Entrepreneurship: Cause or Consequence of Financial Optimism?

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September 2012

Abstract

Extant evidence that the self-employed overestimate their returns by more than employees do is consistent with two mutually inclusive possibilities. Self-employment may generate optimism or optimists may be drawn to self-employment. This paper finds that employees who will be self-employed in the future overestimate their short-run financial wellbeing by more than those who never become self-employed. When actually self-employed they are even more optimistic. Employees aspiring to start their own business are also of above average optimism. Cross-sectional findings are therefore an amalgam of psychological disposition and environmental factors, as theory requires if optimism is to be a causal influence on entrepreneurship.

Keywords: Financial optimism, expectations, self-employment

JEL Classification: D84, M13

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Acknowledgement: We very much appreciate comments from George Bulkley, Vikram Pathania, Steve Pischke, Diane Reyniers, Yona Rubinstein, two referees and an associate editor.

"The presumptuous hope of success seems…..to entice so many adventurers into those hazardous trades, that their competition reduces their profit below what is sufficient to compensate the risk" Adam Smith, Wealth of Nations (1796), Book 1, Chapter 10.

1. Introduction

Most governments encourage entrepreneurship on the assumption that it is unequivocally a good thing, promoting market competition, innovation and economic growth. For individuals, the attractions of self-employment include personal autonomy, the opportunity to take risk for financial reward, life-style flexibility and tax avoidance (e.g. Scheinberg and McMillan, 1988; Dennis, 1996; Amit et al., 2001; Douglas and Shepherd, 2002; Cassar, 2007). If, as Hamilton (2000) finds, the average income of the self-employed is lower, or as Moskowitz and Vissing-Jorgenson (2004) report, starting a business involves higher risk but lower expected returns than for stock market investment, these may be prices worth paying. As long as nascent entrepreneurs appreciate the trade-offs, there is no particular cause for concern. However, accumulating evidence, reviewed in the next section, suggests that the self-employed overestimate their prospects by more than employees do. This does not necessarily mean that the choice of self-employment involves error. Those selecting self-employment may have an optimistic disposition, in which case they will also tend to overestimate their prospects in paid employment. If the returns to both are overestimated to the same extent, the choice between employment modes will be the same as if expectations are realistic. It is only if individuals are more optimistic about self-employment than paid-employment that entry will be excessive. As planning and running a new business are activities that involve a high perception of self-control and offer few barriers to fantasy, they may be breeding grounds for optimism.

This paper seeks to determine the extent to which the relative optimism of the self-employed reflects their intrinsic psychology or is a side effect of planning and running a new business. If intrinsic optimism is a cause of entrepreneurship, not only must entrepreneurs have an optimistic disposition, bu being an entrepreneur must also give more scope for optimism, as noted by de Meza and Southey (1996)

To investigate these matters, this paper uses longitudinal data on a large sample of individuals in the UK tracked annually since 1991. This data source is rich in the sense that it allows sequential observation of financial expectations, financial realizations and transitions into and out of self-employment. However, as explained in the paper, the categorical nature of the data presents various research challenges.

The main findings of the paper are that those who will enter self-employment display higher than average financial optimism while in paid employment and are even more optimistic when self-employed. The remainder of the paper is structured as follows. Section 2 describes the background to the questions, identifies some problematic research issues, and proposes strategies to address them. Section 3 describes the longitudinal data source and develops the empirical methodology. This is applied in section 4. Section 5 provides final discussion and conclusions. An appendix presents alternative empirical approaches.

2. Background and development of research issues

There is no completely settled definition of an entrepreneur. Someone who starts a business that employs others is certainly an entrepreneur. Nevertheless, this is not entirely

distinct from what, say, a self-employed literary agent does. In this paper, self-employed status is used as an indicator of entrepreneurship. This measure is practical, but may be too inclusive. The accountant with a private practice and an office over a shop is not a hero of creative destruction, though as Adam Smith said of the family grocer, "He must have all the knowledge, in short, that is necessary for a great merchant, which nothing hinders him from becoming but the want of sufficient capital." (Wealth of Nations, Book. 1, Ch. 10). The self-employed are typically residual income recipients and willingness to embrace this role suggests they have much in common with narrower definitions of entrepreneurs. Self-employment is the most commonly used measure of individual entrepreneurial status where researchers rely on secondary analysis of existing data (e.g. Amit et al. (1995), Burke et al. (2000), Evans and Leighton (1989), Parker (2009) Puri and Robinson (2007), Taylor (1996), Van Praag and Cramer (2001)). While recognising the limitations, 'self-employed' and 'entrepreneur' are used interchangeably in the discussion.

One characteristic of entrepreneurs for which there is accumulating evidence is that they overestimate the financial returns to starting a business (see Parker 2009 for a survey). For example, Cooper, Woo, and Dunkelberg (1988) find that the mean estimate by entrepreneurs of the probability that their own business will survive is well in excess of the mean realised probability. According to Landier and Thesmar (2009), entrepreneurs tend to overestimate employment expansion and sales growth. These studies do not, however, compare the optimism of entrepreneurs with the general population, leaving the question open as to whether higher optimism is really an intrinsic characteristic of those whose choose self-employment.[1] Perhaps optimism is equally the province of those in paid employment.

[1] Optimism is taken here as forecasts biased in the favorable direction as opposed to overconfidence, interpreted as excessive forecast precision. (It is therefore logically possible to be an overconfident pessimist.). Hvide (2002) terms what we define as optimism, overconfidence, and what we denote as overconfidence, as

After all, optimism has been identified as one of the most widespread of behavioural biases (De Bondt and Thaler (1995, p. 389)). At first sight, cross-section studies suggest that entrepreneurs do indeed have higher levels of optimism. For example, Arabsheibani et al. (2000) find that the self-employed overestimate their financial prospects by more than those in paid employment. Puri and Robinson (2007, 2009) use subjective longevity estimates to measure the relative optimism of the self-employed. Although the self-employed expect to live about six months longer than those in paid employment, applying actuarial adjustments for smoking, education and race, they will die eight months sooner on average. So the self-employed are lifespan optimists..[23]

Although thestudies are of considerable interest, they do not address whether the observations arise because increased optimism is a consequence of entrepreneurship. Almost everyone may think that starting a successful business is more lucrative than it really is.[4] On this view, optimism is not a characteristic of the type of person attracted by entrepreneurship but the creation of the noisy, unpredictable environment, in which the self-employed typically operate. For example, Kahneman and Tversky (1979) identify the 'planning fallacy', that is the tendency of people engaged in complex projects to regard best case scenarios as the most

overconfidence. However Parker (2009) is clear that over-optimism refers to over-estimation of the probability of success, whereas over-confidence is under-estimation of the degree of variation in outcomes. Busenitz and Barney (1987) and Forbes (2005) measure overconfidence by examining the proportion of estimates to trivia questions, such as the length of the Nile, that fall outside self assessed confidence intervals. Business founders are more confident than their managers.

[2] No adjustment is made for being an entrepreneur. It is possible entrepreneurs really do live longer. For example, Kuper and Marmot (2003) finds that taking orders is bad for life expectancy, a burden avoided by the self-employed. In their later paper (2009) Puri and Robinson show comparisons between entrepreneurs and the general population, and highlight significant differences in behavior between moderately and extremely optimistic entrepreneurs, for example in terms of work effort.

[3] Fraser and Greene (2006), using British data for the period 1984-99, find that the self-employed have higher income expectations than employees, but the difference diminishes with experience. Data on income realizations are not available in their study, so it is possible that expectation differences are justified.

[4] Astebro (2003) finds inventors have very negative expected returns. Nevertheless, they persist in seeking commercialization even after receiving credible external advice against doing so (Astebro et al., 2007). The latter studies also finds inventors score higher on tests of optimistic attitudes than do the general population. These results are distinctly interesting, though for present purposes subject to qualification. Inventors may be extreme, forecast errors are not measured and it is possible beliefs are adopted post commitment as

likely outcome. Explicit planning actually makes the problem worse, encouraging an 'insider' view which places greater weight on internal operational activity than on shocks originating in the external market. By contrast, 'outsiders' place greater weight on typically realised performance, perhaps by paying closer attention to external information about actual realizations of other entrepreneurs. Consistent with this, Cassar (2010) finds that business start-ups which have gone through a formal planning process have the *least* realistic forecasts. Entrepreneurs as insiders in an uncertain environment where illusions of control flourish and complex planning is required may be situated in an optimism incubator.

One way to address the question of whether entrepreneurial optimism is acquired or intrinsic is to compare the financial optimism of people in paid employment who never become self-employed (hereafter '*nevers*') with those currently in paid employment who subsequently become self-employed (hereafter '*futures*') those in their last period in wage employment (so the forecast is for the first period of self-employment) ('*switchers-in'*), and those in their last year of self-employment ('*switchers-out'*) and if they revert to self-employment ('*pasts'*). These groups further contrast with those currently in a spell of self-employment which has lasted for one than one year and which will last for at least one further year ('*selfs*') Since measurements of forecasts and realizations are taken in a common environment, differences should reflect dispositional financial optimism.

There is though an important qualification to this conclusion. If the transition into self-employment is the result of a history of disappointing outcomes in paid employment, *futures* may be recorded as relatively optimistic in the sense that their forecast errors are higher than average, but this is the consequence of rational learning (in the spirit of Jovanovic, 1982) rather than of heterogeneous psychology. Although rational expectations

implies that the expected forecast error is zero irrespective of individual characteristics and history, this does not mean that the expected error conditional on future decisions is zero. Suppose, for example, that everyone initially enters paid employment believing they will most likely earn the average of those with the same educational background and other observable characteristics. An individual doing worse faces a signal extraction problem. A poor realization could be the consequence of a bad draw or may be because (unobservable) intrinsic ability is below average for those with similar observables. If learning is rational, a run of poor realizations should lead to a downward revision of the ability prior and hence of expectations. It may then be worth trying a different way of earning a living, such as self-employment. According to this explanation, the prior optimism of *futures* is associated with worse realizations and forecasts that are no better than those of *nevers* and gradually become worse.[5] If decision making is rational, post transition into self-employment, the expected forecast error would be zero.[6]

In summary, if those entering self employment are characterised by greater intrinsic optimism, two features should be present. First, those who will be self-employed in the future should over forecast their returns relative to those who will never be self-employed. Second, if this apparent optimism is not (entirely) due to rational learning, the future self-employed should have significantly higher expectations, not just lower realizations. Both of these features readily lend themselves to empirical investigation.

[5] An alternative rational learning story is that someone who enjoys a good realization run concludes that they are better than average and decides, in the absence of a better paid employment match, to become self-employed as returns are more closely attuned to ability. This though implies that *futures* would be recorded as less optimistic than *nevers*.

[6] If expectations are rational the unconditional forecast error of those with worse past realizations should be zero. In fact the data used in this paper reject this strongly. Furthermore, the unconditional error of those entering self employment should be zero.

3. Data source and descriptive analysis

The data is from the British Household Panel Survey (BHPS). This is a nationally representative general purpose survey funded by the UK Economic and Social Research Council, and similar in structure to the US Panel Study of Income Dynamics and the German Socio-Economic Panel. A stratified random cluster sample of households is drawn from the population of British household postal addresses in Great Britain.[7] The original sample of 5000 households (approximately 12000 individuals) was recruited in 1991, and follow-on rules are established to track newly forming households involving originally-enumerated household members.[8] The survey instrument is a questionnaire involving a household section, and individual sections, covering a range of topics including economic activity and finances, administered to all adult household members (including new household members at each wave). Repeat interviews take place annually, with 18 annual waves currently available to researchers.

Self-employment in the UK is defined by tax status – that is, registered with the tax authority as an own-account worker or business owner with approval to pay income tax (and social security contributions) through an end of year assessment, rather than through the UK 'pay-as-you-earn' (PAYE) system. The BHPS asks individuals to self-report their employment status, thus identifying self-employment on this basis. *Switchers* and *futures* are identified by those who report that their full-time or main economic status changes.

[7] The far north of Scotland is excluded because of the prohibitive sampling costs. The original survey excludes Northern Ireland. Booster samples for Wales and Scotland recruited in 1999 and a sample for Northern Ireland recruited in 2001 are excluded from the analysis.

[8] Sample attrition rates in the BHPS are generally low and certainly comparable to those achieved in other similar household panels. As is typical with household panels the highest attrition rate of individuals was between Waves 1 and 2 (12%). Attrition between Waves 2 and 3 was 7% of the original individuals and subsequently averaged 2.4% of the original sample between waves. In common with nearly all previously published research using this data source, attrition is assumed to be a random event.

Switchers-in and *–out* are those who report a transition into or out of self-employment between the present and the next year. *Futures* are those who report further in the future a change into self-employment.[9] Those who never enter self-employment are identified as *nevers*.

From Wave 8 of the survey (1998/9) onwards, all economically active adults are asked about their entrepreneurial aspirations as part of the following question:

> '*I am going to read out a list of things which you may or may not want to happen to your current employment situation. For each one can you please tell me whether you would like this to happen to you in the next twelve months. Would you like to … start up your own business (a new business)*?'

Aspires are identified as those currently in paid employment who in the year of forecast answer in the affirmative; *non-aspires* are those who answer in the negative. This question is specifically about start-ups so accords with narrow definitions of entrepreneurship.

The BHPS allows individual optimism to be investigated by information contained within two questions asked of all individuals in each year. These are:

> *'Looking ahead, how do you think you yourself will be financially a year from now; better than you are now, worse than you are now, or about the same?'* (*forecast*)

and

> '*Would you say that you yourself are better off, worse off or about the same financially than you were a year ago?*' (*realization*)

[9] A small number of transitions into part-time self-employment alongside full-time or part-time paid employment are excluded from the *futures* and *switchers* groups.

Matching the first question asked at year *t* with the second question asked at year *t+1* provides forecast and the realization of that forecast.

What subjects understand by being well off financially is not straightforward. A further question asks subjects to attribute the main reason for the change. For those with improved realisations, 67% report that an earnings increase is the main reason, followed by 12% who report a fall in outgoings. There is a close match between *nevers* and *futures* but for *selfs* only 63% name earnings as the main factor. For those experiencing worse realisations, 49% report that the reason is higher outgoings, whereas 29% report lower earnings. Again, *futures* and *nevers* are very similar but 41% of *selfs* report lower earnings and 35% higher outgoings. In judging intrinsic optimism, the source of the change in finances is not obviously relevant. In assessing whether experiencing self-employment affects optimism, it is earnings changes that really matter. Brown and Taylor (2006) compare responses to these questions with real and nominal changes in actual income. The results reassuringly report consistency between an individual's forecasting accuracy and the actual changes in their financial situation, and suggest that individual perceptions square with what happens to actual finances.

To the extent the realization report is a noisy measure of income change, it will be harder to detect optimism change associated with status transitions. It is not obvious that that personal expenses should fluctuate more for the self employed so changes in optimism when people move status is likely to reflect changes in their income assessment. As on the upside income changes are reported as less important for *selfs* and on the downside more important. This suggests that our subsequent analysis underestimates how optimism changes when people become self employed.

Tables 1a and 1b provide descriptive statistics on the BHPS data. Means and standard deviations are reported for available individual-year observations on two sample partitions: firstly *aspires* and *non-aspires*, and secondly *futures*, *switchers-in, selfs, switchers-out, pasts* and *nevers*. The financial forecasts of *futures* exceed the *nevers* but realizations are rather similar. *Selfs* have higher forecasts than *futures* but also lower realizations. *Aspires* have higher expectations than *non-aspires* but also better outcomes. Note that the mean 5-point scale forecast error is in the optimistic direction for all groups but *non-aspires* and *nevers* are the least optimistic by some way, followed by *switchers out, pasts, futures, switchers-in, aspires,* and *selfs*.[10] The rest of the paper investigates whether this optimism ranking can be taken at face value.

The remainder of Table 1 provides descriptive statistics for a set of control covariates which will be used in the econometric analysis: age, gender, marital status and highest education. It is of note that *aspires* and *futures* tend to be slightly younger, and that *non-aspires* and *nevers* are much more likely to be female, reflecting the lower proportion of women amongst the stock of self-employed in the UK.

Educational attainment is captured in the analysis through a series of dummy variables indicating the highest level of attainment. These are: university or college degree level at undergraduate or postgraduate level; other non-degree higher education including some historic teaching qualifications and nursing qualifications; A-levels or equivalent (post-compulsory examinations taken at 18 as qualifying exams for college or university entrance),

[10] *Nevers* are identified as never being self-employed during the sample period. Some may enter self-employment later, in which case the tendency is to under record the extent of the optimism difference with *futures*.

GCSE or O-levels (age 16 schooling attainment qualifications); and no formal qualifications. *Nevers* are less likely to have higher educational qualifications.

4. Econometric strategy

Optimism is self-serving prediction bias. People systematically overestimate how well off they will be. A natural procedure to measure whether optimism differs between groups is therefore to construct forecast error as the difference between individual expectation and realization. Denote i's forecast at $t-1$ of their income at t as F_{it} and the realization at t as R_{it}. Initially, suppose both are continuous variables.. Defining forecast error as $E_{it} \equiv F_{it} - R_{it}$., the rational expectation, $\bar{F}_{it}$, satisfies $R_{it} = \bar{F}_{it} + e_{it}$ where e_{it} is a random error with mean zero reflecting the various shocks that can intervene between the forecast and realisation. It therefore follows that $E_{it} = (F_{it} - \bar{F}_{it}) - e_{it}$. Forecast error is an unbiased but noisy estimate of optimism. The central test therefore appears to be whether the mean forecast error of *futures* significantly differs from *nevers.*

In the present context, there are three problems with this procedure;

i) Suppose that individuals learn about their productivity over time. Initially, they assume that they resemble their peers and so forecast average returns. As experience flows in, individuals update their estimate of their intrinsic ability. This involves a signal extraction problem. A poor realization may be bad luck or reflect low ability so it is rational to downgrade expectations, though by less than the shortfall in realizations. Those experiencing a run of poor realizations will therefore be recorded as optimists. After a while, they downgrade their expected returns in paid employment by so much they try self-employment. On average,

futures are therefore measured as optimistic relative to *nevers,* despite both groups being equally rational. The potential problem is that *futures* are created by subsequent forecast error. In effect, the label is awarded for being an optimist. This rational learning possibility can though be rejected if *futures* have significantly higher realizations.[11]

It is worth making the rational learning issue explicit with a stylized illustration. Let there be equal numbers of two types of risk-neutral people, As and Bs. If an A enters paid employment they earn 100 whereas a B earns 50. In self-employment, both types have expected earnings of 60. At the outset people do not know their type. Everyone is risk neutral and has rational expectations. A working life comprises two periods. In the first, everyone chooses paid-employment in which expected earnings are 75, exceeding the 60 in self-employment. As earnings in paid-employment reveal type, in the second period all Bs switch to self-employment and all As remain in paid-employment. When asked to forecast income, subjects report expected value. Measured by forecast error, *futures* are therefore all optimists and *nevers* are pessimists, despite everyone having rational expectations. Come the second round, everyone is a realist.

Note that the problem identified here does not arise with *aspires* because the classification is made simultaneously with the forecast rather than retrospectively.

ii) As realizations may be subject to large idiosyncratic shocks they are noisy estimates of bias. Detecting between-group differences in optimism may therefore

[11] The mirror case is if people do better than average, upgrade their estimate of their ability and then switch to self-employment where they believe reward is more closely related to ability. Rational learning of this sort makes *futures* appear relative pessimists but this is not observed in our data.

be difficult. There is a better way. Define a new error measure, $\overline{E_{it}} = F_{it} - \overline{R_t}$ where $\overline{R_t}$ is the mean realization of the group to which the individual belongs. It follows that averaged over the group, E_{it} equals $\overline{E_{it}}$, but the latter has lower variance if $varR_{it} > 2covR_{it}F_{it}$. This inequality certainly holds if forecasts are random or if the variation in realizations is mostly due to random shocks. In effect, the E_{it} measure assumes the rational expectation is the actual realization and $\overline{E_{it}}$ assumes that the appropriate forecast is the group mean. The difference does not affect the point estimate of bias but its precision. $\overline{E_{it}}$ is normally the appropriate measure if the objective is to detect differences in bias between groups.

iii) When the forecast error procedure is applied to categorical data of the BHPS type, a potential data truncation bias arises. As in Das and van Soest (1997), Arabsheibani et al. (2000) Souleles (2004) and Balasuriya, Muradoglu, and Ayton (2010), forecasts and realizations could be cardinalized on three-point scales from which a five-point measure of forecast error can be constructed. It is then tested whether the mean of this measure differs between groups. To illustrate why this can give rise to misleading results, suppose that for *futures* the most likely outcome is *better,* so this is their rational forecast. Nevertheless, because outcomes are stochastic, *same* and *worse* are sometimes realized. On average, futures will therefore be recorded as optimists. Similarly, *nevers* may rationally predict worse in which case they will be measured as pessimists on average. It may therefore be falsely concluded that *futures* are significantly more optimistic that *nevers* despite both having rational expectations.

To avoid these three problems in estimating forecast bias, a two-stage procedure is proposed. At the first-stage, a fixed-effect regression is run of realization at $t+1$ on time varying employment status dummies, past realizations age and year dummies.[12] The fitted values from this equation are the rational expectations. At the second-stage, forecast at *t* is regressed on the fitted values, employment status (with *nevers* as the excluded variable), the other time varying variables and some time invariant variables of interest. This is a more sophisticated version of using the group mean as discussed in *ii).* The primary interest is in the employment status variables.

A number of specific points should be made concerning this procedure. At the second-stage, the role of the fitted values is as a control. If everyone is equally optimistic, all those with the same fitted value should make the same forecast, therefore the difference in forecast by group measures relative optimism. The problems of categorical data are sidestepped. This does not apply to the coefficient on the rational expectation. The only restriction imposed by rationality is this coefficient should not be negative.[13]

Forecast is not included at the first-stage. Its inclusion potentially creates bias. Say that *futures* have on average lower fixed effects. Also, performance is increasing in expectations (as will be true if forecasts have some rationality). It follows by construction that at any given level of predicted performance, the *nevers* must have higher average

[12] The problems with nonlinear fixed effects models (e.g. Greene (2004)) lead us to use a linear formulation albeit that the cardinalization that outcomes involve equal increments is somewhat arbitrary.

[13] Suppose two groups. The best performers have a 40% chance of *better* 30% *same* and 30% *worse*. Their expected performance on a 1,0,-1 scale is 0.1. All these rationally forecast *better*. The worst performers have a 30% chance of *better* 30% *same* and 40% *worse*. Their expected performance on a 1,0,-1 scale is -0.1 and all rationally forecast *worse.* So a change of 0.2 in performance generates a change in forecast of 2, a coefficient of 10. If the two groups had chance of *better* of 40% and 50% performance differs but not forecast, so the coefficient would be zero.

expectations. At the second stage, the *futures* would therefore be found to be more optimistic, but this is an artefact of the procedure when *futures* are included at the first-stage.[14]

In the case of *futures,* there is a problem in drawing conclusions concerning their relative optimism if this group has lower realisations than *nevers* (as revealed by the average first-stage fixed effects of the groups). Under these circumstances the optimism of the *futures* could be due to rational learning. There are ways round this. If the apparent optimism of *futures* is due to rational learning that their ability is relatively low, inclusion of lagged realizations at the first stage should at least in part control for this. People with same history should draw the same conclusions about their ability and therefore display the same measured optimism even if learning is present. Second, if the optimism of *futures* is due to learning, their expectations should not be significantly higher than *nevers*. So when testing for the relative optimism of *futures,* the procedure is supplemented with a separate test of expectations. If futures are more optimistic according to the two-stage test and their expectations are higher, their intrinsic optimism is higher.[15]

The Appendix presents alternative methods of estimating differences in optimism and discusses their merits and drawbacks. All procedures yield similar conclusions.

5. Results

[14] Adding forecasts to the first stage has negligible effect on its explanatory power and the fitted values.
[15] Separately estimating the expectation and realization equations is more straightforward than using the two-stage procedure. The problem is if it is impossible to reject that *futures* or some other optimistic group perform better. This issue is further discussed in the Appendix.

Table 2 reports the first stage of the procedure for the *aspires* and *futures* samples. These are fixed-effect, linear realization equations. Column (1) compares *aspires* with *non-aspires* and shows that there is no significant difference in the financial realizations of the two groups. Column (2) compares groups on the basis on self-employment status and transition. *Switchers-out* have the highest realizations, and the difference is statistically significant. They are followed in order by *pasts* and *selfs*. In column (2), once we control for differences between these groups, we also find that a positive association between previous and current realization, as indicated by the negative coefficients on 'same' and 'worse'.[16] To measure inter group performance differences, the fixed effects are retrieved and regressed on the time-invariant group dummies with standard errors bootstrapped. Results for this are reported in Table 3. These results show significant differences in dispositional optimism between *aspires* and *non-aspires* (column 1) and between *nevers* and other groups who may have been self-employed, are self-employed, or may become self-employed (column 2).

The second-stage expectation regressions, from which optimism conclusions are derived, are the first two columns of Table 4 where the rational expectation control is the fitted values of the first-stage realization equation.[17] Standard errors are bootstrapped and are clustered in order to take account of multiple observations per individual. The coefficients on the various time-varying and invariant variables measure differential optimism.[18] To gauge

[16] The regressions in Table 2 include a lagged dependent variable, albeit in a categorical form. In panel data, where the number of time observations is particularly low, there is the possibility of bias in the coefficient estimates. However in the present case the average number of observations per individual is 7. Furthermore the purpose of the model in Table 2 is to provide estimates of realizations rather than inference, and to test differences in averages between groups. There is no reason to believe that any bias would affect particular groups differently.

[17] Alternative specifications such as entering the fitted values in quadratic form to allow for non linear effects, the inclusion of interaction terms hardly affect the final optimism estimates, so for ease of interpretation the simpler form is reported.

[18] An alternative procedure runs fixed-effects regressions at both stages, retrieves the second stage fixed effects and then runs them on the group dummies. This yields very similar results. Finally, a pooled first-stage probit

the magnitude of optimism effects, note that on average about a third of forecasts are *better.* Suppose that optimism increaes. Some of those predicting *same* now forecast *better* and some previously forecasting *worse* upgrade their forecast to same. Suppose 10% of those not already forecasting *better* change their expectations. The effect of this is to raise the expectation measure by approximately 0.066 and the number forecasting *better* increases by some 16%.

Our primary concern is with differences in optimism between the different sample groups. However, before these are discussed, we briefly describe other significant optimism effects, revealed in the other covariate coefficient estimates that are incidental to the main themes of the paper. Firstly optimism declines with age. Secondly men are significant more optimistic than women. This supports previous research (Puri and Robinson, 2007; Arabsheibani et al. 2000). Again, although statistically significant, the effect is not large. Thirdly being married is associated with lower optimism, supporting previous cross-sectional research. The magnitude of this effect is almost exactly the same in size, but with the opposite sign, as that for males. So unmarried males are most optimistic; married females are least optimistic. Fourthly a higher level of educational attainment is associated with lower optimism. Coefficient estimates vary somewhat across the reported specifications. Generally speaking someone with a university degree or college diploma (HND/HNC) reports lower forecast than someone with no educational qualifications. Lower levels of educational attainment are generally not statistically significant. Finally, optimism is higher following a good realization in the previous period, as indicated by the significant negative coefficient estimates at the foot of the table on the 'same' and 'worse' realization categories.

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can be run at the first-stage to generate rational expectation probabilities to be used as controls in a second-stage expectation probit. Again, results are similar.

Both second-stage equations show strong evidence that expectations are at least qualitatively rational in the sense that those with most reason to have above average forecasts according to the first-stage equation, are actually more likely to have higher forecasts.[19]

The main focus of the paper involves comparison of optimism by employment status and aspirations. From the first column of Table 4, employees who aspire to start a business are more optimistic than those who do not. According to the second column of Table 4, *nevers* are significantly less optimistic than all other groups. As *futures* have significantly worse realisations than *nevers,* according to Table 3, their apparent optimism could be due to rational learning. If this were the case, *futures* should not have significantly higher expectations than *nevers*. The final two columns of Table 4 are OLS expectation equations with employment status dummies but no rational expectations control.[20] As *futures* do have significantly higher expectations, it can be concluded that their optimism is not down to rational learning.

Previous studies have found that the self-employed are more optimistic about their financial prospects than employees. Our key finding is that their optimism predates their entry into self-employment. The financial optimism of the self employed is therefore not (entirely) a consequence of being self-employed but in some measure a dispositional trait.

[19] Due to the categorical data, rational expectations do not imply that the coefficient on the fitted values is unity. An increase in expected performance may not justify any increase in the most likely outcome or a large change.
[20] For most variables the coefficients in these equations are similar to the expectation without the performance control. This reflects the low coefficient on the performance control and the relatively small performance differences. Expectation differences are a good measure of optimism but this can only be determined by doing the two-stage exercise.

People who later become self-employed display more optimism whilst still in paid employment than those who never become self-employed. Those who express an aspiration to start a business are also more optimistic.

The next important issue is how optimism changes as people move in and out of self-employment. From Table 4 column 2, entrants to self-employment, the self-employed, those leaving self-employment and employees who have been self-employed in the past are all significantly more optimistic than *nevers.* That returners to paid employment are more optimistic is again evidence that intrinsic optimism is a factor in self-employment. *Switchers-in* are more optimistic than *futures* but the difference is not significant, possibly because there are relatively few entrant observations. *Selfs* are more optimistic than *futures* at the 5% level. *There is some evidence that the financial optimism of futures is greater when they are self-employed.* Although it has been ruled out that the relative optimism of *futures* is entirely due to learning effects, to the extent they are present, the effect of self-employment on optimisms is underestimated.

Overall, it seems that people who actually become self employed in the future or express a desire to do so are more optimistic concerning their financial prospects than those who remain in paid employment and are happy to do so. The most obvious explanation follows de Meza and Southey (1996). Optimists are attracted by activities that encourage optimism. For example, individual i's expected return in activity j is $E_{ij} = O_i C_J T_J$ where O_i is an index of I's optimism, C_J the optimism "capacity" of occupation j and T_J is the true return. Defining D_{jk} as the difference in the expected return to two activities, j and k, $\frac{\partial^2 D_{jk}}{\partial O_i \partial C_J} = T_J > 0$. Optimists are relatively attracted by the activity with the greatest optimism capacity. This potentially explains why optimism is higher for *futures* but it implies that their optimism

would become greater still when they become self-employed. As noted, there is some evidence that this is the case.

In this analysis optimism matters only because it influences the perception of economic variables. It is possible that optimism is associated with other personality traits that involve a taste for self-employment. Consider 'sensation seeking' defined by Zukerman (1994) as "a trait defined by the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experiences." (p.27) A taste for novelty may be associated with a propensity to give self-employment a go. Nicolaou et al (2008) find that this characteristic is heritable and entrepreneurs are indeed more likely to have it. In addition, Horvath and Zuckerman (1993) show that sensation seekers underestimate risk. So there is the possibility that the optimism of the self-employed is not a cause of optimism but a side product of the true driver, sensation seeking. This could be why the financial optimism of the self-employed is not detectably higher than when they were in paid employment. Some suggestive evidence is that sensation seekers tend to be smokers (Zuckerman, Ball, Black (1990)) and using the BHPS data, we found a strong positive correlation between smoking and financial optimism.

Whether or not sensation seeking plays a role in explaining the relation between optimism and self-employment, the finding that optimism precedes self-employment has important efficiency implications. Entry due to financial misperception depends on the difference in the optimism applied to paid and self-employment and that is certainly less than cross section estimates suggest.

6. Conclusions

This paper finds evidence that the self-employed overestimated their short-run financial prospects even when they were employees. Relative to equally well performing workers who remain in paid employment, employees who go on to become self-employed the proportion forecasting they will be be better off may be some 20% per cent higher. This is strong evidence that the dispositional optimism of the self-employed is higher. Consistently with this view, employees who aspire to start their own business are of above average financial optimism. As the desire to start a business is expressed prior to the measurement of optimism, the explanation cannot be rational learning.

Although the self-employed are not more optimistic merely by virtue of being self-employed, it does not follow that optimism is a cause of self-employment. This requires that optimists (mistakenly) expect to gain financially from switching to self-employment which in turn involves greater realism concerning prospective earnings in paid employment than in self-employment. There are *a priori* reasons for thinking the scope for wishful thinking concerning how well a new business will do is greater than when contemplating the returns to continuing in paid employment. Natural optimists are the most likely to be prone to such bias, so it is plausible that a track record of optimism in paid employment predicts future self-employment. We find some evidence that that people are even more optimistic when they are self employed than when employees indicating a direct effect of optimism on choice.

To the extent that optimism affects the assessment of the returns to both paid and self employment, the optimism bias may not give rise to such distorted entry decisions as may

initially appear.[21] So, although optimism may be a persistent characteristic of aspiring or intending entrepreneurs, even ignoring externalities, it may not be one that causes much mistaken entry. Although the results on whether self-employment increases optimism are not clear cut, what is unequivocal is that cross-section comparisons of the optimism of employees and the self-employed exaggerate the extent of the error. In this context, two wrongs do tend to make a right.

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[21] The fact that 30% of those entering self-employment exit within a year does though indicate error may be involved (Henley 2007).

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Appendix

Alternative methods of comparing the optimism of the various groups are reviewed here and the corresponding estimates presented. All find that *futures* are significantly more optimistic than *nevers* but evidence that the optimism of futures changes when they enter self-employment is weaker.

A natural procedure is to separately estimate the expectation and realisation equations. If the group of interest have significantly higher expectations but lower realisations it is more optimistic. Call this method M1. The problem is that unless it can be ruled out that the realizations of the high expectation group are not better no conclusion can be drawn. This is due to the categorical data. If in one group everyone correctly estimates the probabilities of *worse* is 40% and the others as 30% each, they all forecast *worse.* In another group the probabilities of *better* is 40% with the other outcomes 30% each, so all forecast *better.* The expected outcomes only differ by 0.2, but the expectations by 2. At first sight, the second group is more optimistic, but this is an artefact of the categorical data.

To see whether the combinations that allow conclusions to be drawn apply in this data (augmented to include subjects not observed in paid employment), pooled probit realization and expectation regressions including employment status dummies are run. Table A1 reports the result. A one-tailed test rejects that *futures* have better realisations. As the expectation equation shows that *futures* have higher expectations, it can be concluded that they are more optimistic than *nevers.* For *aspires* and other groups, M1 is not applicable.

The second method, M2, involves the construction of forecast errors. Forecasts and realizations are coded on a three point scale thereby creating a five point forecast error scale.

As discussed in the text, there is a potential truncation error if the group found to be more optimistic has better realizations. From Table A2a this property does not apply to *futures* relative to *nevers* so the very significant difference between these two groups in Table A2b can be taken at face value. *Aspires* do not have significantly different realizations to *non-aspires* (Table A1). It therefore cannot be ruled out that the relative optimism of the *aspires* in Table A2a is due to truncation bias.

A third method, M3, estimates realization conditional on forecast, controls and group dummies with *nevers* the excluded group. If every group was equally optimistic the distribution of outcomes would be the same given the forecast, so if a dummy is significantly negative, that group is relatively optimistic. M3 estimates realization conditional on forecast whereas the text method, M4, estimates forecast conditional on rational expectation. These procedures are not of equal power. Consider an extreme illustration. Suppose that everyone basis expectations on irrelevant factors. So there is no correlation between forecasts and realizations. Nevertheless *futures* have higher expectations than *nevers,* but there is no significant difference between the groups in the determination of realizations. In this case M4 finds that given expected realization, *futures* have higher expectations; so are more optimistic. In contrast, M3 wrongly concludes there is no difference in optimism between the groups. Although *futures* are more likely to forecast *better,* whichever group such a forecast comes from, there will be no difference in the expected outcome. So M3 is a less direct and reliable estimator of optimism than M4.[22] Nevertheless, Tables A3a and A3b show that

[22] Suppose that the expectation formation process is $E_{it} = O_i f(R_{it}, a_{it})$ where a_{it} are factors unrelated to rational expectations and O_i is an optimism index. If two groups have the same distribution of R_{it} and a_{it} but differ in their distribution of optimism then M4 measures the difference in mean O. The mean change in R required to preserve E when optimism is higher (what M3 measures) depends on the nature of the f function and the joint distribution of R and a so will not necessarily equal the mean difference in O. Consider the following stylised example. Subjects must decide whether they are a G or B. knowing there are equal numbers of both types in the population. A ball is drawn with your letter on it but it's hard to read. An unbiased expert is hired to decipher the letter. An assessment is written specifying the most likely letter that is correct 75% of the time. A realist accepts the report's conclusion. A super optimist reviews the reports and converts Bs to Gs. So

futures are significantly more optimistic than *nevers* and *aspires* more optimistic than *non-aspires*.

for the optimist, 50% of claimed Gs really are. This is not so different to the realist's 50%. If the expert is always right optimism causes the accuracy of the forecast to fall from 100% to 50% but if the expert is no better than random optimism has no effect on the forecast conditional outcome.

Table 1a: Descriptive Statistics

Variable	Description	*Aspires* Mean	*Aspires* *Std. Dev.*	*Non-Aspires* Mean	*Non-Aspires* *Std. Dev.*
Financial forecasts and realizations					
Financial forecast (t):					
Better off	*Reference category*	0.473	0.499	0.342	0.474
Same		0.450	0.498	0.581	0.493
Worse off		0.077	0.267	0.077	0.266
3 point scale (*dependent variable*)	-1 if individual financial forecast 'worse off', 0 if 'same' and 1 if 'better off' at *t*	0.396	0.627	0.265	0.590
Financial realization (t+1):					
Better off	*Reference category*	0.392	0.488	0.340	0.474
Same		0.366	0.482	0.456	0.498
Worse off		0.242	0.428	0.204	0.403
3 point scale (*dependent variable*)	-1 if individual realised 'worse off', 0 if 'same' and 1 if 'better off' at *t*+1	0.150	0.782	0.136	0.725
Financial realization (t):					
Better off	*Reference category*	0.407	0.491	0.380	0.485
Same		0.365	0.481	0.440	0.496
Worse off		0.229	0.420	0.180	0.384
3 point scale	-1 if individual realised 'worse off', 0 if 'same' and 1 if 'better off' at *t*	0.178	0.777	0.199	0.721
Forecast error:					
5 point scale (*dependent variable*)	Range from -2 to +2 (Forecast *t* minus Realization *t*+1)	0.246	0.897	0.129	0.815
Demographics					
Age	Years	35.59	10.42	39.46	12.14
Age squared		1375.2	786.8	1704.7	1001.5
Male		0.628	0.483	0.472	0.499
Marital Status					
Married		0.486	0.500	0.582	0.493
Cohabiting		0.233	0.423	0.163	0.370
Widowed/divorced /separated		0.075	0.263	0.079	0.270
Single, never married	*Reference category*	0.206	0.404	0.175	0.380

Educational Attainment					
University degree		0.181	0.385	0.181	0.385
Other higher education		0.092	0.289	0.077	0.267
A-levels		0.223	0.417	0.224	0.417
O-Levels/GCSE's		0.378	0.485	0.364	0.481
No qualifications	*Reference category*	0.126	0.332	0.154	0.361
N		3688		28237	

Source: authors tabulations from BHPS 1991-2008

Table 1b: Descriptive Statistics

Variable	Description	*Nevers*		*Futures*		*Switchers In*		*Selfs*		*Switchers Out*		*Pasts*	
		Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*
Financial forecasts and realizations													
Financial forecast (t):													
Better off	*Reference category*	0.340	0.474	0.418	0.493	0.428	0.495	0.411	0.492	0.433	0.496	0.351	0.477
Same		0.559	0.496	0.479	0.500	0.466	0.499	0.525	0.499	0.492	0.500	0.575	0.494
Worse off		0.101	0.301	0.103	0.304	0.106	0.308	0.064	0.245	0.075	0.263	0.074	0.262
3 point scale (*dependent variable*)	-1 if individual financial forecast 'worse off', 0 if 'same' and 1 if 'better off' at *t*	0.239	0.619	0.315	0.649	0.322	0.657	0.347	0.596	0.358	0.617	0.276	0.591
Financial realization (t+1):													
Better off	*Reference category*	0.334	0.472	0.366	0.482	0.374	0.484	0.308	0.462	0.391	0.488	0.320	0.467
Same		0.433	0.495	0.368	0.482	0.349	0.477	0.475	0.499	0.417	0.493	0.466	0.499
Worse off		0.233	0.423	0.266	0.442	0.277	0.448	0.216	0.412	0.192	0.394	0.214	0.410
3 point scale (*dependent variable*)	-1 if individual realised 'worse off', 0 if 'same' and 1 if 'better off' at *t*+1	0.102	0.746	0.099	0.789	0.097	0.802	0.092	0.718	0.199	0.738	0.106	0.723
Financial realization (t):													
Better off	*Reference category*	0.366	0.482	0.414	0.493	0.331	0.471	0.347	0.476	0.321	0.467	0.360	0.480

Same		0.424	0.494	0.351	0.477	0.424	0.495	0.443	0.497	0.417	0.493	0.460	0.498
Worse off		0.210	0.407	0.235	0.424	0.245	0.430	0.210	0.407	0.262	0.440	0.180	0.385
3 point scale	-1 if individual realised 'worse off', 0 if 'same' and 1 if 'better off' at *t*+1	0.157	0.743	0.179	0.785	0.086	0.754	0.137	0.734	0.059	0.762	0.180	0.713
Forecast error:													
5 point scale (*dependent variable*)	Range from -2 to +2 (Forecast *t* minus Realisation *t*+1)	0.138	0.837	0.216	0.900	0.225	0.905	0.254	0.834	0.160	0.865	0.171	0.845
Demographics													
Age	Years	38.4	12.1	35.1	10.4	37.7	11.2	43.7	11.8	40.9	11.5	43.2	11.3
Age squared		1619.2	984.0	1340.5	772.4	1546.6	897.0	2048.3	1075.0	1801.7	998.8	1990.8	1035.8
Male		0.467	0.499	0.606	0.489	0.637	0.481	0.671	0.470	0.632	0.483	0.639	0.480
Marital Status													
Married		0.589	0.492	0.541	0.498	0.568	0.496	0.663	0.473	0.640	0.480	0.693	0.461
Cohabiting		0.144	0.351	0.170	0.376	0.203	0.403	0.134	0.341	0.168	0.374	0.137	0.344
Widowed/divorced /separated		0.079	0.270	0.056	0.231	0.067	0.249	0.076	0.264	0.070	0.255	0.084	0.278
Single, never married	*Reference category*	0.188	0.391	0.233	0.423	0.162	0.369	0.127	0.333	0.122	0.328	0.085	0.280
Educational Attainment													
University degree		0.154	0.361	0.198	0.399	0.203	0.403	0.165	0.371	0.199	0.399	0.173	0.378
Other higher education		0.075	0.264	0.091	0.287	0.079	0.270	0.074	0.261	0.098	0.297	0.091	0.287
A-levels		0.205	0.404	0.237	0.425	0.219	0.414	0.251	0.434	0.239	0.427	0.228	0.420
O-Levels/GCSE's		0.373	0.484	0.306	0.461	0.326	0.469	0.305	0.461	0.309	0.463	0.337	0.473

No qualifications	*Reference category*	0.192	0.394	0.168	0.374	0.173	0.378	0.206	0.404	0.155	0.362	0.171	0.377
N		51999		3700		556		2911		614		2422	

Source: authors tabulations from BHPS 1991-2008

Table 2: Fixed Effect Linear probability regression for financial realizations (first stage equation)

	(1) Realizations *t*+1		(2) Realizations *t*+1	
Variable	Coefficient	P>z	Coefficient	P>z
Aspires	-0.011	0.529	-	-
Switchers In	-	-	-0.019	0.608
Selfs	-	-	0.060	***0.024***
Switchers Out	-	-	0.159	***0.000***
Pasts	-	-	0.079	***0.014***
Demographics				
Age	0.003	0.895	0.019	0.184
Financial Realizations time t (reference category: 'better')				
'Same'	0.044	***0.000***	-0.046	***0.000***
'Worse'	0.111	***0.000***	-0.053	***0.000***
Observations	31925		62202	
F test	22.12		15.57	
(p-value)	***0.000***		***0.000***	

Notes: All regressions are clustered by individual and include year dummy variables (coefficients not reported). *Italic* indicates significance level (p-value) below 0.10, ***bold italic*** below 0.05

Table 3: Linear probability regression of fixed effects from Stage 1 (Table 2)

	(1*) Fixed Effects from (1)		(2*) Fixed Effects from (2)	
Variable	Coefficient	P>z	Coefficient	P>z
Aspires	0.0318	***0.004***	-	-
Nevers	-	-	0.0648	***0.000***
Observations	31925		62202	
Chi^2	8.29		18.72	
(p-value)	***0.004***		***0.000***	
Adjusted R^2	0.000		0.002	
Root MSE	0.458		0.511	

Notes: Standard errors are bootstrapped and clustered by individual. *Italic* indicates significance level (p-value) below 0.10, ***bold italic*** below 0.05

Table 4: Linear probability regression for financial forecasts conditional on predicted realizations (second stage equation)

	(1) Forecast *t*		(2) Forecast *t*		(3) Forecast *t*		(4) Forecast *t*	
Variable	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
Predicted financial realizations at *t*+1	0.260	***0.000***	0.313	***0.000***	-	-	-	-
Aspires	0.072	***0.000***	-	-	0.069	***0.000***	-	-
Futures	-	-	0.050	***0.001***	-	-	0.042	***0.005***
Switchers In	-	-	0.078	***0.009***	-	-	0.074	***0.006***
Selfs	-	-	0.145	***0.000***	-	-	0.148	***0.000***
Switchers Out	-	-	0.099	***0.000***	-	-	0.132	***0.000***
Pasts	-	-	0.063	***0.000***	-	-	0.064	***0.000***
Demographics								
Age	-0.009	***0.000***	-0.009	***0.000***	-0.010	***0.000***	-0.011	***0.000***
Male	0.044	***0.000***	0.036	***0.000***	0.051	***0.000***	0.043	***0.000***
Marital Status								
Married	-0.045	***0.002***	-0.035	***0.003***	-0.052	***0.000***	-0.036	***0.001***
Couple	0.002	0.834	0.033	***0.003***	0.005	0.735	0.035	***0.002***
Widowed/divorced/separated	-0.006	0.770	0.010	0.490	-0.012	0.524	0.002	0.906
Educational Attainment								
University	-0.032	***0.013***	-0.044	***0.000***	-0.011	0.475	-0.014	0.271
HND/HNC	-0.050	***0.019***	-0.035	***0.014***	-0.033	*0.092*	-0.015	0.354
A-level	-0.024	0.100	-0.030	***0.008***	-0.018	0.228	-0.022	*0.070*
O-levels/GCSEs	0.000	0.977	-0.004	0.718	0.001	0.920	-0.001	0.952
Financial Realizations time t (reference category: 'better')								
'Same'	-0.140	***0.000***	-0.136	***0.000***	-0.198	***0.000***	-0.206	***0.000***
'Worse'	0.008	0.503	-0.026	***0.001***	-0.095	***0.000***	-0.157	***0.000***
Observations	31925		62202			31925		62202
F-Test						138.57		156.74
Chi^2	4587.59		16422.99					

(p-value)	***0.000***	***0.000***	***0.000***	***0.000***
R^2	0.125	0.133	0.096	0.105
Root MSE	0.558	0.577	0.567	0.587

Note: Columns (1) and (2) report standard errors that are bootstrapped and clustered by individual. Columns (3) and (4) report clustered standard errors. All regressions include year dummy variables (coefficients not reported). *Italic* indicates significance level (p-value) below 0.10, ***bold italic*** below 0.05

Appendix

Table A1a: Ordered probit regression for financial realizations measured at time *t+1*

Variable	Coef.	P>z	MFX (Better)	P>z	MFX (Same)	P>z	MFX (Worse)	P>z
Aspires	-0.024	0.280	-0.009	0.278	0.002	0.259	0.007	0.284
Demographics								
Age	-0.005	0.227	-0.002	0.227	0.000	0.227	0.001	0.227
Age squared/100	-0.0049	0.271	-0.0018	0.271	0.0004	0.272	0.0014	0.271
Male	0.048	***0.001***	0.018	***0.001***	-0.004	***0.001***	-0.013	***0.001***
Marital Status								
Married	-0.076	***0.002***	-0.028	***0.002***	0.007	***0.003***	0.021	***0.002***
Couple	-0.003	0.909	-0.001	0.909	0.000	0.908	0.001	0.909
Widowed/divorced/separated	-0.060	*0.073*	-0.022	*0.070*	0.005	***0.042***	0.017	*0.079*
Educational Attainment								
University	0.131	***0.000***	0.049	***0.000***	-0.014	***0.000***	-0.035	***0.000***
HND/HNC	0.092	***0.003***	0.034	***0.004***	-0.010	***0.010***	-0.025	***0.002***
A-level	0.035	0.149	0.013	0.150	-0.003	0.166	-0.010	0.145
O-levels/GCSEs	0.007	0.733	0.003	0.733	-0.001	0.734	-0.002	0.733
Financial Realizations time t (reference category: 'better')								
'Same'	-0.357	***0.000***	-0.129	***0.000***	0.028	***0.000***	0.101	***0.000***
'Worse'	-0.632	***0.000***	-0.207	***0.000***	0.005	***0.025***	0.202	***0.000***
Cut 1	-1.426							
Cut 2	-0.166							
Log Likelihood	-32538.1							
chi² (p-value)	***0.000***							
Pseudo R^2	0.033							
N	31925							

Notes: All regressions are clustered by individual and include year dummy variables (coefficients not reported). *Italic* indicates significance level (p-value) below 0.10, ***bold italic*** below 0.05

Table A1b: Ordered probit regression for financial realizations measured at time *t+1*

Variable	Coef.	P>z	MFX (Better)	P>z	MFX (Same)	P>z	MFX (Worse)	P>z
Futures	-0.040	*0.074*	-0.014	*0.071*	0.002	*0.041*	0.012	*0.078*
Switchers In	-0.027	0.567	-0.010	0.565	0.002	0.531	0.008	0.571
Selfs	0.022	0.188	0.008	0.190	-0.001	0.211	-0.007	0.185
Switchers Out	0.123	***0.001***	0.045	***0.002***	-0.011	***0.012***	-0.035	***0.001***
Pasts	0.051	***0.014***	0.019	***0.015***	-0.004	***0.028***	-0.015	***0.012***
Demographics								
Age	-0.011	***0.000***	-0.004	***0.000***	0.001	***0.000***	0.003	***0.000***
Age squared/100	0.0010	0.722	0.0004	0.722	-0.0001	0.722	-0.0003	0.722
Male	0.032	***0.003***	0.012	***0.003***	-0.002	***0.003***	-0.010	***0.003***
Marital Status								
Married	-0.043	***0.010***	-0.015	***0.010***	0.003	***0.013***	0.013	***0.010***
Couple	0.018	0.315	0.007	0.317	-0.001	0.334	-0.005	0.313
Widowed/divorced/separated	-0.050	***0.033***	-0.018	***0.031***	0.003	***0.012***	0.015	***0.035***
Educational Attainment								
University	0.152	***0.000***	0.056	***0.000***	-0.013	***0.000***	-0.043	***0.000***
HND/HNC	0.078	***0.001***	0.029	***0.001***	-0.006	***0.003***	-0.023	***0.000***
A-level	0.044	***0.009***	0.016	***0.009***	-0.003	***0.015***	-0.013	***0.008***
O-levels/GCSEs	0.012	0.403	0.004	0.403	-0.001	0.408	-0.004	0.402
Financial Realizations time t (reference category: 'better')								
'Same'	-0.358	***0.000***	-0.127	***0.000***	0.018	***0.000***	0.109	***0.000***
'Worse'	-0.666	***0.000***	-0.214	***0.000***	-0.009	***0.000***	0.223	***0.000***
Cut 1	-1.231							
Cut 2	-0.015							
Log Likelihood	-70459.3							
chi² (p-value)	***0.000***							
Pseudo R^2	0.040							
N	68659							

Notes: All regressions are clustered by individual and include year dummy variables (coefficients not reported). *Italic* indicates significance level (p-value) below 0.10, ***bold italic*** below 0.05

Table A1c: Ordered probit regression for financial forecasts measured at time *t*

Variable	Coef.	P>z	MFX (Better)	P>z	MFX (Same)	P>z	MFX (Worse)	P>z
Aspires	0.145	***0.000***	0.055	***0.000***	-0.038	***0.000***	-0.017	***0.000***
Demographics								
Age	-0.038	***0.000***	-0.014	***0.000***	0.009	***0.000***	0.005	***0.000***
Age squared/100	0.021	***0.000***	0.008	***0.000***	-0.005	***0.000***	-0.003	***0.000***
Male	0.105	***0.000***	0.039	***0.000***	-0.026	***0.000***	-0.013	***0.000***
Marital Status								
Married	-0.078	***0.013***	-0.029	***0.013***	0.019	***0.013***	0.010	***0.012***
Couple	0.028	0.376	0.010	0.377	-0.007	0.382	-0.004	0.370
Widowed/divorced/separated	0.000	0.994	0.000	0.994	0.000	0.994	0.000	0.994
Educational Attainment								
University	-0.011	0.728	-0.004	0.728	0.003	0.727	0.001	0.730
HND/HNC	-0.059	0.143	-0.022	0.138	0.014	0.128	0.008	0.158
A-level	-0.031	0.311	-0.011	0.309	0.007	0.305	0.004	0.318
O-levels/GCSEs	0.011	0.674	0.004	0.674	-0.003	0.675	-0.001	0.673
Financial Realizations time t (reference category: 'better')								
'Same'	-0.399	***0.000***	-0.145	***0.000***	0.092	***0.000***	0.054	***0.000***
'Worse'	-0.197	***0.000***	-0.071	***0.000***	0.043	***0.000***	0.028	***0.000***
Cut 1	-2.831							
Cut 2	-0.935							
Log Likelihood	-26722.7							
chi² (p-value)	***0.000***							
Pseudo R^2	0.057							
N	31925							

Notes: All regressions are clustered by individual and include year dummy variables (coefficients not reported). *Italic* indicates significance level (p-value) below 0.10, ***bold italic*** below 0.05

Table A1d: Ordered probit regression for financial forecasts measured at time *t*

Variable	Coef.	P>z	MFX (Better)	P>z	MFX (Same)	P>z	MFX (Worse)	P>z
Futures	0.085	***0.005***	0.031	***0.006***	-0.019	***0.008***	-0.012	***0.003***
Switchers In	0.170	***0.000***	0.064	***0.001***	-0.041	***0.001***	-0.023	***0.000***
Selfs	0.236	***0.000***	0.089	***0.000***	-0.058	***0.000***	-0.032	***0.000***
Switchers Out	0.260	***0.000***	0.099	***0.000***	-0.066	***0.000***	-0.033	***0.000***
Pasts	0.162	***0.000***	0.061	***0.000***	-0.039	***0.000***	-0.022	***0.000***
Demographics								
Age	-0.033	***0.000***	-0.012	***0.000***	0.007	***0.000***	0.005	***0.000***
Age squared/100	0.0141	***0.000***	0.0052	***0.000***	-0.0030	***0.000***	-0.0022	***0.000***
Male	0.077	***0.000***	0.028	***0.000***	-0.016	***0.000***	-0.012	***0.000***
Marital Status								
Married	-0.057	***0.012***	-0.021	***0.012***	0.012	***0.013***	0.009	***0.012***
Couple	0.084	***0.000***	0.031	***0.000***	-0.019	***0.001***	-0.012	***0.000***
Widowed/divorced/separated	0.030	0.333	0.011	0.335	-0.007	0.343	-0.004	0.324
Educational Attainment								
University	-0.015	0.540	-0.006	0.539	0.003	0.536	0.002	0.543
HND/HNC	-0.014	0.644	-0.005	0.644	0.003	0.641	0.002	0.647
A-level	-0.038	*0.092*	-0.014	*0.090*	0.008	*0.085*	0.006	*0.097*
O-levels/GCSEs	0.000	0.984	0.000	0.984	0.000	0.984	0.000	0.984
Financial Realizations time t (reference category: 'better')								
'Same'	-0.411	***0.000***	-0.148	***0.000***	0.082	***0.000***	0.066	***0.000***
'Worse'	-0.330	***0.000***	-0.116	***0.000***	0.058	***0.000***	0.057	***0.000***
Cut 1	-2.628							
Cut 2	-0.832							
Log Likelihood	-59554.8							
chi² (p-value)	***0.000***							
Pseudo R^2	0.059							
N	68659							

Notes: All regressions are clustered by individual and include year dummy variables (coefficients not reported). *Italic* indicates significance level (p-value) below 0.10, ***bold italic*** below 0.05

Table A2a: Ordered probit regression for forecast errors *(M2)*

Variable	Coef.	P>z	MFX (2)	P>z	MFX (1)	P>z	MFX (0)	P>z	MFX (-1)	P>z	MFX (-2)	P>z
Aspires	0.109	***0.000***	0.014	***0.000***	0.024	***0.000***	-0.010	***0.000***	-0.024	***0.000***	-0.004	***0.000***
Demographics												
Age	-0.0201	***0.000***	-0.0024	***0.000***	-0.0044	***0.000***	0.0014	***0.000***	0.0046	***0.000***	0.0007	***0.000***
Age squared/100	0.0173	***0.000***	0.0020	***0.000***	0.0038	***0.000***	-0.0012	***0.000***	-0.0039	***0.000***	-0.0006	***0.000***
Male	0.027	*0.051*	0.003	*0.051*	0.006	*0.051*	-0.002	*0.052*	-0.006	*0.051*	-0.001	*0.051*
Marital Status												
Married	0.017	0.472	0.002	0.471	0.004	0.472	-0.001	0.468	-0.004	0.472	-0.001	0.473
Couple	0.024	0.326	0.003	0.332	0.005	0.327	-0.002	0.348	-0.005	0.324	-0.001	0.318
Widowed/divorced/separated	0.054	*0.092*	0.007	0.104	0.012	*0.092*	-0.004	0.133	-0.012	*0.087*	-0.002	*0.077*
Educational Attainment												
University	-0.115	***0.000***	-0.013	***0.000***	-0.025	***0.000***	0.006	***0.000***	0.027	***0.000***	0.005	***0.000***
HND/HNC	-0.116	***0.000***	-0.013	***0.000***	-0.025	***0.000***	0.006	***0.000***	0.027	***0.000***	0.005	***0.001***
A-level	-0.052	***0.024***	-0.006	***0.021***	-0.011	***0.024***	0.003	***0.013***	0.012	***0.026***	0.002	***0.030***
O-levels/GCSEs	-0.001	0.950	0.000	0.950	0.000	0.950	0.000	0.950	0.000	0.950	0.000	0.950
Financial Realizations time t (reference category: 'better')												
'Same'	0.039	***0.007***	0.005	***0.007***	0.009	*0.007*	-0.003	***0.007***	-0.009	***0.007***	-0.001	***0.007***
'Worse'	0.393	***0.000***	0.056	***0.000***	0.084	*0.000*	-0.048	***0.000***	-0.081	***0.000***	-0.011	***0.000***
Cut 1	-2.548											
Cut 2	-1.275											
Cut 3	0.217											
Cut 4	1.193											
Log Likelihood	-38131.5											
chi² (p-value)	***0.000***											
Pseudo R²	0.011											
N	31925											

Notes: All regressions are clustered by individual and include year dummy variables (coefficients not reported). *Italic* indicates significance level (p-value) below 0.10, ***bold italic*** below 0.05

Table A2b: Ordered probit regression for forecast errors *(M2)*

Variable	Coef.	P>z	MFX (2)	P>z	MFX (1)	P>z	MFX (0)	P>z	MFX (-1)	P>z	MFX (-2)	P>z
Futures	0.086	***0.000***	0.011	***0.000***	0.019	***0.000***	-0.008	***0.001***	-0.019	***0.000***	-0.003	***0.000***
Switchers In	0.129	***0.004***	0.018	***0.008***	0.028	***0.003***	-0.013	***0.020***	-0.028	***0.002***	-0.005	***0.001***
Selfs	0.135	***0.000***	0.018	***0.000***	0.029	***0.000***	-0.013	***0.000***	-0.029	***0.000***	-0.005	***0.000***
Switchers Out	0.064	*0.081*	0.008	***0.096***	0.014	*0.081*	-0.006	0.129	-0.014	*0.075*	-0.003	*0.062*
Pasts	0.062	***0.003***	0.008	***0.005***	0.014	***0.003***	-0.005	***0.009***	-0.014	***0.003***	-0.002	***0.002***
Demographics												
Age	-0.013	***0.000***	-0.002	***0.000***	-0.003	***0.000***	0.001	***0.000***	0.003	***0.000***	0.001	***0.000***
Age squared/100	0.0083	***0.004***	0.0010	***0.004***	0.0018	***0.004***	-0.0006	***0.004***	-0.0019	***0.004***	-0.0003	***0.004***
Male	0.023	***0.028***	0.003	***0.028***	0.005	***0.027***	-0.002	***0.028***	-0.005	***0.028***	-0.001	***0.028***
Marital Status												
Married	0.000	0.978	0.000	0.978	0.000	0.978	0.000	0.978	0.000	0.978	0.000	0.978
Couple	0.041	***0.019***	0.005	***0.022***	0.009	***0.019***	-0.003	***0.029***	-0.009	***0.018***	-0.002	***0.016***
Widowed/divorced/separated	0.062	***0.006***	0.008	***0.008***	0.014	***0.006***	-0.005	***0.015***	-0.014	***0.005***	-0.002	***0.004***
Educational Attainment												
University	-0.134	***0.000***	-0.015	***0.000***	-0.029	***0.000***	0.008	***0.000***	0.031	***0.000***	0.006	***0.000***
HND/HNC	-0.076	***0.001***	-0.009	***0.000***	-0.017	***0.001***	0.005	***0.000***	0.017	***0.001***	0.003	***0.002***
A-level	-0.062	***0.000***	-0.007	***0.000***	-0.014	***0.000***	0.004	***0.000***	0.014	***0.000***	0.003	***0.000***
O-levels/GCSEs	-0.011	0.421	-0.001	0.420	-0.002	0.421	0.001	0.417	0.003	0.421	0.000	0.423
Financial Realizations time t (reference category: 'better')												
'Same'	0.027	***0.007***	0.003	***0.007***	0.006	***0.007***	-0.002	***0.007***	-0.006	***0.007***	-0.001	***0.007***
'Worse'	0.326	***0.000***	0.047	***0.000***	0.070	***0.000***	-0.037	***0.000***	-0.068	***0.000***	-0.011	***0.000***
Cut 1	-2.544											
Cut 2	-1.324											
Cut 3	0.124											
Cut 4	1.105											
Log Likelihood	-83630.6											
chi^2 (p-value)	***0.000***											
Pseudo R^2	0.010											
N	68659											

Notes: All regressions are clustered by individual and include year dummy variables (coefficients not reported). *Italic* indicates significance level (p-value) below 0.10, ***bold italic*** below 0.05

Table A3a: Ordered probit regression for realizations, conditional on forecasts *(M3)*

Dependent Variable: Realizations *t+1*								
Variable	Coef.	P>z	MFX (Better)	P>z	MFX (Same)	P>z	MFX (Worse)	P>z
Aspires	-0.048	***0.031***	-0.017	***0.030***	0.004	***0.019***	0.013	***0.034***
Demographics								
Age	0.0004	0.909	0.0002	0.909	0.0000	0.909	-0.0001	0.909
Age squared/100	-0.0001	0.115	0.0000	0.115	0.0000	0.116	0.0000	0.115
Male	0.032	***0.024***	0.012	***0.024***	-0.003	***0.025***	-0.009	***0.024***
Marital Status								
Married	-0.064	***0.009***	-0.023	***0.009***	0.006	***0.011***	0.017	***0.009***
Couple	-0.009	0.731	-0.003	0.731	0.001	0.728	0.002	0.732
Widowed/divorced/separated	-0.061	*0.062*	-0.022	*0.059*	0.005	***0.034***	0.017	*0.068*
Educational Attainment								
University	0.146	***0.000***	0.054	***0.000***	-0.016	***0.000***	-0.038	***0.000***
HND/HNC	0.109	***0.000***	0.041	***0.000***	-0.012	***0.002***	-0.029	***0.000***
A-level	0.045	*0.050*	0.017	*0.052*	-0.004	*0.063*	-0.012	***0.048***
O-levels/GCSEs	0.007	0.736	0.003	0.736	-0.001	0.737	-0.002	0.736
Financial Forecasts time t (reference category: 'better'								
'Same'	-0.340	***0.000***	-0.125	***0.000***	0.034	***0.000***	0.091	***0.000***
'Worse'	-0.901	***0.000***	-0.257	***0.000***	-0.054	***0.000***	0.311	***0.000***
Financial Realisations time t (reference category: 'better')								
'Same'	-0.298	***0.000***	-0.107	***0.000***	0.025	***0.000***	0.083	***0.000***
'Worse'	-0.600	***0.000***	-0.197	***0.000***	0.009	***0.000***	0.188	***0.000***
Cut 1	-1.509							
Cut 2	-0.217							
Log Likelihood	-31873.0							
chi^2 (p-value)	***0.000***							
Pseudo R^2	0.053							
N	31925							

Notes: All regressions are clustered by individual and include year dummy variables (coefficients not reported). *Italic* indicates significance level (p-value) below 0.10, ***bold italic*** below 0.05

Table A3b: Ordered probit regression for realizations, conditional on forecasts *(M3)*

Dependent Variable: Realizations *t+1*								
Variable	Coef.	P>z	MFX (Better)	P>z	MFX (Same)	P>z	MFX (Worse)	P>z
Futures	-0.057	***0.010***	-0.020	***0.009***	0.003	***0.002***	0.017	***0.011***
Switchers In	-0.058	0.223	-0.020	0.216	0.003	0.123	0.017	0.232
Selfs	-0.023	0.165	-0.008	0.163	0.001	0.141	0.007	0.168
Switchers Out	0.076	***0.049***	0.028	*0.053*	-0.006	*0.096*	-0.022	*0.042*
Pasts	0.021	0.303	0.008	0.305	-0.001	0.328	-0.006	0.299
Demographics								
Age	-0.006	***0.016***	-0.002	***0.016***	0.000	***0.016***	0.002	***0.016***
Age squared/100	-0.0003	0.908	-0.0001	0.908	0.0002	0.908	0.0001	0.908
Male	0.020	*0.050*	0.007	*0.050*	-0.001	*0.050*	-0.006	*0.050*
Marital Status								
Married	-0.033	***0.041***	-0.012	***0.042***	0.002	***0.046***	0.010	***0.041***
Couple	0.002	0.898	0.001	0.898	0.000	0.899	-0.001	0.898
Widowed/divorced/separated	-0.056	***0.014***	-0.020	***0.012***	0.003	***0.003***	0.017	***0.015***
Educational Attainment								
University	0.165	***0.000***	0.061	***0.000***	-0.014	***0.000***	-0.046	***0.000***
HND/HNC	0.085	***0.000***	0.031	***0.000***	-0.007	***0.001***	-0.024	***0.000***
A-level	0.054	***0.001***	0.019	***0.001***	-0.004	***0.002***	-0.016	***0.001***
O-levels/GCSEs	0.012	0.368	0.004	0.369	-0.001	0.374	-0.004	0.368
Financial Forecasts time t (reference category: 'better'								
'Same'	-0.337	***0.000***	-0.121	***0.000***	0.024	***0.000***	0.097	***0.000***
'Worse'	-0.830	***0.000***	-0.239	***0.000***	-0.054	***0.000***	0.293	***0.000***
Financial Realisations time t (reference category: 'better')								
'Same'	-0.294	***0.000***	-0.104	***0.000***	0.016	***0.000***	0.088	***0.000***
'Worse'	-0.611	***0.000***	-0.197	***0.000***	-0.004	***0.023***	0.201	***0.000***
Cut 1	-1.315							
Cut 2	-0.069							
Log Likelihood	-69074.9							
chi² (p-value)	***0.000***							
Pseudo R^2	0.059							

N	68659

Notes: All regressions are clustered by individual and include year dummy variables (coefficients not reported). *Italic* indicates significance level (p-value) below 0.10, ***bold italic*** below 0.05.