shall refer to as ‘stand-alone’ overconfidence, since it is a form of self-appraisal that does not require comparison with others.

Another broad type of overconfidence is overconfidence about one’s abilities relative to other people. The smaller volume of work on this type explores tendencies such as the ‘better-than-average’ effect, whereby people generally assess themselves as having greater ability than average (see for example Svenson, 1981; Alicke et al., 1995; Larrick et al., 2007; Glaser and Weber, 2007, who distinguish between miscalibration, too tight volatility estimates, and the better-than-average effect²). In what follows we describe this type of overconfidence as ‘referential’.

The degree of correlation between different types of overconfidence is an issue of general interest but especially so for the finance literature. It is common in this literature to define overconfidence as a mistaken belief in the precision of one’s information (as in Daniel et al., 1998, for example). Although this appears to relate directly to the miscalibration literature, it implicitly assumes that the precision is being judged relative to the precision of the information held by others. That is, it is a *referential* judgement. It is therefore important to investigate the degree to which the two categories of overconfidence are related. A number of studies have explored this issue. For example, one argument for a positive correlation between stand-alone and referential overconfidence put forward in Stankov and Crawford (1997), is that they might both be the result of high levels of self-esteem; similarly, Griffin and Brenner (2004), suggest that optimistic overconfidence – the tendency to overestimate the likelihood that one’s favoured outcome will occur – might arise from the better-than-average effect, unrealistic optimism and the illusion of control. However, the evidence for such correlations is mixed. Régner et al. (2003), find no correlation between miscalibration and ‘positive illusions’, such as the belief that one is above average or the illusion of control; while Glaser et al. (2005), argue that “some facets of overconfidence that are often assumed to be related (miscalibration and the better-than-others effect) are actually unrelated, which casts doubt on the optimistic overconfidence perspective as a framework for explaining judgemental overconfidence.” (p. 27).

One final issue is whether there are significant differences between individuals in the various traits of overconfidence and whether any such differences are stable. The evidence (see, for example, Jonsson and Allwood, 2003; Glaser et al., 2005) seems to suggest that for any particular trait there are indeed significant differences across individuals which are stable over time, whereas correlations across traits are much weaker.

In this paper we use data from an Internet-based stock-market game played by undergraduates, together with their exam results, to address some of these issues. We examine the extent to which the participants exhibit stand-alone and referential overconfidence, and whether there is correlation between these two characteristics. Having found strong evidence for both types of overconfidence we test whether referential overconfidence is stable over time³ and whether men and women differ in these characteristics. Since 16% of our subjects are East Asians (defined as from China, Hong Kong, Malaysia or Taiwan, and henceforth referred to as Asians, for brevity), we also test whether there are cross-cultural differences in overconfidence.

Another central aspect of some of the overconfidence-related finance literature that we consider is biased self-attribution (BSA), the tendency to view events that confirm one’s views or superior ability as evidence of one’s skill, while ascribing events contradicting them to sabotage or noise. For example, Gervais and Odean (2001), model a circular process where BSA feeds overconfidence; and Daniel et al. (1998), model ‘outcome dependent confidence’. While there is strong evidence for the existence of BSA (see Fischhoff, 1982, for example), our experiment particularly focuses on the *co-existence* of BSA and overconfidence, and the extent to which the two are related. While it is plausible that one feeds on the other (one might, for example, describe overconfidence as forward-looking – predicting that one will outperform other people – while biased self-attribution is backward-looking—self-congratulation on having outperformed other people), it is important to note that the two do not have to occur together. For example, overconfidence might be the effect of an overly optimistic outlook, as we suggest below.

Our principal findings are that both forms of overconfidence and BSA exist; that the two types of overconfidence do not appear to be correlated; and that there are marked and reasonably stable differences amongst individuals. Whilst there are no cross-cultural or gender differences in the degree of BSA, we find, in line with Yates and Lee (1996),

² They find that it is primarily the better-than-average effect that leads to more trading.

³ We thank an anonymous referee for this suggestion.

and Yates et al. (1996, 1997, 2002), that Asians are more confident than the British. We therefore conjecture that high Asian overconfidence is more likely to be due to underweighting of downside risk (i.e. unrealistic optimism, as in Roll, 1986; Kahneman and Lovallo, 1993; Camerer and Lovallo, 1999, and Heaton, 2002), rather than a higher sense of self-worth.⁴ This view is supported by the work of Ito (1990), Kleinhesselink and Ross (1991), Weber and Hsee (1998), and Keown (1989),⁵ and is also consistent with data on the Hofstede, 1980, Uncertainty Avoidance Index⁶ (UAI): the UAI scores for Hong Kong and China are amongst the lowest in the world, which indicates that these societies are least averse to risk-taking.

The paper proceeds as follows. In Section 2 we describe the game, discuss our measures of overconfidence and describe our tests. We present and discuss our results in Section 3, and conclude in Section 4.

2. Experimental design

2.1. Stock-market game (testing referential overconfidence and BSA)

The participants were 111 third-year undergraduates doing a course in International Economics or Finance. 18 were Asian, predominantly from China or Hong Kong, and 68 were British. Each started with a notional £1 million and split this equally between any two assets chosen from a set of 13 assets of varying levels of risk (the set included some exchange traded funds, some UK quoted stocks and some currencies, including sterling). Each weekend, for 20 weeks, we valued the portfolios at closing market prices (with dividends or interest added as appropriate, and converting foreign currencies to sterling). Participants then re-allocated their portfolios equally between any two of the same 13 assets, entering their choices at a computer terminal of their choice. The values and rankings of the portfolios were reported both on the Internet and in lectures and the three students with the highest portfolio values at the end of the game won £100, £50 and £25, respectively.

When participants chose their portfolios we asked them two questions to measure referential overconfidence and BSA, respectively:

1. When we rank the *changes* in the values of all participants' portfolios resulting from this week's decisions, where do you think you will be ranked?
2. To what extent do you attribute your current position to your own skill and insight, rather than to luck or to other participants' skills?

2.2. Examination mark prediction (testing stand-alone overconfidence)

In a separate exercise, to assess stand-alone overconfidence, we asked participants to predict their end-of-year mark in the International Economics or International Finance exam. It is worth noting that at the end of the 2nd year the students had taken five or six 3-hour examinations that counted as about 50% of their degree class, ranging over Finance, Economics, Management Accounting and Financial Accounting. Both the students and the researchers knew the marks that they achieved in these exams.

2.3. Measuring overconfidence

For both the exam and the game predictions we need to establish the prediction that would be made by a person who is neither overconfident nor underconfident to establish a base level from which to measure overconfidence (see, for example, Gervais and Odean, 2001, where overconfidence is defined as confidence of a biased person divided by confidence of a rational person).

⁴ A 'Study of Hong Kong People's Participation in Gambling' by the Centre for Social Policy Studies of Hong Kong Polytechnic University, commissioned by the Home Affairs Bureau of the Hong Kong government, reported in March 2002 a 'prevalence of pathological gambling in Hong Kong' (Section 3.5, p. 5) and that 'Pathological gamblers were in general over-confident of their skills and luck in winning, and tended to recall winning experiences and forget losing experiences' (Section 3.14, p. 6.).

⁵ Bontempo et al. (1997), find that the probability of a loss has a larger effect on risk as perceived by Westerners, but the magnitude of losses has a larger effect on risk as perceived by Chinese.

⁶ The UAI measures the level of tolerance for uncertainty and ambiguity within a society.

Question 1 is a typical ‘better-than-average’ effect question, so, in the spirit of that type of study, one possible ‘rational’ prediction by student i of the rank of next week’s change in portfolio value (henceforth $\text{RNKCH}_{i,w+1}$) is the median rank, defining overconfidence of student i at trade t as:

$$\text{CONF1}_{i,t} \equiv \text{predicted RNKCH}_{i,w+1} - \text{median rank}$$

Note that this is simply a linear transformation of predicted rank, so for this definition there is no difference between confidence and overconfidence. It is possible that a subject consistently predicts *and achieves* a higher-than-median rank, in which case the confidence is not misplaced and is not a sign of overconfidence.⁷ Our second measure of overconfidence at trade t is, therefore:

$$\text{CONF2}_{i,t} = \text{predicted RNKCH}_{i,w+1} - \text{achieved RNKCH}_{i,w+1}$$

The set of information provided by the game increases each week. This allows us to calculate a more sophisticated measure of overconfidence based on information that becomes available to subjects and could be useful in producing a prediction. We take the information set available each week and investigate whether there is any variable that is highly correlated with next week’s RNKCH. The most obvious possibilities are current rank and the mean RNKCH to date. We estimate the following regressions:

$$\text{RNKCH}_{i,w+1} = a_1 + b_1 \text{RNK}_{i,w} + \varepsilon_w$$

$$\text{and RNKCH}_{i,w} = a_2 + b_2 \text{MEANRNKCH}_{i,w} + \eta_w$$

where $\text{RNK}_{i,w}$ is student i ’s rank in week w and $\text{MEANRNKCH}_{i,w}$ is the student’s mean RNKCH up to and including week w . The results were as follows (with t -statistics in parentheses):

$$\text{RNKCH}_{i,w+1} = \underset{(19.39)}{36.9} + \underset{(12.18)}{0.336} \text{RNK}_{i,w}$$

$$\text{RNKCH}_{i,w+1} = \underset{(15.51)}{64.2} - \underset{(-1.73)}{0.119} \text{MEANRNKCH}_{i,w}$$

We therefore chose $\text{RNK}_{i,w}$ as our third ‘base’ level from which to measure overconfidence at trade t , defining:

$$\text{CONF3}_{i,t} = \text{predicted RNKCH}_{w+1} - 36.9 - 0.336 \times \text{RNK}_{i,w}$$

Note that these measures are all measures of referential overconfidence, and that in all cases a positive CONF_x ($x = 1, 2, 3$) implies overconfidence.

From the exam mark predictions we derived two measures of stand-alone overconfidence:

$$\text{CONF4} = \text{predicted result} - \text{actual result}$$

$$\text{CONF5} = \text{predicted result} - 36.0 - 0.492 \times \text{average of second-year exam results}$$

The first of these is equivalent to CONF2 in the game, while the second is equivalent to CONF3, in that past exam results are a good source of information for predicting the final exam result. The definition of CONF5 comes from a regression of the actual result on the average of 2nd year exam results, in which the independent variable had a coefficient of 0.492, with a t -statistic of 5.24 and the constant term was 36.0 with a t -statistic of 7.35.

2.4. The relationship between overconfidence and gender and/or nationality

We first estimate regressions to examine the relationships between gender and nationality, and overconfidence. (All regressions involving data on individual trades were estimated using a Huber and White robust variance estimator adjusted for clustering of observations by participant.)

⁷ Although the average value of CONF1 across the group indicates whether the group is overconfident on average.

We estimate the following equations:

$$\text{CONF } x_{i,t} = \alpha_1 + \beta_1 \text{MAN}_i + \xi_{1,t} \quad (1)$$

$$\text{CONF } x_{i,t} = \alpha_2 + \beta_2 \text{AS}_i + \xi_{2,t} \quad (\text{for British and Asians only}) \quad (2)$$

$$\text{CONF } x_{i,t} = \alpha_3 + \gamma_1 \text{BRITMAN}_i + \delta_1 \text{ASMAN}_i + \phi_1 \text{ASWOMAN}_i + \xi_{3,t} \quad (\text{for British and Asians only}) \quad (3)$$

$$\text{CONF } x_{i,t} = \alpha_4 + \gamma_2 \text{BRITMAN}_i + \xi_{4,t} \quad (\text{for British only}) \quad (4)$$

$$\text{CONF } x_{i,t} = \alpha_5 + \delta_2 \text{ASMAN}_i + \xi_{5,t} \quad (\text{for Asians only}) \quad (5)$$

$\text{CONF } x_{i,t}$ is one of the confidence measures. For $x = 1, 2$ or 3 , the ‘ t ’ subscript identifies each trade. When $x = 4$ or 5 there are no trade subscripts, since these relate to the exam predictions;

$\text{MAN}_i = 1$ if participant i is male;

$\text{AS}_i = 1$ if participant i is Asian; and

BRITMAN_i , ASMAN_i and ASWOMAN_i are dummy variables identifying British men, Asian men and Asian women, respectively.

2.5. Biased self-attribution

Our next set of regressions examines the relationships among BSA, confidence, nationality and gender. We estimated the following equations:

$$\text{SKILL}_{i,t} = A_1 + B_1 \text{RNK}_{i,t} + v_{1,t} \quad (6)$$

$$\text{SKILL}_{i,t} = A_2 + C_2 \text{CONF } x_{i,t} + v_{2,t} \quad (7)$$

$$\text{SKILL}_{i,t} = A_3 + B_3 \text{RNK}_{i,t} + C_3 \text{CONF } x_{i,t} + v_{3,t} \quad (8)$$

$$\text{SKILL}_{i,t} = A_4 + B_4 \text{RNK}_{i,t} + C_4 \text{CONF } x_{i,t} + D_4 \text{AS}_i + v_{4,t} \quad (\text{for British and Asians only}) \quad (9)$$

$$\begin{aligned} \text{SKILL}_{i,t} = & A_5 + B_5 \text{RNK}_{i,t} + C_5 \text{CONF } x_{i,t} + E_5 \text{BRITMAN}_i + F_5 \text{ASMAN}_i + G_5 \text{ASWOMAN}_i \\ & + v_{5,t} \quad (\text{for British and Asians only}) \end{aligned} \quad (10)$$

where $\text{SKILL}_{i,t}$ is the participant’s answer to question 2 in the game (the higher it is, the more the current rank was attributed to the subject’s skill).

2.6. Stability of confidence measures over time

We first establish whether students tend to exhibit different levels of overconfidence from one another by applying a Kruskal–Wallis test for each of the three types of referential confidence measures. This is preferable to the more commonly used ANOVA comparison, since it does not assume homogeneity of variance across students.

We then investigate whether each student’s level of overconfidence varies over time or is relatively stable. Whereas most studies that investigate whether individuals exhibit stable characteristics do so by comparing scores in two tests, Jonsson and Allwood (2003), study whether subjects display similar characteristics on tests administered three times with 2 weeks between each session. They do this by calculating the correlations between the characteristics displayed in the tests delivered at the different times. However, this simply indicates whether the rank order of students is similar from one period to the next. Our data consist of up to 20 trades per student over the 20 weeks of the game, and this allows us to carry out more precise tests of stability in the three referential confidence measures.

We test stability over time by taking the trades for each individual student and splitting them in half. The first half are trades that were done earlier in the session and the second half trades that were done later. For those students who had at least eight trades we then carry out an unpaired t -test comparing the mean in the first half with the mean in the second half.

Table 1
Summary statistics of the five overconfidence measures

	Mean	Median	S.D.	Min.	Max.
CONF1	5.19**	7.50	30.36	−55.50	56.50
CONF2	4.48**	2.00	46.34	−109.00	110.00
CONF3	4.16**	5.86	29.21	−69.52	64.41
CONF4	4.37**	3.00	8.41	−10.00	54.00
CONF5	4.09**	3.50	5.30	−7.85	29.93

** Indicate significance at 1%.

3. Results and discussion

3.1. Confidence levels and correlations between measures

Table 1 presents summary statistics suggesting that, on average, participants were overconfident on *all* measures. The mean overconfidence measures vary between about 4 and 5, and all are significant at above 1%. This confirms work in other areas: there is a strong tendency towards overconfidence, both about one's own performance in absolute terms and in comparison with others'.

Table 2 shows the correlations among the overconfidence measures, which contrast with the consistency displayed in Table 1: while all the correlations are positive, the correlations between the referential and stand-alone confidence measures are between about 5% and 10%, suggesting that the two characteristics are manifestations of different personality types. This supports our argument, that one should be cautious in using evidence of one type of overconfidence to motivate models which assume the existence of the other.

3.2. The relationship between overconfidence and gender and/or nationality

Table 3 presents the results where CONF3 and CONF5 are the dependent variables. Those for CONF1, CONF2 and CONF4 were similar, so for conciseness we do not present them. The results provide weak evidence that men were more overconfident than women in the game: the coefficient on MAN in Eq. (1) is slightly significantly positive; in Eq. (3), where British and Asian men are treated separately, it appears that the overconfidence is coming from the Asian men; while in Eq. (4), which was estimated for British participants only, there is some evidence that British men are more confident than British women.

This contrasts strongly with the CONF5 results, where there is no evidence of any difference between the confidence of men and that of women. British men were more overconfident than British women in their predictions in the game, but not in predictions of exam results, while Asian men and women were equally overconfident in all respects. (The results of estimating Eq. (5) suggest that there is no difference between the confidence of Asian men and women, whichever measure of confidence is used.)

There is also a strong contrast between the evidence for cultural differences, as opposed to gender differences, in overconfidence measures. There is very strong evidence that Asians were significantly more overconfident than the British: in estimates of Eqs. (2) and (3), which compare the two cultures, the coefficients on Asian participants are positive and significant at a minimum of 5% for the CONF3 regression; and the results are similar, although not as strong for Asian women, in the CONF5 equation.

Table 2
Correlations among the five overconfidence measures

	CONF1	CONF2	CONF3	CONF4	CONF5
CONF1	1				
CONF2	0.6883	1			
CONF3	0.9282	0.7167	1		
CONF4	0.1047	0.0886	0.1285	1	
CONF5	0.0463	0.0614	0.1001	0.6949	1

Table 3
The relationship between overconfidence and gender and/or nationality

	Dependent variable: CONF3				
	Eq. (1)	Eq. (2)	Eq. (3)	Eq. (4)	Eq. (5)
MAN	7.57 (1.65)				
AS		10.62 (2.74)**			
BRITMAN			7.95 (1.47)	13.15 (2.30)*	
ASMAN			19.03 (3.23)**		6.52 (1.15)
ASWOMAN			12.52 (2.03)*		
Constant	−0.981 (−0.25)	0.61 (0.24)	−4.68 (−1.02)	−9.88 (−1.99)*	7.83 (1.86)
(Adjusted) R^2	0.015	0.020	0.036	0.044	0.013
	Dependent variable: CONF5				
	Eq. (1)	Eq. (2)	Eq. (3)	Eq. (4)	Eq. (5)
MAN	0.87 (0.68)				
AS		4.52 (2.96)**			
BRITMAN			0.60 (0.40)	1.42 (1.12)	
ASMAN			6.11 (2.73)**		2.69 (0.54)
ASWOMAN			3.43 (1.39)		
Constant	3.46 (3.12)**	3.29 (4.92)**	2.84 (2.20)*	2.03 (1.82)	6.27 (3.75)**
(Adjusted) R^2	−0.007	0.098	0.086	0.005	−0.058

t-Statistics are in parentheses. * and ** indicate significance at 5% and 1%, respectively.

3.3. Biased self-attribution

Table 4 presents the results of estimating Eqs. (6)–(10) with CONF3 and CONF5 as the independent variables. As before, results using CONF1, CONF2 and CONF4 were qualitatively similar, so we do not present them.

The estimates of Eq. (6) produce a highly significant coefficient on the RANK variable, which strongly suggests that participants were prone to BSA: the higher the rank, the greater is the participant's attribution of that rank to their own skill. The results of the other equations in the table suggest that for the game-based confidence measures (CONF3), but not exam-based ones (CONF5), there is a strong positive relationship between overconfidence and skill attribution. This might present a clue to the lack of correlation between these two types of confidence: BSA appears to be linked to referential overconfidence, as modelled in Gervais and Odean (2001), but not to stand-alone overconfidence. However, the estimates of (9) and (10) suggest no difference in BSA between Asians and British, or between men and women. Since referential overconfidence is significantly higher in Asians, it appears that BSA cannot be its only cause.

3.4. Stability of confidence measures over time

3.4.1. Kruskal–Wallis test

Here the null hypothesis is that the students come from the same population, or, more precisely, that their mean rankings in an overall ranking of overconfidence measures are the same. For all three confidence measures the null hypothesis was strongly rejected with *p*-values of 0.0001, confirming results elsewhere, that there are measurable differences of confidence levels between individuals.

3.4.2. Unpaired *t*-tests

Table 5 summarises the results of the unpaired *t*-tests comparing each student's mean overconfidence for the first half of the session with that for the second half. For all three measures of overconfidence the mean *p*-value across all the tests was around 0.4, with a median of between 0.3 and 0.5, showing that, in general, we cannot reject the null hypothesis that there is no difference between overconfidence in the two halves: that is, there is stability over time. However, for a minority of students (around 10–20% of the subjects) there does seem to be a shift in overconfidence. This seems to be a promising avenue for future research: are there certain personality traits which cause some students to exhibit more stability than others?

Table 4

Biased self-attribution: dependent variable, $SKILL_{i,t}$

	Eqs. (6)	Eqs. (7)		Eqs. (8)		Eqs. (9)		Eqs. (10)	
		Independent variable: CONF3	Independent variable: CONF5	Independent variable: CONF3	Independent variable: CONF5	Independent variable: CONF3	Independent variable: CONF5	Independent variable: CONF3	Independent variable: CONF5
CONF _x		0.23 (4.03)**	0.30 (0.70)	0.25 (4.74)**	0.39 (0.84)	0.19 (3.31)**	0.21 (0.41)	0.18 (3.17)**	0.16 (0.28)
RANK	0.20 (3.06)**			0.23 (3.87)**	0.21 (3.09)**	0.23 (3.82)**	0.21 (3.04)**	0.23 (3.86)**	0.22 (3.18)**
AS						6.16 (1.02)	5.94 (0.72)		
BRITMAN								4.02 (0.74)	6.64 (1.15)
ASMAN								14.50 (1.42)	16.53 (1.29)
ASWOMAN								2.91 (0.48)	4.56 (0.73)
Constant	29.48 (6.56)**	40.99 (17.11)**	38.04 (11.66)**	27.06 (6.29)**	25.49 (4.70)**	23.89 (5.03)**	22.88 (3.96)**	21.29 (3.73)**	18.21 (2.77)**
R ²	0.049	0.053	0.0038	0.118	0.063	0.112	0.074	0.123	0.092

t-Statistics are in parentheses. * and ** indicate significance at 5% and 1%, respectively.

Table 5
Stability of traits across individuals

	CONF1	CONF2	CONF3
Mean <i>p</i> -values across all students	0.40	0.43	0.43
Median <i>p</i> -values across all students	0.33	0.39	0.48
% significant at $\leq 1\%$	13	0	9
% significant between 1% and 5%	7	7	7

The table summarises the *p*-values of unpaired *t*-tests comparing mean overconfidence in the first half of the trades with mean overconfidence in the second half of the trades, for those students who traded at least eight times.

4. Conclusion

Behavioural finance models are increasingly based on the assumption that financial decision makers have irrational characteristics. We have presented evidence on one of these broad characteristics—overconfidence. We have distinguished between two types of overconfidence, namely stand-alone and referential overconfidence. Our evidence comes from the responses of students to a multi-period stock-market game.

Our principal findings are these. First, our results strongly confirm the finding of other studies mentioned in Section 1 concerning the existence of overconfidence: we find strong evidence of both stand-alone and referential overconfidence. But we also find evidence to support the view expressed in Glaser et al. (2005), quoted earlier: the different measures of overconfidence do not appear to be correlated. This finding confirms the argument of Glaser and Weber (2007), that it may be misleading for models of financial behaviour to use evidence of one type of overconfidence to justify the existence of another.

Our data allow us to test for stability in participants' overconfidence: our results suggest that for the majority of participants their levels of overconfidence are stable, although there is a sizeable minority whose confidence levels appear to vary over time. We also find significant differences between participants' levels of overconfidence. In particular, we find strong evidence for both measures that Asians are more overconfident than British participants.

Our tests on biased self-attribution suggest that the increased confidence of the Asians is not because of inflated views of their own abilities, since there is no difference between the BSA characteristics of the British and the Asians. One possibility is that Asian overconfidence arises from over-optimism and/or underweighting of downside risk. As mentioned in Section 1, the finance literature suggests that where participants are overconfident financial markets are likely to have higher price volatility and trading activity. So, whatever the reason for it, if our finding that Asians have a greater tendency to overconfidence is correct, then, *ceteris paribus*, Asian financial markets are more likely to exhibit price volatility and high trading activity.

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