Comparing Expectations and Outcomes: Application to UK Data

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I INTRODUCTION

The advent of the rational expectations hypothesis (REH), which coincided with an increasing interest in optimising behaviour in economics, was a remarkable revolution in economic thinking following the Keynesian revolution of a half-century ago. As a result, numerous models and policy prescriptions based on the rational expectations hypothesis have been developed. Simon (1978) states, economics is not simply the study of the allocation of scarce resources, but increasingly the study of the *rational* allocation of scarce resources. As under the doctrine of rationality, expectations form a major part of the decision made in an economy. This paper tests to see whether the rational expectations hypothesis is the best available objective method for modelling the form that such individual expectations take based on the UK data.

Most previous rationality tests have used aggregated macro data or micro data for short sample periods only. However, aggregated data can lead to spurious rejections of rationality when agents' information sets differ[1], while micro data cannot efficiently average out forecast errors over a short time period even if individual forecasts are perfectly rational. For example, expectations that might have been rational *ex ante*, may not appear to be so rational *ex post*, because the sample might have, by chance, received some unexpectedly good shocks over the period. As a result, it is important to test rationality using micro data on expectations over long sample periods. Keane and Runkle (1990) and Bonham and Cohen (2001) argue that unbiased tests for rational expectations can only be undertaken using such survey data due to the existence of 'micro-heterogeneity'. This leads to a rejection of the rational expectations hypothesis with aggregate data even if expectations are rational at the individual level, since individuals make their forecasts using different information sets.

[1] M. P. Keane, D. E. Runkle 1990

The British Household Panel Survey (BHPS) is unique in containing 12 years' worth of individual and household data, where a great deal of information is known about respondents at the point when they make their forecasts. As a result, while twelve years might not be long enough, the BHPS allows us to directly identify the types of individuals whose expectations are structurally incorrect. Also, I can analyse the robustness of the results over time and such a result would be as significant as a finding of irrationality, because of the available limited datasets. This paper applies the panel facet of the BHPS to test more clearly than usual whether expectations are unbiased and efficient. I interpret the results by characterizing the type of shocks that hit different types of individuals over time. Such a characterization is of methodological interest, because both theoretical and empirical models are generally sensitive to the assumptions made about shock processes. In particular, many such models assume that "aggregate" shocks affect all respondents uniformly.

The rational expectations hypothesis does not argue that agents are always right in their expectations of future variables. Instead, the expectations error is held to be a random variable, which is uncorrelated with the other variables in the process and the information set available to the agent. Hence expectations errors are random, have a mean value of zero and a variance which is less than that associated with other models of forecasting. Thus, on average, rational expectations will be correct because the mean value of the expectations error is zero and this also means that rational expectation are the most efficient means of forming expectations, because such expectations errors have the property of minimum variance. Because of this, this chapter tests whether expectation errors are classical, in other words, whether they contain systematic components. For instance, over the sample period less educated individuals might, on average, have been optimistic about the future, and have received disproportionately positive shocks. Chamberlain (1984) and others have specified that systematic expectation errors can be a potential problem in estimating any rational expectation or forward-looking model using short panel data. This chapter uses direct measures of individual expectation errors derived from the BHPS to test this point

directly.

In empirical tests of life cycle models, direct information on respondents' future expectations is rarely used. Conversely this thesis uses the BHPS over the period 1991~2002 to directly compare survey information on what agents expect with *ex post* measures of what results: information on whether output is expected to increase, decrease or remain same over the next year is compared to similar information collected twelve months later on what actually happened. At first, this paper explores the characteristics of expectation errors, which is done by comparing expected and realized financial status changes, to test the rationality of expectations. It then investigates how people form their expectations by identifying the factors which significantly affect respondents' subjective attitude concerning their financial well-being.

The organization of this paper is as follows. Section II surveys related empirical studies. Section III presents the methodology for testing the rational expectations hypothesis. Section IV presents the results concerning the rationality of expectations by exploring the characteristics of expectations errors and identifies the factors which influence respondent's expectations. Finally, section V presents some concluding remarks.

II RELATED STUDIES

Numerous empirical studies have been done to support or refute the rational expectations hypothesis since Muth published his seminal article (Muth, 1961). For example, Mishkin (1983,p.157) presents robust evidence to justify the assumption of rational expectations in financial markets and commodity exchanges. However, these results only apply to specialised markets and do not mean that the rational expectations hypothesis can be seen as the way that expectations are formed across the economy as a whole. On the other hand, if no major favourable insights of rational expectations in other markets have abounded, those empirical studies that have claimed to disprove the

hypothesis have not been technically strong. For example, the Chow Test[2] has been used to test the REH by many economists but often their data fail to be consistent[3]. Also, Mullineaux (1978) found that results from the Chow Test were always opposite to those from alternative testing methods.

Maddala, Fishe, and Lahiri (1981), Gramlich (1983) and Batchelor (1986) tested the rationality of surveyed inflation expectations using the aggregated Michigan data. While these studies analysed quantitative questions about the future path of inflation (up/down/no change), the aggregation bias implies these individual rationality tests are not straightforward. Batchelor and Jonung (1989) examined micro-level data on respondents' subjective expectations using small Swedish panel data and over a short time period (twelve months) and found evidence of bias and inefficiency. Using latent variable models, Ivaldi (1992) rejects the hypothesis of rational expectation for the French manufacturing industry, while, Nerlove and Schuermann (1995;1997) use a similar model along with micro data from a sample of Swiss and UK firms, to reject the rational expectations hypothesis. The alternative hypotheses of adaptive and naive expectations are also rejected as well in these studies. Das *et al.* (1999) tested the rationality of income expectations using a relatively short Dutch dataset (1984-1988) and found that income expectations were on average too low relative to subsequent outcomes. However as has already noted, rationality may not to be required to average out over the course of only a single year. Indeed, Souleles (2001) argues that even five years might be too short a period to allow expectation errors to average out.

Furthermore, an interest in data derived from various household surveys and modelling the expectations of private households or individuals is increasing as economists consider decisions on consumption, savings, portfolio choice, investments in durable goods, labour supply, job search and fertility in many life cycle models. Guiso *et al.* (1992) and Domintz and Manski (1997) analyse Italian cross-sectional survey data on subjective income distributions and find that income uncertainty has a negative impact

[2] This uses the F-test to test for structural stability in an econometric model.
[3] For the Chow Test to be accurate the consistency criterion must be met.

on the proportion of a households portfolio held in risky assets. Hochguertel (1998) finds a similar result for the Netherlands. Alessie and Lusardi (1996) also used Netherlands panel data and found that while expected changes in income were significantly correlated with actual income changes, they did not find the expected negative relationship between savings and the predicted income change. Finally Das and Van Soest (1996) also used Dutch survey data to explain the relationship between expected income changes and previous income changes and the differences between income expectations and outcomes over the same time period. This found that many people are pessimistic about their future income prospects.

Consequently, an unresolved methodological issue raised in the tests of the validity of the REH is whether it is appropriate to test it at the micro level. Edward Prescott (1977) has argued that expectations are not observed directly, and economists cannot use survey data to test the REH. Instead, only some theory incorporating the REH can be tested, if it is consistent with observations. On the contrary, a number of economists[4] have found that survey data on prediction variables can be of assistance in the empirical modelling of economic behaviour and econometric forecasting. Arnold Zellner (1985) supports the use of micro and industry data in examining relationships suggested by macroeconomic research, while Herbert Simon (1979) and James Tobin (1980) support direct empirical testing of the REH. My own view is that if the survey evidence supports the REH, results derived under this assumption will be both more interesting and more demanding of serious attention. As a result, it is an appropriate and worthwhile activity to directly test the REH in this paper.

In sum, there are many problems that arise in empirical work concerned with expectations. No overall conclusion about whether expectations in the market are rational can be obtained from empirical work as it is so imperfect. There is no sufficiently strong evidence to completely disprove this hypothesis until it has been empirically falsified. Up till now, rational expectations are the best available models

[4] Owen Sauerlander (1955); Otto Eckstein, Patricia Mosser, and Michael Cebry (1984)

for economists to use to model economic expectations. They are efficient at a statistical level because they have an error term with a minimum variance and zero mean. Also the REH coincides perfectly with the concept of homo economicus[5] and of the utility-maximising individual. The main point to be made in this section is that the REH is not perfect, but it is the best available method that we have for modelling expectations if these expectations need to be incorporated into economic models. At least, it fits the loose economic criterion of rationality.

III METHODOLOGY

Before exploring the characteristics of financial expectations, this paper tests the rationality of respondents' financial forecasts, in particular their unbiasedness and efficiency, by analysing the properties of respondents' expectation errors. The approach to empirically investigating their rationality is to examine the determinants of the expectations errors between the financial expectation at time *t* and the corresponding outcome at time *t+1*. These results can also be interpreted as characterizing the shocks that, *ex post*, have hit different types of respondents over time because, up until now, in many models such shocks have been generally assumed to affect all respondents uniformly.

Unbiased expectations are those which have the same mean as the actual outcomes. There are three ways to test for the unbiasedness of financial expectations. First, many researchers assume that individuals have a perceived outcome probability distribution[6]. With the help of the assumption that the stated expected category is the modal category, or includes the median of the expected outcome distribution, it is possible to compare the probability of the outcome being worse than that expected with the probability of it turning out to be better than expected in terms of expectation errors. This leads to the use of nonparametric sign tests, which are used to test if the probability of falling into the single northeast cell significantly differs from the probability of falling into the

[5] It is a term used for an approximation or model of homo sapiens that acts to obtain the highest possible well-being for himself given available information about opportunities and other constraitns, both natural and institutional, on his ability to achieve his predetermined goals.
[6] For example, Das et al., 1999

single southwest cell. To use a nonparametric test, the categories 1 and 2 and the categories 4 and 5 are combined, and the middle (0's) responses are dropped by merging them into one of the other two responses (+1 or –1). Thus, the 5x5 forecast error tables are collapsed into 2x2 tables. The main problem with this is that dropping and merging categories may waste a good deal of information and that this approach makes it difficult to infer the individual or structural determinants of forecast errors. Second, expectation errors are parameterised by seeing their values (-2, -1, 0, 1, 2) as cardinal. This means that being two places off the diagonal is twice as bad as being one place off. This allows us to summarize the expectation errors by regressing the errors on a constant by the use of OLS. However, whichever way this is done means that we cannot conclude that respondents are generally over-optimistic or over-pessimistic uniformly across time. Alternatively, most previous studies have used time dummies to explain all systematic heterogeneity with the strong assumption that shocks hit all people uniformly. Instead, this paper only uses the time dummies as independent variables in regressions to test for any significant time effects in the expectation errors, $Fisite$, without cardinalizing them, which is suggested by Souleles (2001). The following equation (1) is estimated using the year dummies as independent variables.

$$Fisite_{it}^{*} = d'time_{it-1} + v_{it} \tag{1}$$

Where t (t = 1992,…,2002) refers to the second respondent interview in the BHPS data, *t-1* to the first interview. $Fisite_{it}^{*}$ denote expectations errors in the wave t.

Efficiency requires that expectation errors are uncorrelated with any variable in an agent's information set at the time of forecast; otherwise the forecast does not take advantage of all the available information. Efficiency is tested by looking for systematic demographic components in respondents' expectation errors. The focus is on cross-sectional heterogeneity, because there is such variation available in the BHPS data. Specifically, heterogeneity in expectation errors will be analysed by adding the demographic variable Z to equation (1) along with the full set of year dummies as

follows:

$$Fisite_{it}^{*} = a'time_{t-1} + b'Z_{it-1} + u_{it} \tag{2}$$

where *t*-1 refers the first respondent interview in the BHPS data and *t* to the second interview. Since the demographic variable Z_{it-1} is known to agent *i* at time *t*-1 of forecast, efficiency requires that $b' = 0$. *Fisite* is restricted to {-2, -1, 0, 1, 2} so the estimate is regressed by the random effects order probit model.

It is noted that, in this paper, we test the REH at the micro level by a presupposition that for market expectations to be rational all agents surveyed must be forming rational expectations. However, we know that hypothesis is based on the market, on average, having rational expectations. Thus, if our empirical test attacks on the REH at the micro level, we cannot take the result as absolute and reject the hypothesis. In fact, in life cycle models of individual behaviour, future expectations play an important role. Thus even if expectations based on every individual are not fully rational, they may still help forecast individual behaviour in relation to consumption or saving. This has lead to an increasing interest in data on, and the empirical modelling of, individual expectations. As a result, this paper also uses direct information on respondents' future financial status change expectations, which is different from the standard approach[7] found in the literature of inferring expectations from panel data on outcomes that leads to the assumption of rational expectations, to explore whether there is any evidence of micro-heterogeneity[8].

This paper used a random effects ordered probit model to investigate the characteristics of subjective data by describing the relationship between individual financial expectations, explanatory variables such as realized financial changes in the past and a set of demographical variables. To see whether different social groups have different financial change expectations, it includes various dummy variables.

[7] See the discussion in Guiso et al. (1992, 1996), Lusardi (1993), and Alessie & Lusardi(1996).
[8] Identifying the types of individuals who make the largest forecast errors and conversely to identify those individuals whose forecasts are the most accurate.

Furthermore, it explores in more detail sub-samples differentiated in terms of gender, marital status, education level and job status. Since much experimental evidence indicates that expectations depend on the status quo, current financial situations are excluded from regressions which, instead, involve two dummy variables derived from financial outcomes to understand their effects on respondents' expectation. It is assumed that these take the following stacked form:

$$Fisitx_{it}^{*} = \gamma_1' Fisitc_{it-1}^{-} + \gamma_2' Fisitc_{it-1}^{+} + \beta' Z_{it} + \alpha' time_t + a_i + u_{it} \qquad (3)$$

where the index i represents the respondent and index t represents time (t=1991,1992……2002). $Fisitx_t^*$ denotes the financial situation change expectations in wave t. Z_{it} is a k-dimensional vector of background variables reflecting, for example, gender, age, the logarithm of real household income, and dummy variables for marriage status, smoking, housing wealth, education level, labour market status, number of children, household size, and geographic location, etc. $Fisitc_{it-1}^{-}$ and $Fisitc_{it-1}^{+}$ represent the realized financial deterioration and improvement in wave t-1 respectively. It means that the prediction $Fisitx_{it}^{*}$ given in wave t depends on the realized financial change $Fisitc_{it-1}$ the respondent has experienced during the past twelve months. It may also reflect a psychological effect of past financial changes on future expectations. This effect should not be present if the assumptions of the rational expectation hypothesis are satisfied ($\gamma_1' = \gamma_2' = 0$). a_i is an individual effect which is assumed to be a random effect, and distributed with mean zero and variance σ_a^2. u_{it} is an error term and assumed to follow a distribution with a zero mean and variance σ^2. Year dummies $time_t$ are included to allow for macro-economic shocks, assumed to be common for all respondents, and not varying with Z_{it}, $Fisitc_{it-1}^{-}$ or $Fisitc_{it-1}^{+}$. For all the financial questions, larger values of $Fisitx_{it}^{*}$ reflect better states. In the preliminary analysis I investigate the effects of background (demographical) variables

and realized financial changes in previous time periods on respondents' expectations of financial change over time.

IV RESULTS AND ANALYSIS

This section tests the rationality of expectations and analyzes the properties of households' expectations errors and expectations. To start with, the demographical variables in my regression included race. But, after dropping observations with item non-response, most of answers to the race question were inapplicable. As a result, race was excluded from the demographical variables considered. As a result, the following analysis controls for the following individual and household characteristics: age, real household income, marital status, gender, smoking behaviour, housing wealth, educational attainment, employment status, number of children, household size, and geographical region.

Expectations Rationality Tests

We start by testing the unbiasedness of financial change expectations. To do this equation (1) was estimated for the whole sample and for various sub-samples based on both the unbalanced and balanced database. Because the results from both databases are similar, we report the one based on the unbalanced database. The resulting coefficients and standard deviations for the whole sample and different demographic groups are graphed in Figures in Appendix A. For discrete expectations errors the chi-squared tests implied that the year dummies were jointly significant, suggesting there is significant variation in respondents' financial expectations errors from year to year, except the model in the case of 'others' in the education sub-sample. Regression results controlling for time effects were, therefore, reported in all instances except the 'others' case. Financial change expectations errors are found to be consistently positive throughout the 12 years for the whole sample, suggesting that people were continuously and positively surprised over the period. In short, the respondents' financial expectations appear to be significantly biased. The coefficient of

cross-correlation ρ is strongly significant across samples, suggesting there is significant heterogeneity effect. That is, respondent expectations errors appear to be biased. But, it requires many years, even decades, to distinguish whether they are biased *ex ante*, or just *ex post*. The bias is problematic for empirical studies with short sample period in either case. In particular, individual expectations have higher-frequency systematic patterns in expectations errors.

Turning to the efficiency of financial change expectations, I used equation (2) to estimate the results based on the unbalanced sample. These are shown in Table 1 in Appendix B. The pseudo R^2s are small, implying that expectation errors are largely unsystematic. However, the demographic variables are jointly significant according to the chi-squared statistics, which is counter to the assumption of efficiency. The errors tended to be especially positive on average among those on high incomes, in paid employment, married couples, female-headed households and those with no children. They were also more positive among those living in East Anglia, Yorkshire or the North. However, the errors were more negative among older respondents, smokers, and those purchasing their house on a mortgage. While the overall average expectations error was negative in the preliminary analysis, the bias in financial status change expectation tended to increase with some demographic variable like age, number of children, and unemployment status.

In summary, while this analysis of the deviation between financial expectations and outcomes suggests that the assumption on rational expectations or absence of macro-economic shocks are invalid, whether this can be interpreted as evidence of "irrationality" is a subtle issue. Because we assume that time dummies capture all systematic components of forecast errors, the results can be interpreted by the *ex post* shocks. It could be that the young, those on low incomes, smokers, those paying a mortgage, the unemployed, and parents, have perfectly rational expectations *ex ante*, but *ex post* have received disproportionately more bad or good shocks over the sample period. This is consistent with the literature that finds evidence of increasing inequality

over the period, in part due to skill-biased technical change[9]. But the assumption in empirical studies that time dummies capture all systematic components of forecast errors makes the *ex post* interpretation of the results problematic. The inefficiency of financial expectations is hard to explain and more likely represents *ex ante* inefficiency.

Financial Expectations

This part presents the relationships between financial change expectations and the subsequent financial change outcomes. It uses a random effects ordered probit model to investigate the characteristics of subjective data by describing the relationship between an individual's financial expectation and explanatory variables including past realized financial changes and a set of demographical variables. To see whether different social groups have different financial change expectations, it also included various dummy variables. Furthermore, it explored various sub-samples based on gender, marital status, educational attainment and job status. Since much experimental evidence indicates that expectations depend heavily on the status quo, the current financial situation is excluded in the regressions, which instead use two dummy variables derived from past financial outcomes to understand their effects on respondents' expectation. The results are shown in Table 3 of Appendix B, which presents the effects of realized financial improvements or deteriorations on individual's financial change expectations. The total number of observations in the sample is 72921. No restrictions were imposed upon the slope coefficients across the various waves.

The relationship between financial change expectations and background variables is set out in Table 3 (Appendix B). The effect of *Deteriorated* (-0.21) is significantly negative and the effect of *Improved* (0.36) is significantly positive for the whole sample. It implies that those who experience financial change deterioration in the past have a higher probability of expecting further financial change deterioration than others. On the other hand, those who experience financial change improvements tend

[9] Cutler and Katz (1991); Attanasio and Davis (1996)

to have higher expectations for their financial change. In other words, it means that expected financial changes can be predicted with some certainty by previous financial change outcomes. However, because the magnitude of the effect of being better off is over two times greater than being worse off, there seems to be a persistent asymmetry in how individuals evaluate the effect of financial gains and losses on their future financial well-being. People are likely to have higher expectations when their situation improves, and refuse to expect worse outcome even when they had become worse off in the past. This result can be potentially helpful to explain loss aversion in economic behaviour if expectation affects consumers' choice.

The results from the sub-samples are also presented in Table 3 in Appendix B. It shows that men's expectations are more sensitive to both improvements (0.32 v 0.30) and deteriorations (-0.10 v -0.05) than those of women. It means the past experience impacts more on male respondents. In addition, the magnitude of the effect of realized improvements and deteriorations on the subject's expectation is not symmetric either. Similarly, the realized changes influence the expectations of the married and the highly-educated respondents more than those of the unmarried, and those with only a secondary education level, respectively. In other words, married people, or the highly educated, were more sensitive to realized financial changes. In addition, the realized improvement has a greater effect on expectations than realized deteriorations in both cases. It is noted that realized deteriorations do not influence the expectations of the respondents with secondary education level. In other words, there is no difference between realized deterioration and realized non-change when individuals with secondary education level form their expectations. The asymmetry of response is more evident when I consider the schooling effect.

Generally speaking, the family has been the traditional source of protection against the economic consequences of uncertain events. This is because the economics literature has demonstrated that marriage partners can be made strictly better-off, provided their incomes are not perfectly correlated. However the above analysis shows exactly the opposite: being married was associated with a lower expectations comparing to those

of the unmarried. The effect (-0.10) is statistically significant using a *t*-test. This result may be explained by the extent to which families depend on market conditions. In countries with developed welfare systems, providing good medical or unemployment insurance, one does not need to rely on one's spouse to enjoy increasing returns or to pool risks. Furthermore, establishing a new household involves considerable start-up costs (for the ceremony itself, the purchase or rental of a new house, furniture, household equipment, etc.), while the maintenance cost of a new household may in the early years be higher than those borne by the two families of origin. On the other hand, it could also explain why the unmarried decrease their expectations more as they age relative to the married. This should have been the case in UK. The gap in expectations between the married and the unmarried among the higher-educated group (-0.08) is less than among the secondary-educated group (-0.12). This means the secondary-educated are more sensitive to changes in their marital status, and lower their expectation more than the highly educated after they get married. Also, the gap in expectations between women and men among the married group is less than the gap among those in the unmarried group. The possible explanation is that marriage does make women feel a bit more dependant over their future.

Females tended to have lower expectations than males: the coefficient for women (-0.06) was negative and significant. This result is similar to that found by Barskey *et al.* (1997) and Donkers *et al.* (1999). At a deeper level, there may be biological reasons, with women's position in procreation relative to men's requiring them to be more risk averse. An explanation for why females are more prudent may be because they dispose of 'household income' rather than their 'own income'. We could use working female in future regressions instead simply their gender in further investigations. If the explanation of females being more risk averse is because they do not work, it would be expected that the coefficient of working female would be significantly different from the coefficient of simply being female. If this were not the case, it would suggest that female risk aversion is not related to having no income of their own. However, the results present that there is not significant difference between highly educated women

and highly educated men when they make their expectations.

Although the above results show higher education gives women more confidence in the process of forecasting their future, there is no significant difference between the highly educated and those with secondary education level in the samples.

Age is generally used as a proxy for unobserved social status, health and cohort effects. The analysis found that age had a small negative effect (-0.041) on financial change expectations. Individual expectations decrease as their age increases. There are a number of potential explanations for this: that the old are not happy the longer they live; the old feel less in control of their environment; or have lower aspirations, which are hence easier to meet (A. Cambell *et al.* 1976). The coefficients of age were significantly different between the married (-0.036) and the unmarried (-0.051). This suggests that although the married have lower expectations at a point in time relative to the unmarried, the unmarried were more likely to lower their expectations more quickly than the married with increasing age. Similarly, considering the schooling effect, highly educated people decreased their expectations with age more quickly than people of the secondary education level.

The results found significant negative effects for real household incomes (-0.03) on individual expectation, as might have been expected, in either the whole sample or some of the sub-samples. The negative coefficient means that, for such people, the higher their household income in the past 12 months, the worse the financial situation expected in the coming year. Furthermore, when a variable to capture income variance was included in the regressions, its coefficient was significantly positive in all cases, although very small. This result conflicts with the general idea that those with higher 'permanent' incomes are, on average, more likely to be optimistic than others.

There is a strong positive relationship between being a smoker and an individual's expectations. If smoking is viewed as a proxy for risk-aversion, smokers might be considered to be risk-lovers who have higher expectations. Another explanation is that

smoking alleviates the smokers' stress and this leads them to have higher expectations of the future than non-smokers. In the gender sub-sample, although the female have lower expectations in the whole sample, smoking behaviour pushes their expectations much more than the male. In other words, smoking behaviour can diminish the gap in expectation between the female and the male. Also, smoking leads a diminishing gap between the married and the unmarried. For highly educated smokers, they have lower expectations relative to those with secondary education level.

Housing wealth had a significant effect on individual's expectation or respondents owning their own home had significantly lower expectation than non-owner, while respondents with a mortgage had the highest expectations than all others in the whole sample. The possible explanation is that respondents with a mortgage are confident of their improved future financial well-being and consequently prefer take out mortgage to support their housing. However, the secondary educated with a rent have higher expectations relative to others.

Five types of labour supply status were considered in the analysis: paid employment, self-employment, unemployment, retired, and various forms of economic inactivity. The unemployed were the most optimistic in their expectations, while the retired had the lowest expectation. This conflicts with the view that the unemployed have to persistently lower their expectations because of the strong causal relationship between past and current unemployment shown by Arulampalam *et al.* (2000). One explanation for this is that it reflects their higher expected chances of finding a job due to an upswing of the business cycle. The unmarried and the secondary-educated exhibited a greater attachment to being unemployed than the married and the highly educated respectively, related who tended to be in employment.

There is considerable evidence of a strong negative correlation between household size and income per person in developing countries. As a result, it is often concluded that people living in larger and (generally) younger households are typically poorer. The poor also tend to devote a higher share of their budget to essential goods. But because

certain goods (water taps, cooking utensils, firewood, clothing and housing) allow for the possibility of sharing or bulk purchase, i.e. economies of scale, the cost per person of a given standard of living is lower when individuals live together than apart. In this analysis, individuals living in medium-sized households had higher expectations compared to those in smaller and larger households, while those in the smallest households had the lowest expectations. However it is interesting to note that the unmarried living in large households had lower expectations than others, while the married living in large households had the highest expectations in similar circumstances. One reason for this is that the unmarried focus on the household's costs, while the married focus on the emotional aspects of family life. Female respondents lower their expectations more than male if their household size changes from medium to small. Conversely, if their household size changes from medium to large, the female lower less, relative to the male. Considering the previous results, we found that the female usually have lower expectations, which indicates that the female also take into account the emotional aspects of family life, and large household size can increase their expectations. There did not appear to be significant difference in expectations by household size for respondents with only a secondary level education.

Similarly, this analysis found that respondents with two children were the most optimistic in the whole sample and sub-samples. One explanation for this is that the subsidy from government is the same or greater than the family costs for two children. In terms of marital status, the unmarried people with more than two children had the lowest expectations. It was not significantly different for their expectations if the number of children was not more than two. Interestingly, the birth of the first baby will lower the expectations of the secondary-educated, but after the first born, more children make their expectations recover, and then have no further positive influence thereafter. In all cases, parents with two children had the highest expectations.

Properties of Financial Expectations Errors

The previous part explained why different social groups have different financial

expectations, and showed who have higher or lower expectations. This part identifies who were rational, and who usually made mistakes in forecasting their future, by analysing the characteristics of financial expectation errors in more details. This is important to aid our understanding of the ability of respondents to foresee and adjust to impending financial status changes. We added financial change outcomes in the wave *t*-1 into equation (2) in line with the regression of financial expectations. Table 2 in Appendix B shows that most independent variables are significant at the 95% confidence level. The coefficients of financial change outcome come in with the expected sign in the samples. This suggests that financial outcomes have a strongly positive relationship with respondents' expectation errors. Individuals significantly overestimate their expectations when they realize that their financial position has worsened over the past 12 months, while those whose financial situation has improved have a larger probability of underestimating future increases than others. Relating to the coefficients of expectations in the previous section, we find that even the realized improvement increases respondents' expectations but the actual improvement is still underestimated. Similarly, the actual deterioration is greater than respondents expect when they have experienced deterioration. In short, the magnitude of improvement and deterioration are both underestimated. Further, the magnitude of this effect is also significantly asymmetric: the magnitude of the negative effect of *Deteriorated* (-0.21) is significantly less than that of the positive effect of *Improved* (0.31). The most plausible explanation of this is that those respondents whose financial situation have deteriorated are either too optimistic about the future, or are more likely to view these negative financial changes as temporary.

Furthermore, the demographic variables are also economically significant. For instance, the expectations errors are about 4.7 percentage point larger (more positive) for married respondents, relative to the unmarried. Similarly, the errors are about 9.4 percentage points larger for female, relative to male. As a result, married women (0.07) were more pessimistic than married men (0.05) in this analysis, because the magnitude of expectations, which men (-0.13) and women (-0.12), decrease, were nearly same

relative to the unmarried. In terms of education sub-samples, the married, or women with a secondary education level, appeared more pessimistic than unmarried, because they had lower expectations. The interesting point is that the highly educated married have lower expectations than the unmarried, but they do not appear more optimistic or pessimistic. Also, the highly educated women and men have the same expectations, but women were found to be more pessimistic than men. At the same time, there is no significant difference across education level in the whole sample.

The coefficient of age becomes insignificant in expectations errors regression, while it is significantly negative in expectations regression. It means that although respondents' expectations decrease with their age, the change in their age will not influence their ability to make expectations.

Smokers are more optimistic than non-smokers in all samples, and this result could be consistent with the view that smokers are considered as risk-lovers. Smokers with only secondary level education are more optimistic than those who were highly educated. Smoking behaviour can be considered as an important factor indicating individual's optimism.

Respondents who rent are more pessimistic relative to both those owning their own home, or non-owners, in the whole sample, although they have higher expectations than home owners. In other words, they usually receive more *ex post* good shocks, or have lower *ex ante* expectations relative to others. Further, the actual financial improvement of home owners is less than others; since home owners have the same expectations errors as respondents with a mortgage, while they have the lowest expectations. However, the secondary educated with a mortgage are more optimistic than those who rent, even though they have lower expectations than the latter. The unemployed have highest expectations, and are the most optimistic, while the in-paid-employment sample members were the most pessimistic. This result is consistent in all samples. As a result, unemployment can also be considered to be an important factor indicating over-optimism.

In relation to the number of children, one child is jointly significantly negative. This means that respondents with only one child are more optimistic than others, although respondents with two children have higher expectations. But women with two children appear more optimistic than other women, because they have obviously higher expectations. Another exception is the secondary-educated with two children, who are the most optimistic.

In the whole sample, there are no significant differences of forecast errors among respondents living in different-sized households, even people living in small households have lower expectations. In the female sub-sample, respondents in medium household size appeared more optimistic than those in other household size. Men, and the unmarried in big households, appear more pessimistic

The differences between regions are not significant in the whole sample, except that people living in East Anglia and Yorkshire are more pessimistic than those in other regions. Considering male sub-samples, there is no region appearing more pessimistic or optimistic than the others. But, for female, women living in Wales and Scotland are more optimistic than those living in other regions. Similarly, the unmarried living in the Southeast, and Yorkshire, are more optimistic.

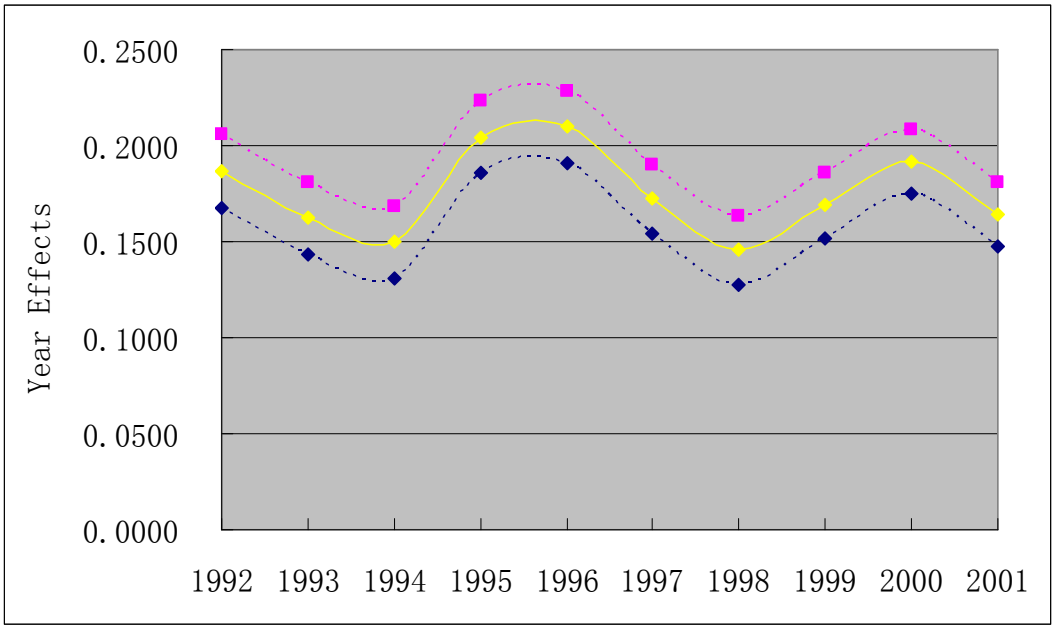
V CONCLUSION

This paper analyzed this direct subjective data on financial expectations and compared them to the outcomes using the BHPS covering the period 1991-2003. Its main findings are as follows. First, the number of people overestimating future financial changes is larger than the number of people underestimating them. This suggests that people's expectations are not rational, as agents whose financial situation has deteriorated are systematically too optimistic, or view negative financial changes as temporary. Second, those people whose financial situation has improved in the past tend to be more sensitive than those whose financial position change has deteriorated. This result, potentially, can explain the asymmetric nature of consumers' behaviour in

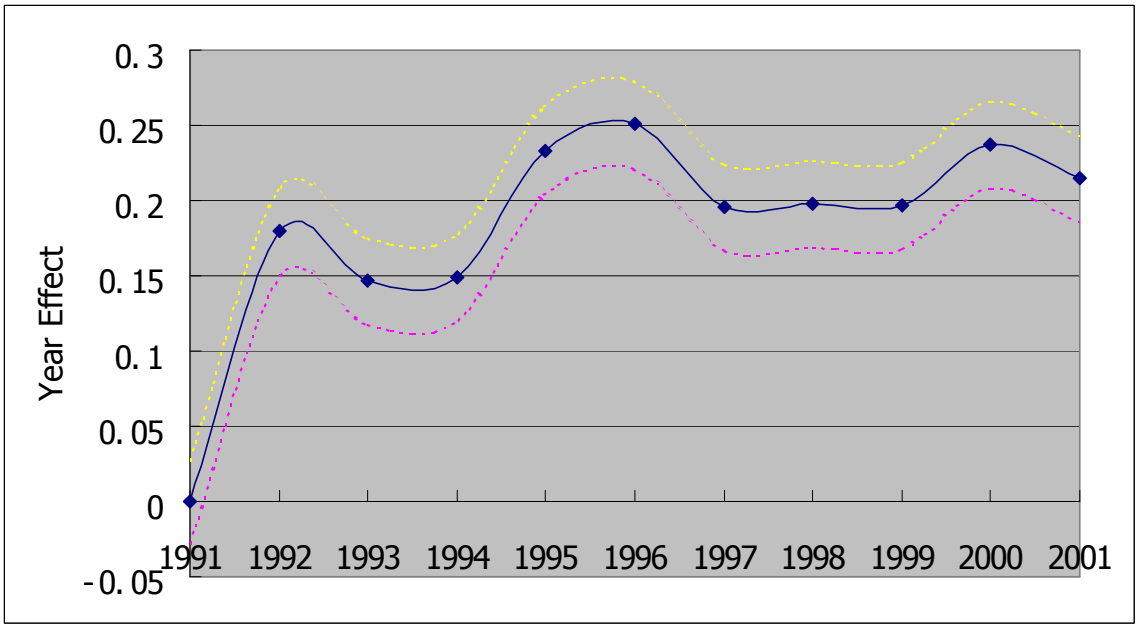
terms of loss aversion in the consumption literature. Thirdly, the expectations of men, the married, and those with only a secondary level education, are more sensitive to their financial outcomes than others. Fourth, with respect to expectations, there are no significant relationships between real household incomes and an individual's expectations. The married are more pessimistic than the unmarried, but marriage can alleviate people's pessimism over the time scale, or make women and smokers more optimistic. However women and the highly educated individuals generally have comparatively lower expectations, while individuals living in medium sized households, or those renting accommodation, with two children, or who are currently unemployed, have relatively higher expectations than the others. Fifth, comparing the expected and realized financial outcomes over the same time period suggests that the married, women, the paid employed, and people living in smaller households, are more pessimistic than others, whilst smokers and the unemployed are over-optimistic. In addition, individuals with only one child find it easier to be over-optimistic generally, but the results are different in the different sub-groups.

Appendix A – Time Effects in Forecast Errors

Whole Sample

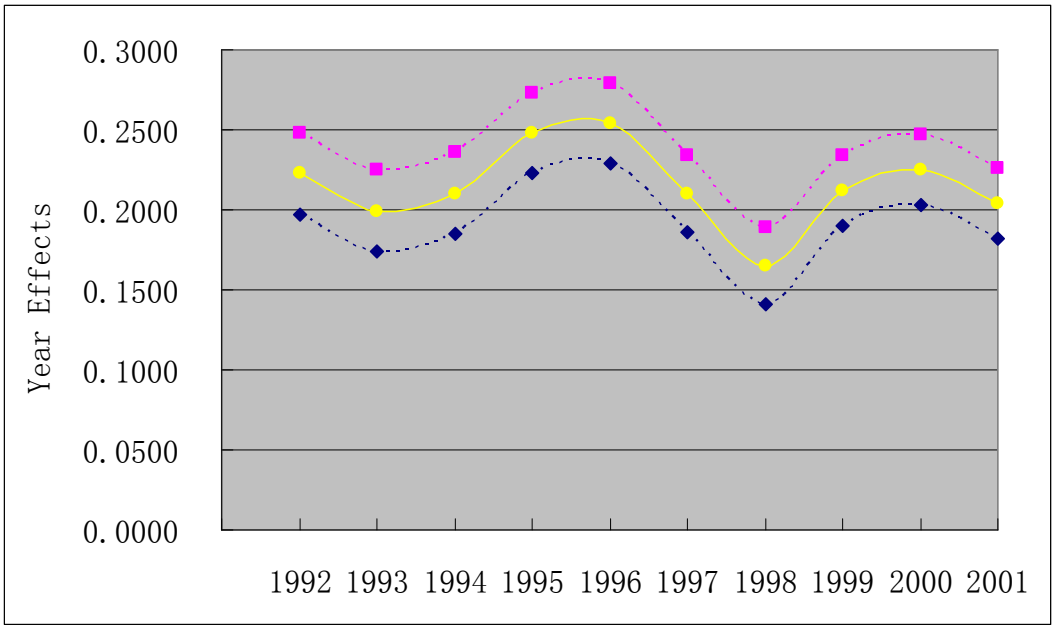


Unbalanced: #obs=94094, LR Chi2(10)=186.84, $\rho = 0.103$

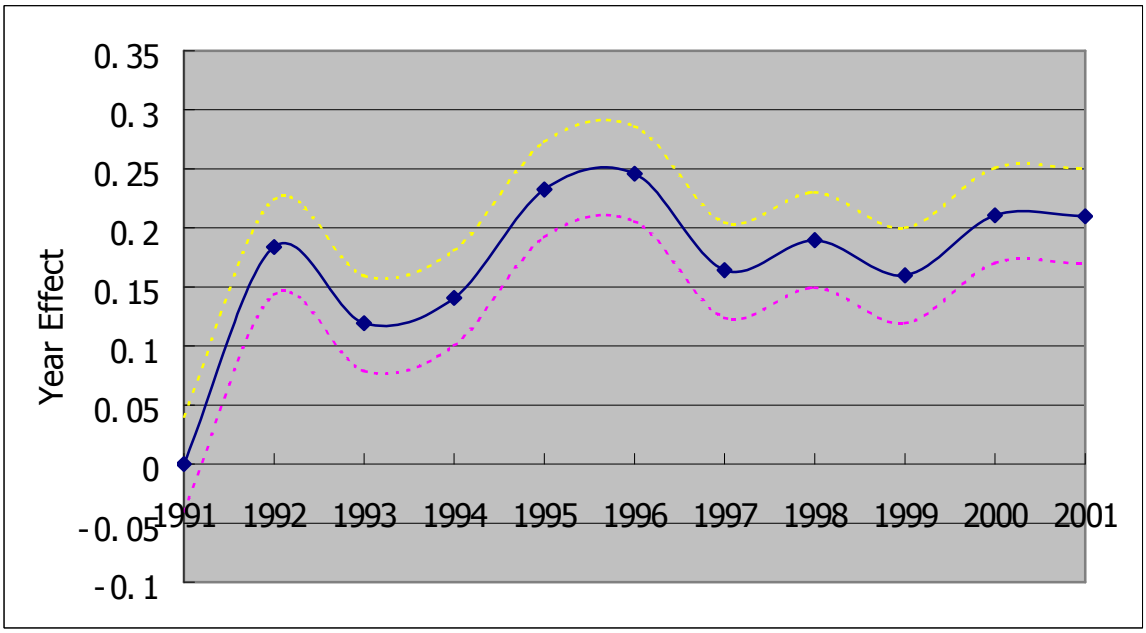


Balanced: #obs=31978, LR Chi2(10)=113.51

Male

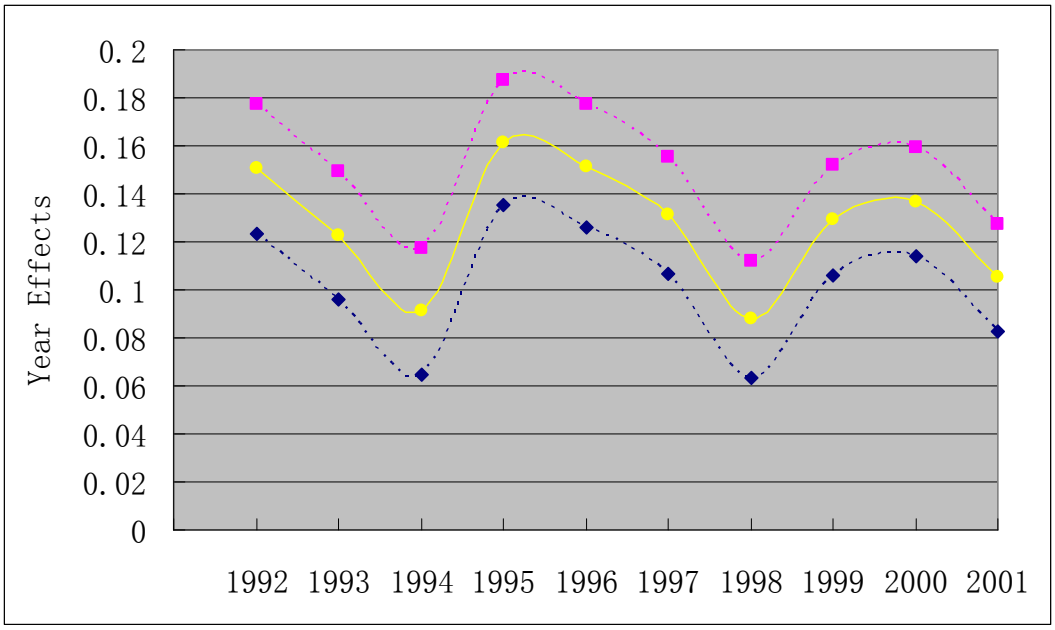


Unbalanced: #obs = 63031, LR Chi2(10) = 148.51, $\rho = 0.104$

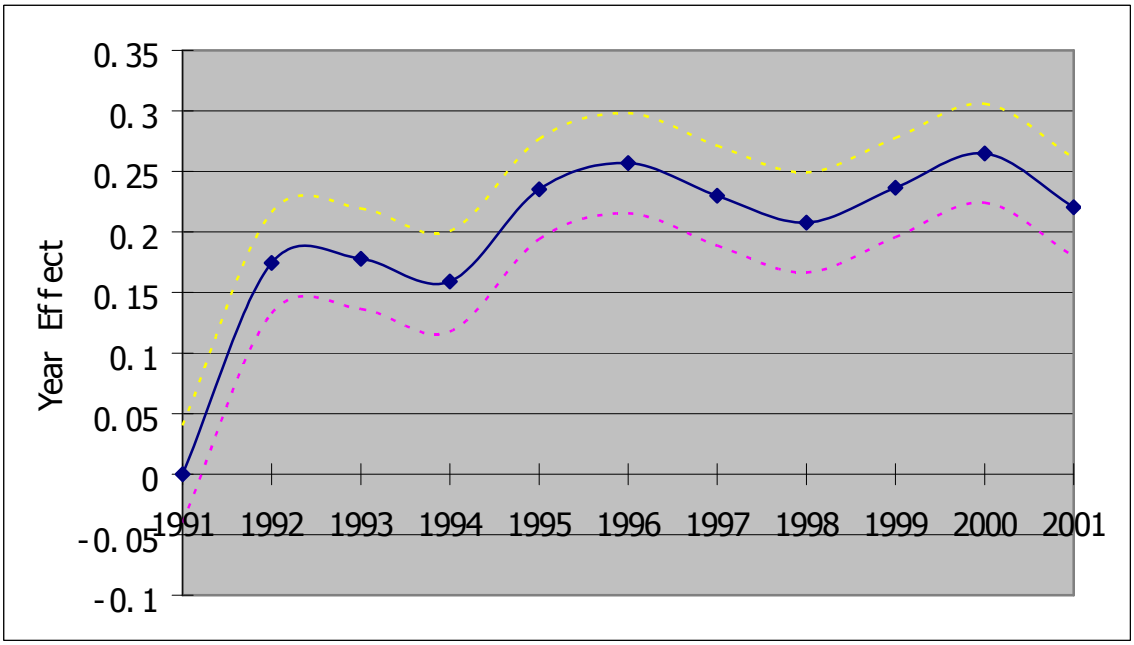


Balanced: #obs = 16126, LR Chi2(10) =56.26

Female

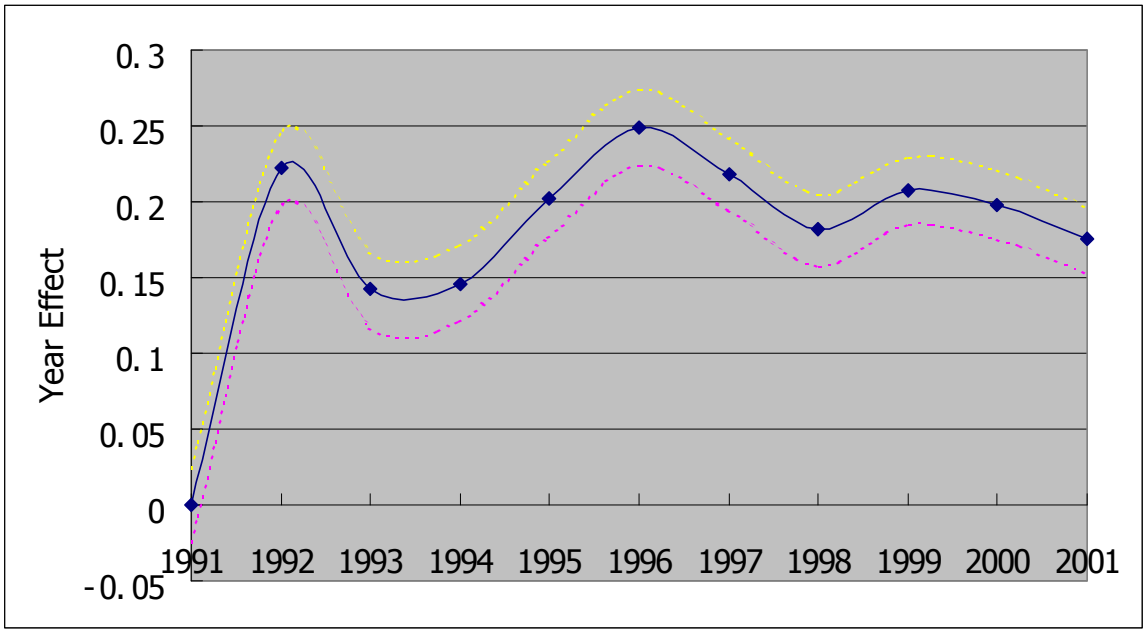


Unbalanced: #obs = 62003, LR Chi2(10) = 62.98， $\rho = 0.107$

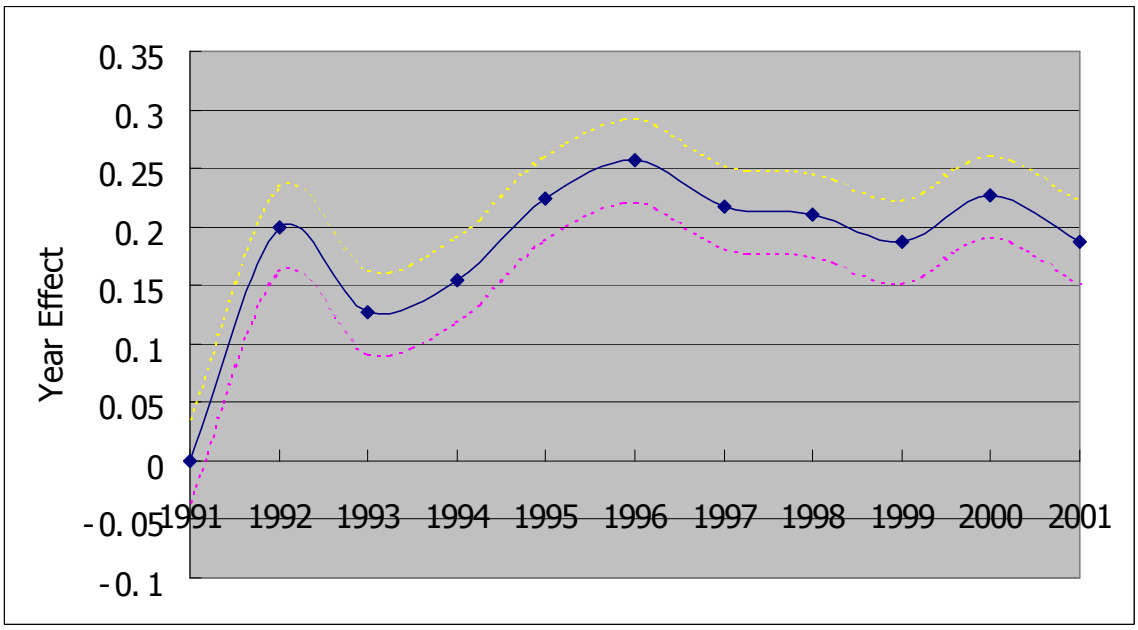


Balanced: #obs = 15852, LR Chi(10) = 62.75

Married

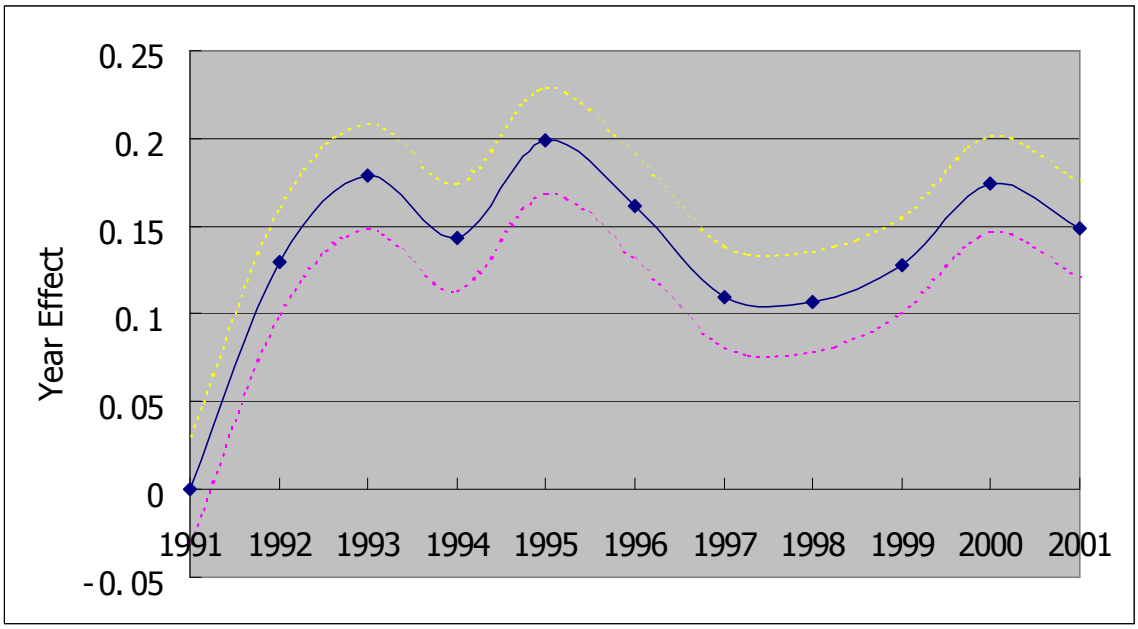


Unbalanced: #obs = 51054, LR Chi2(10) = 149.14

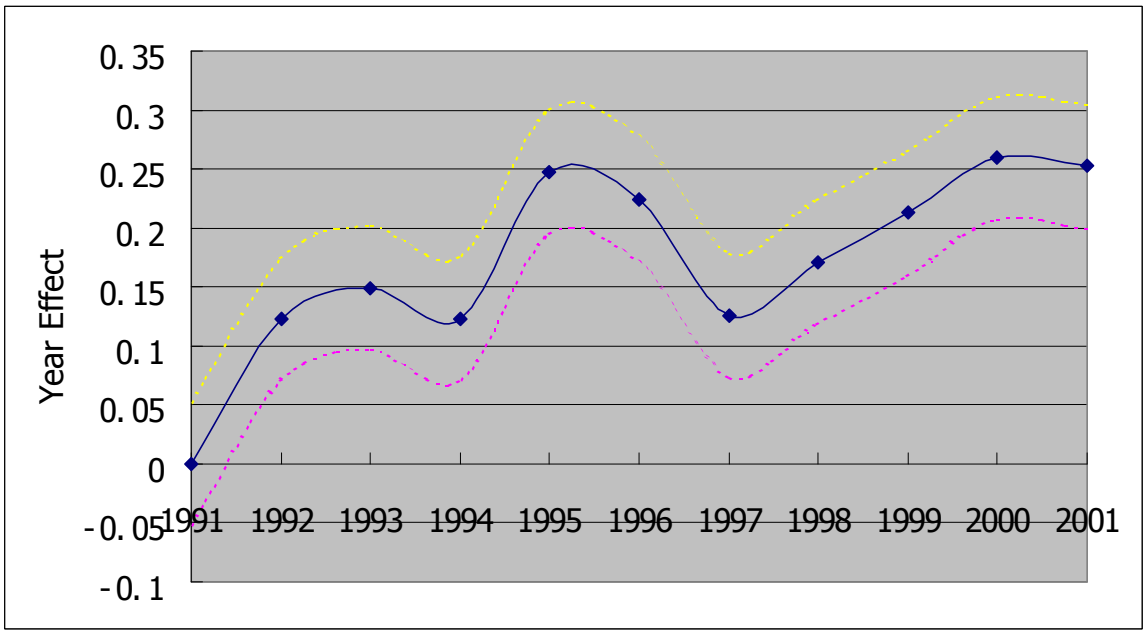


Balanced: #obs = 21299, LR Chi2(10) = 75.4

Unmarried

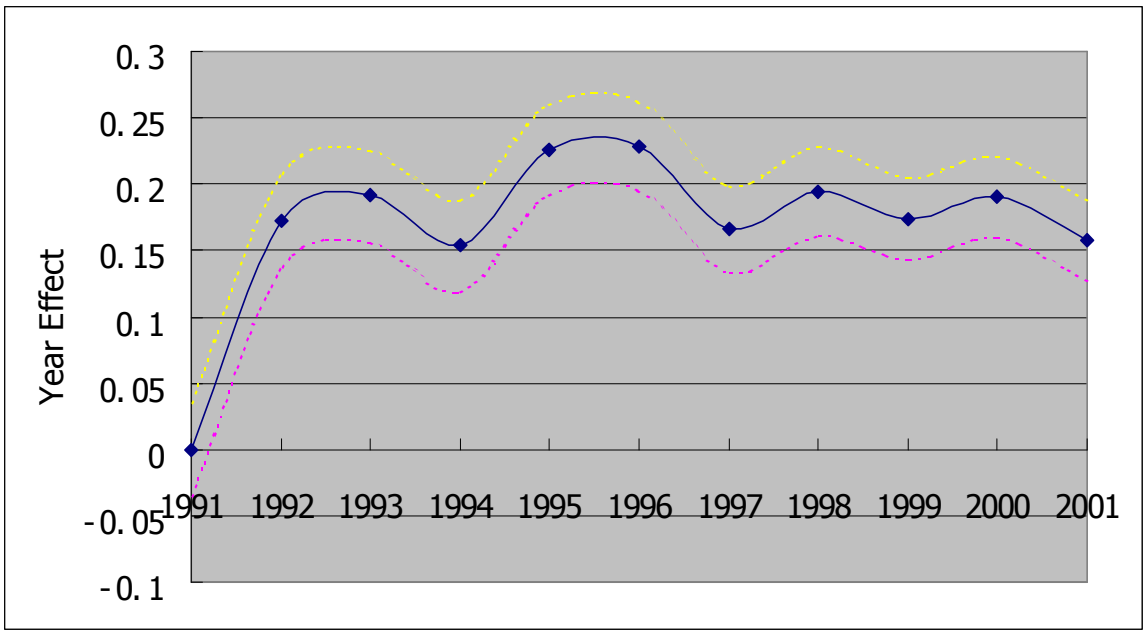


Unbalanced: #obs = 40211, LR Chi2(10) = 64.98

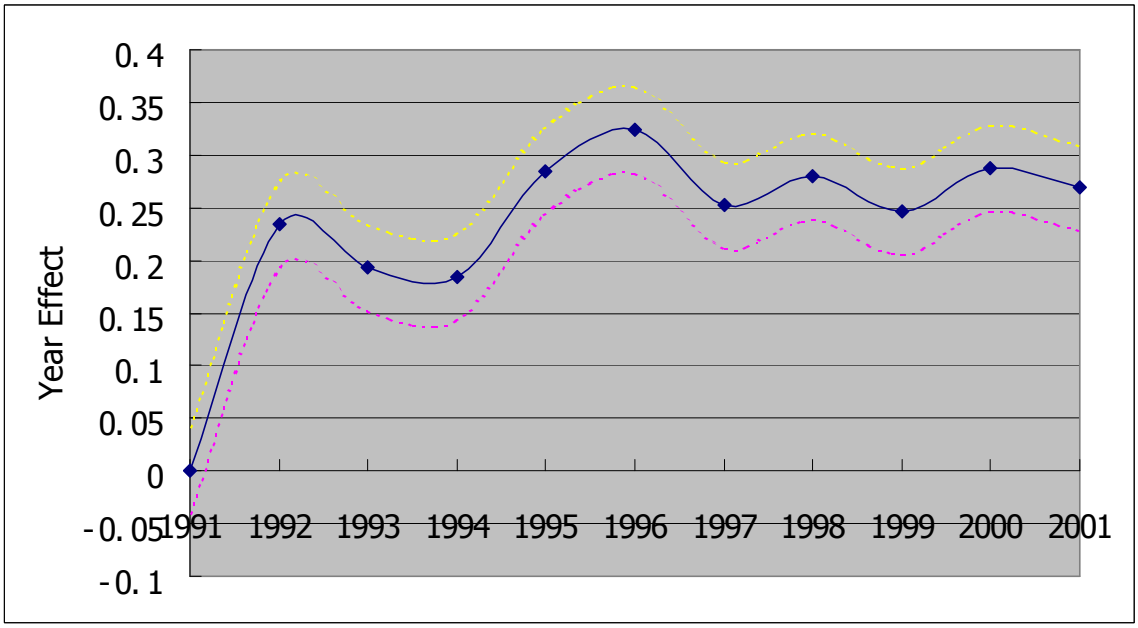


Balanced: #obs = 9756, LR Chi2(10) = 43.68

Secondary Education

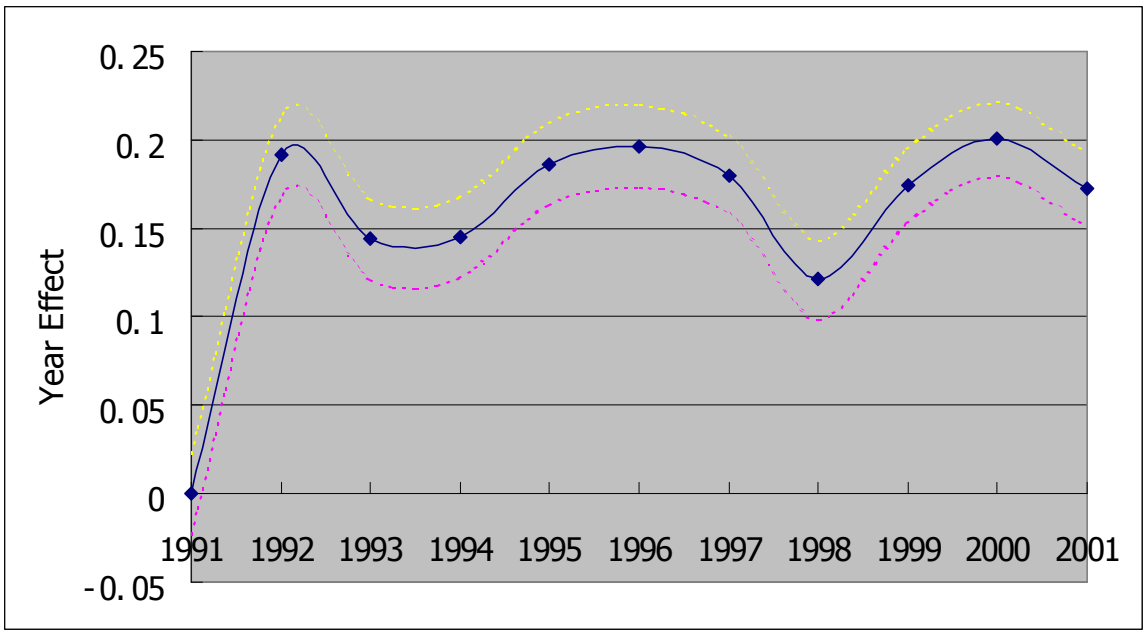


Unbalanced: #obs = 30961, LR Chi2(10) = 62.16

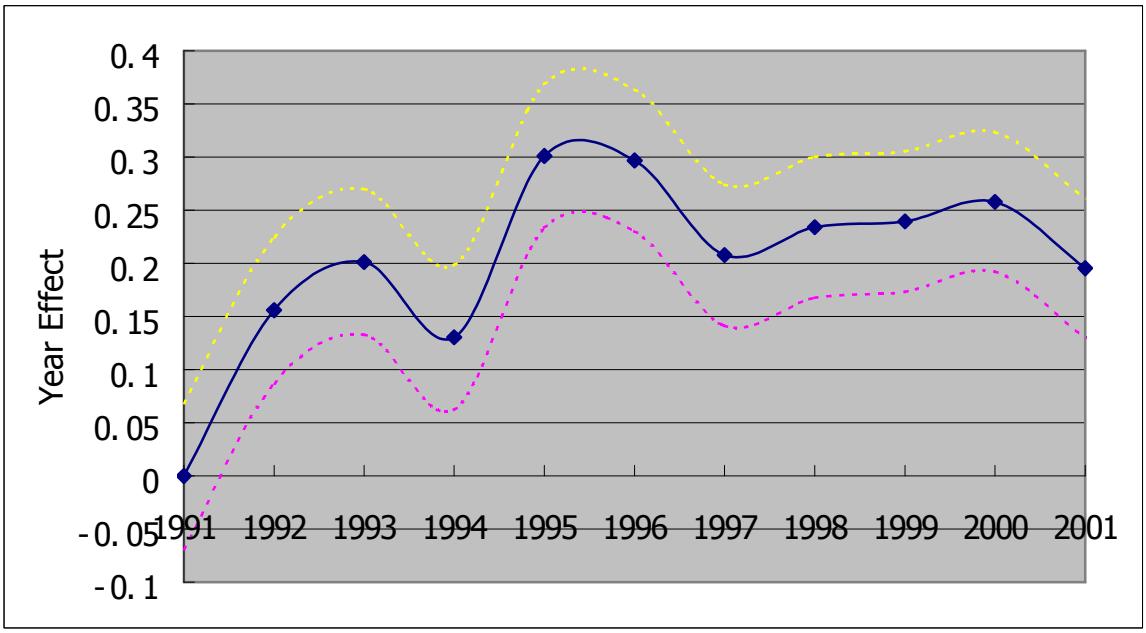


Balanced: #obs = 15498, LR Chi2(10) = 89.88

Higher Education



Unbalanced: #obs = 59845, LR Chi2(10) = 132.83



Balanced: #obs = 6265, LR Chi2(10) = 31.64

Appendix B

Table 1 Financial Expectations Errors Regression

Dependent Variable = Fisite (BHPS: 1991~2002)

	Whole Sample			*Male*			*Female*			*Married*			*Unmarried*		
Probit Model	*Mean*	*Coef*	*T-Stat.*	*Mean*	*Coef.*	*T-Stat.*	*Mean.*	*Coef.*	*T-Stat.*	*Mean.*	*Coef.*	*T-Stat.*	*Mean*	*Coef.*	*T-Stat.*
Age	44.88	-0.0088*	-5.080	44.88	-0.0201*	-12.290	43.81	-0.0219*	-13.970	48.89	-0.004	-1.400	40.25	-0.010*	-4.000
AgeAge/100	23.63	0.0125*	7.160	23.63	0.0224*	12.710	22.90	0.0241*	14.310	26.08	0.0076*	2.580	20.81	0.0135*	5.610
Log of Income	71.95	0.1388*	22.040	3.89	0.0761*	14.120	3.64	0.0738*	13.860	4.05	0.1342*	16.330	3.59	0.1741*	15.780
Income Varance	-	0.0000*	-2.500	-	0.0000*	-2.450	-	0.0000	-0.710	-	0.0000	-1.920	-	0.0000	-0.930
No married	0.46	-	-	0.46	-	-	0.52	-	-	--	-	-	--	-	-
Married	0.54	0.0838*	6.330	0.54	0.0703*	5.340	0.48	0.1159*	9.040	--	--	--	--	--	--
Male	0.50	-	-	0.50	-	-	-	-	-	0.53	-	-	0.47	-	-
Female	0.50	0.1180*	12.460	0.50	-	-	-	-	-	0.47	0.1539*	11.860	0.53	0.0524*	3.390
No Smoker	0.71	-	-	0.71	-	-	0.70	-	-	0.75	-	-	0.66	-	-
Smokers	0.29	-0.0886*	-8.540	0.29	-0.1060*	-10.490	0.30	-0.1005*	-9.760	0.25	-0.0805*	-5.840	0.34	-0.0887*	-5.380
Housing Owned	0.24	-	-	0.24	-	-	0.23	-	-	0.26	-	-	0.21	-	-
Housing Mortgage	0.48	-0.0385*	-3.070	0.48	-0.0039	-0.310	0.47	-0.0001	0.000	0.55	-0.0406*	-2.490	0.40	-0.0321	-1.530
Housing Rented	0.28	-0.0164	-1.220	0.28	-0.0759*	-5.540	0.30	-0.0702*	-5.200	0.18	-0.0119	-0.620	0.39	-0.0089	-0.450
Secondary Education	0.02	0.0527	1.740	0.02	0.1058*	3.640	0.02	0.0308	0.940	0.02	0.0447	1.160	0.02	0.0810	1.560
Higher Education	0.33	-	-	0.33	-	-	0.32	-	-	0.48	-	-	0.48	-	-
Others	0.65	-0.0155	-1.510	0.65	0.0054	0.550	0.67	-0.0019	-0.180	0.67	-0.0313*	-2.390	0.63	0.0184	1.060
In Paid employed	0.54	-	-	0.54	-	-	0.54	-	-	0.59	-	-	0.49	-	-

Self employment	0.08	-0.1150*	-6.950	0.08	-0.0862*	-5.330	0.05	-0.0950*	-4.610	0.10	-0.1220*	-6.160	0.05	-0.0803*	-2.490
Unemployed	0.05	-0.3710*	-14.320	0.05	-0.3815*	-16.860	0.04	-0.3961*	-15.400	0.03	-0.2630*	-6.750	0.07	-0.4388*	-12.020
Retired	0.21	-0.0611*	-3.200	0.21	-0.0558*	-2.670	0.21	-0.0478*	-2.320	0.22	-0.0734*	-3.100	0.21	-0.0002	-0.010
Others	0.13	-0.0224	-1.140	0.13	0.1669*	10.050	0.15	0.1430*	8.700	0.07	-0.0822*	-3.060	0.19	0.0759*	2.520
No Child	0.74	-	-	0.74	-	-	0.75	-	-	0.62	-	-	0.88	-	-
1 Child	0.11	-0.0818*	-5.560	0.11	-0.0894*	-6.000	0.11	-0.0707*	-4.810	0.15	-0.0778*	-4.240	0.07	-0.0761*	-2.480
2 Children	0.11	-0.0738*	-4.790	0.11	-0.0973*	-6.150	0.10	-0.0897*	-5.490	0.16	-0.0848*	-4.560	0.04	-0.0681	-1.750
3+ Children	0.04	-0.0858*	-3.730	0.04	-0.0913*	-4.020	0.04	-0.1113*	-4.410	0.07	-0.1079*	-4.180	0.01	-0.0126	-0.160
Small HH Size	0.17	-0.0259	-1.630	0.17	0.0198	1.220	0.18	0.0212	1.360	0.01	0.0317	0.370	0.36	-0.0209	-1.120
Medium HH Size	0.53	-	-	0.53	-	-	0.51	-	-	0.73	-	-	0.30	-	-
Big HH Size	0.30	-0.0042	-0.380	0.30	0.0393*	3.620	0.31	0.0289*	2.580	0.26	-0.0460*	-3.320	0.34	0.0712*	3.180
London	0.08	0.0103	0.590	0.08	-0.0346	-1.790	0.07	-0.0196	-1.000	0.07	0.0035	0.150	0.09	0.0294	1.060
Southeast	0.20	-	-	0.20	-	-	0.21	-	-	0.16	-	-	0.15	-	-
Southwest	0.07	0.0104	0.600	0.07	0.0119	0.630	0.06	-0.0247	-1.250	0.08	-0.0224	-1.020	0.07	0.0762*	2.570
East Anglia	0.03	0.0607*	2.620	0.03	0.0385	1.490	0.03	0.0407	1.500	0.04	0.0673*	2.360	0.03	0.0840*	2.020
Midlands	0.14	0.0272	1.870	0.14	-0.0089	-0.580	0.13	-0.0208	-1.320	0.14	0.0153	0.840	0.14	0.0592*	2.360
Yorkshires	0.08	0.0462*	2.690	0.08	0.0145	0.760	0.07	0.0010	0.050	0.08	0.0618*	2.860	0.07	0.0352	1.180
Wales	0.11	0.0162	0.760	0.11	-0.0197	-1.210	0.13	-0.0620*	-3.790	0.11	-0.0259	-0.940	0.11	0.0936*	2.700
Scotland	0.14	0.0266	1.490	0.14	0.0072	0.470	0.17	-0.0404*	-2.700	0.14	0.0066	0.290	0.15	0.0711*	2.430
Greater Manchester	0.03	0.0352	1.460	0.03	-0.0287	-1.080	0.03	-0.0211	-0.810	0.03	0.0144	0.460	0.04	0.1055*	2.730
North	0.11	0.0349*	2.240	0.11	-0.0010	-0.060	0.09	0.0037	0.220	0.11	0.0126	0.640	0.10	0.0851*	3.190
LR chi2(39)=		1837.3		*LR chi2(38)=*	1616.93			1383.88			938.23			928.08	
Pseudo R2		0.012		*Pseudo R2*	0.0105			0.0093			0.0101			0.0168	

Dependent Variable = Fisite (BHPS: 1991~2002)

	Secondary Edu.			*High Education*			*Others*					
Probit Model	*Mean*	*Coef*	*T-Stat.*	*Mean*	*Coef.*	*T-Stat.*	*Mean.*	*Coef.*	*T-Stat.*	.	.	.
Age	38.04	-0.0087*	-2.480	48.17	-0.0053*	-2.500	42.32	0.0124	0.750	--	--	--
AgeAge/100	16.75	0.0098*	2.520	26.99	0.0107*	5.190	19.71	-0.0209	-1.240	--	--	--
Log of Income	4.12	0.1794*	16.690	3.67	0.1092*	13.250	4.68	0.2369*	5.440	--	--	--
Income Variance	-	0.0000*	-3.140	-	0.0000*	-2.630	-	0.0000	1.680	--	--	--
No married	0.49	-	-	0.45	-	-	0.40	-	-	--	--	--
Married	0.51	0.1171*	5.130	0.55	0.0560*	3.340	0.60	0.0754	0.820	--	--	--
Male	0.57	-	-	0.48	-	-	0.61	-	-	--	--	--
Female	0.43	0.1417*	8.680	0.52	0.1010*	8.380	0.39	-0.0099	-0.150	--	--	--
No Smoker	0.76	-	-	0.68	-	-	0.87	-	-	--	--	--
Smokers	0.24	-0.1006*	-5.130	0.32	-0.0839*	-6.750	0.13	0.0222	0.200	--	--	--
Housing Owned	0.19	-	-	0.27			0.19	-	-	--	--	--
Housing Mortgage	0.60	-0.0828*	-3.500	0.42	-0.0249	-1.620	0.66	-0.2905*	-2.910	--	--	--
Housing Rented	0.21	-0.0941*	-3.150	0.32	0.0012	0.080	0.14	-0.3575*	-2.700	--	--	--
Secondary Education	--	--	--	--	--	--	--	--	--	--	--	--
Higher Education	--	--	--	--	--	--	--	--	--	--	--	--
Others	--	--	--	--	--	--	--	--	--	--	--	--
In Paid employed	0.66	-	-	0.48	-	-	0.75	-	-	--	--	--
Self employment	0.09	-0.0897*	-3.350	0.07	-0.1034*	-4.760	0.09	-0.2659*	-2.350	--	--	--
Unemployed	0.03	-0.4689*	-9.400	0.05	-0.3443*	-11.060	0.03	-0.0553	-0.220	--	--	--
Retired	0.09	-0.0697	-1.710	0.27	-0.0873*	-3.950	0.08	0.1927	1.090	--	--	--
Others	0.13	0.0426	1.170	0.13	-0.0781*	-3.250	0.05	0.3375*	2.120	--	--	--
No Child	0.71	-	-	0.76	-	-	0.67	-	-	--	--	--
1 Child	0.13	-0.0816*	-3.390	0.10	-0.0716*	-3.690	0.15	-0.2766*	-3.060	--	--	--
2 Children	0.12	-0.1205*	-4.880	0.10	-0.0349	-1.680	0.13	-0.1266	-1.300	--	--	--
3+ Children	0.04	-0.1192*	-2.950	0.04	-0.0460	-1.580	0.04	-0.3319*	-2.090	--	--	--
Small HH Size	0.14	-0.0159	-0.580	0.18	-0.0369	-1.840	0.17	-0.0658	-0.620	--	--	--
Medium HH Size	0.56	-	-	0.51	-	-	0.65	-	-	--	--	--
Big HH Size	0.30	0.0079	0.400	0.30	-0.0103	-0.740	0.18	0.0677	0.770	--	--	--
London	0.09	0.0279	0.960	0.07	0.0056	0.240	0.16	-0.0800	-0.810	--	--	--
Southeast	0.21	-	-	0.20	-	-	0.24	-	-	--	--	--
Southwest	0.06	0.0449	1.390	0.08	0.0053	0.250	0.05	-0.0717	-0.570	--	--	--
East Anglia	0.03	0.0725	1.750	0.03	0.0584*	2.070	0.02	0.1468	0.410	--	--	--
Midlands	0.13	0.0340	1.310	0.15	0.0205	1.130	0.12	-0.0104	-0.100	--	--	--
Yorkshires	0.07	0.0811*	2.600	0.08	0.0335	1.580	0.07	-0.1483	-1.340	--	--	--
Wales	0.10	0.0424	1.180	0.11	0.0128	0.480	0.06	-0.3350	-1.370	--	--	--
Scotland	0.18	0.0154	0.540	0.12	0.0265	1.120	0.21	-0.0367	-0.340	--	--	--
Greater Manchester	0.03	0.0400	0.980	0.03	0.0291	0.960	0.02	0.5027*	1.990	--	--	--
North	0.09	0.0085	0.310	0.11	0.0497*	2.580	0.06	-0.1636	-1.290	--	--	--
LR chi2(37)=		813			1022.31			115.38				
Pseudo R2		0.0158			0.0106			0.0334				
Number of Obs.		19229			39903			1281				

1) *UK CPI for obtaining real income figures in 1991; 2) * = significant at 5%; 3) Year dummies are jointly estimated; 4) Null hypothesis: coefficient corresponding to explanatory variable is equal to zero.*

Table 2 Financial Expectations Errors Regression

Dependent Variable = Fisite (BHPS: 1991~2002)

	Whole Sample			*Male*			*Female*			*Married*			*Unmarried*		
Probit Model	*Mean*	*Coef*	*T-Stat.*	*Mean*	*Coef.*	*T-Stat.*	*Mean.*	*Coef.*	*T-Stat.*	*Mean.*	*Coef.*	*T-Stat.*	*Mean*	*Coef.*	*T-Stat.*
Difficult	0.09	-0.2094*	-11.350	0.09	-0.2180*	-12.070	0.09	-0.2656*	-14.430	0.07	-0.200*	-7.690	0.24	-0.234*	-8.530
Getting_by	0.27	-	-	0.27	-	-	0.27	-	-	0.26	-	-	0.43	-	-
Comfortable	0.64	0.3091*	29.310	0.64	0.3251*	30.890	0.64	0.3187*	29.800	0.68	0.322*	23.370	0.33	0.279*	16.160
Age	44.88	-0.0032	-1.820	44.88	-0.0141*	-8.530	43.81	-0.0153*	-9.690	40.25	-0.002	-0.710	40.25	-0.002	-1.020
AgeAge/100	23.63	0.0075*	4.260	23.63	0.0169*	9.540	22.90	0.0178*	10.510	20.81	0.0063*	2.130	20.81	0.0067*	2.750
Log of Income	71.95	0.1064*	16.700	3.89	0.0529*	9.740	3.64	0.0555*	10.370	3.59	0.1000*	12.020	3.59	0.1357*	12.120
Income Variance	-	0.0000*	-3.570	-	0.0000*	-3.770	-	0.0000	-1.670	-	0.0000*	-2.560	-	0.0000	-1.740
No married	0.46	-	-	0.46	-	-	0.52	-	-	--	-	-	--	-	-
Married	0.54	0.0472*	3.550	0.54	0.0533*	4.030	0.48	0.0773*	6.000	--	--	--	--	--	--
Male	0.50	-	-	-	-	-	-	-	-	0.47	-	-	0.47	-	-
Female	0.50	0.0947*	9.950	-	-	-	-	-	-	0.53	0.1132*	8.660	0.53	0.0573*	3.700
No Smoker	0.71	-	-	0.71	-	-	0.70	-	-	0.66	-	-	0.66	-	-
Smokers	0.29	-0.0555*	-5.320	0.29	-0.0649*	-6.380	0.30	-0.0608*	-5.870	0.34	-0.0494*	-3.560	0.34	-0.0538*	-3.240
Housing Owned	0.24	-	-	0.24	-	-	0.23	-	-	0.21	-	-	0.21	-	-
Housing Mortgage	0.48	-0.0081	-0.640	0.48	0.0204	1.580	0.47	0.0256*	1.960	0.40	-0.0024	-0.140	0.40	-0.0086	-0.410
Housing Rented	0.28	0.0475*	3.500	0.28	-0.0074	-0.530	0.30	0.0055	0.400	0.39	0.0659*	3.410	0.39	0.0392*	1.960
Secondary Education	0.02	0.0495	1.640	0.02	0.0871*	2.990	0.02	0.0156	0.480	0.02	0.0330	0.860	0.02	0.0883	1.700
Higher Education	0.33	-	-	0.33	-	-	0.32	-	-	0.48	-	-	0.48	-	-

Others	0.65	-0.0024	-0.240	0.65	0.0148	1.510	0.67	0.0093	0.890	0.63	-0.0190	-1.450	0.63	0.0294	1.680
In Paid employed	0.54	-	-	0.54	-	-	0.54	-	-	0.49	-	-	0.49	-	-
Self employment	0.08	-0.1140*	-6.880	0.08	-0.0830*	-5.120	0.05	-0.0841*	-4.070	0.05	-0.1215*	-6.130	0.05	-0.0807*	-2.500
Unemployed	0.05	-0.2574*	-9.810	0.05	-0.2529*	-11.000	0.04	-0.2699*	-10.370	0.07	-0.1625*	-4.140	0.07	-0.3249*	-8.760
Retired	0.21	-0.0511*	-2.670	0.21	-0.0434*	-2.070	0.21	-0.0302	-1.470	0.21	-0.0710*	-2.990	0.21	0.0094	0.270
Others	0.13	0.0529*	2.680	0.13	0.2244*	13.430	0.15	0.1992*	12.040	0.19	-0.0033	-0.120	0.19	0.1415*	4.650
No Child	0.74	-	-	0.74	-	-	0.75	-	-	0.88	-	-	0.88	-	-
1 Child	0.11	-0.0472*	-3.190	0.11	-0.0561*	-3.750	0.11	-0.0415*	-2.810	0.07	-0.0499*	-2.710	0.07	-0.0349	-1.130
2 Children	0.11	-0.0286	-1.850	0.11	-0.0535*	-3.370	0.10	-0.0501*	-3.060	0.04	-0.0419*	-2.240	0.04	-0.0250	-0.640
3+ Children	0.04	-0.0209	-0.900	0.04	-0.0309	-1.360	0.04	-0.0526*	-2.080	0.01	-0.0489	-1.880	0.01	0.0840	1.060
Small HH Size	0.17	-0.0165	-1.030	0.17	0.0283	1.750	0.18	0.0399*	2.560	0.36	0.0922	1.060	0.36	-0.0110	-0.590
Medium HH Size	0.53	-	-	0.53	-	-	0.51	-	-	0.30	-	-	0.30	-	-
Big HH Size	0.30	0.0061	0.550	0.30	0.0498*	4.580	0.31	0.0407*	3.630	0.34	-0.0293*	-2.110	0.34	0.0790*	3.520
London	0.08	0.0136	0.770	0.08	-0.0260	-1.340	0.07	-0.0188	-0.960	0.09	0.0136	0.580	0.09	0.0284	1.030
Southeast	0.20	-	-	0.20	-	-	0.21	-	-	0.15	-	-	0.15	-	-
Southwest	0.07	0.0212	1.210	0.07	0.0321	1.690	0.06	-0.0138	-0.700	0.07	-0.0104	-0.470	0.07	0.0859*	2.890
East Anglia	0.03	0.0613*	2.650	0.03	0.0444	1.710	0.03	0.0445	1.640	0.03	0.0622*	2.180	0.03	0.0884*	2.120
Midlands	0.14	0.0174	1.200	0.14	-0.0147	-0.960	0.13	-0.0241	-1.520	0.14	0.0041	0.220	0.14	0.0506*	2.020
Yorkshires	0.08	0.0361*	2.100	0.08	0.0099	0.520	0.07	-0.0107	-0.560	0.07	0.0477*	2.200	0.07	0.0311	1.040
Wales	0.11	0.0288	1.360	0.11	-0.0071	-0.430	0.13	-0.0382*	-2.320	0.11	-0.0213	-0.770	0.11	0.1104*	3.180
Scotland	0.14	0.0179	1.000	0.14	0.0040	0.260	0.17	-0.0396*	-2.630	0.15	-0.0093	-0.400	0.15	0.0704*	2.400
Greater Manchester	0.03	0.0268	1.110	0.03	-0.0339	-1.270	0.03	-0.0231	-0.880	0.04	0.0075	0.240	0.04	0.0967*	2.500
North	0.11	0.0195	1.250	0.11	-0.0050	-0.300	0.09	-0.0010	-0.060	0.10	-0.0074	-0.370	0.10	0.0750*	2.800
LR chi2(41)=		3196.46	LR chi2(40)=		3154.17			2989.96			1739.64			1415.57	
Pseudo R2		0.0209			0.0205			0.0201			0.0188			0.0256	
Number of Obs.		60626			60062			58736			37130			21790	

Dependent Variable = Fisite (BHPS: 1991~2002)

	Secondary Edu.			*High Education*			*Others*			*Consistency*		
Probit Model	*Mean*	*Coef*	*T-Stat.*	*Mean*	*Coef.*	*T-Stat.*	*Mean.*	*Coef.*	*T-Stat.*		*Coef.*	*T-Stat.*
Difficult	*0.08*	*-0.2779**	*-7.82*	*0.10*	*-0.1741**	*-7.91*	*0.09*	*-0.2086**	*-11.32*	*Fisite_1*	*-0.06*	*-10.3500*
Getting_by	0.22			0.30	-	-	0.27	-	-			
Comfortable	0.71	0.3687*	18.14	0.60	0.2844*	22.64	0.64	0.3106*	29.55	--		
Age	38.04	-0.0036	-1.010	48.17	0.0002	0.090	44.88	-0.0032	-1.850	--	--	--
AgeAge/100	16.75	0.0056	1.440	26.99	0.0056*	2.710	23.63	0.0075*	4.300	--	--	--
Log of Income	4.12	0.1432*	13.160	3.67	0.0784*	9.410	3.84	0.1073*	17.040	--	--	--
Income Variance	-	0.0000*	-3.870	-	0.0000*	-3.470	-	0.0000*	-3.420	--	--	--
No married	0.49	-	-	0.45	-	-	0.46	-	-	--	--	--
Married	0.51	0.0733*	3.200	0.55	0.0233	1.380	0.54	0.0464*	3.500	--	--	--
Male	0.57	-	-	0.48	-	-	0.50	-	-	--	--	--
Female	0.43	0.1163*	7.080	0.52	0.0771*	6.370	0.50	0.0944*	9.950	--	--	--
No Smoker	0.76	-	-	0.68	-	-	0.71	-	-	--	--	--
Smokers	0.24	-0.0658*	-3.340	0.32	-0.0536*	-4.290	0.29	-0.0570*	-5.500	--	--	--
Housing Owned	0.19	-	-	0.27			0.24	-	-	--	--	--
Housing Mortgage	0.60	-0.0557*	-2.350	0.42	0.0048	0.310	0.48	-0.0076	-0.600	--	--	--
Housing Rented	0.21	-0.0172	-0.570	0.32	0.0573*	3.680	0.28	0.0485*	3.600	--	--	--
Secondary Education	--	--	--	--	--	--	--	--	--	--	--	--
Higher Education	--	--	--	--	--	--	--	--	--	--	--	--
Others	--	--	--	--	--	--	--	--	--	--	--	--
In Paid employed	0.66	-	-	0.48	-	-	0.54	-	-	--	--	--
Self employment	0.09	-0.0833*	-3.110	0.07	-0.1071*	-4.920	0.08	-0.1141*	-6.890	--	--	--
Unemployed	0.03	-0.3289*	-6.520	0.05	-0.2445*	-7.750	0.05	-0.2576*	-9.830	--	--	--
Retired	0.09	-0.1016*	-2.480	0.27	-0.0685*	-3.090	0.21	-0.0518*	-2.710	--	--	--

Others	0.13	0.1338*	3.630	0.13	-0.0059	-0.240	0.13	0.0515*	2.620	--	--	--
No Child	0.71	-	-	0.76	-	-	0.74	-	-	--	--	--
1 Child	0.13	-0.0307	-1.270	0.10	-0.0446*	-2.290	0.11	-0.0475*	-3.220	--	--	--
2 Children	0.12	-0.0587*	-2.360	0.10	0.0034	0.160	0.11	-0.0288	-1.870	--	--	--
3+ Children	0.04	-0.0306	-0.750	0.04	0.0114	0.390	0.04	-0.0190	-0.820	--	--	--
Small HH Size	0.14	-0.0089	-0.320	0.18	-0.0261	-1.300	0.17	-0.0166	-1.050	--	--	--
Medium HH Size	0.56	-	-	0.51	-	-	0.53	-	-	--	--	--
Big HH Size	0.30	0.0236	1.200	0.30	-0.0009	-0.060	0.30	0.0067	0.610	--	--	--
London	0.09	0.0431	1.470	0.07	0.0028	0.120	0.08	0.0143	0.820	--	--	--
Southeast	0.21	-	-	0.20	-	-	0.20	-	-	--	--	--
Southwest	0.06	0.0435	1.340	0.08	0.0191	0.900	0.07	0.0231	1.330	--	--	--
East Anglia	0.03	0.0848*	2.040	0.03	0.0555*	1.960	0.03	0.0612*	2.640	--	--	--
Midlands	0.13	0.0199	0.770	0.15	0.0114	0.630	0.14	0.0180	1.240	--	--	--
Yorkshires	0.07	0.0889*	2.840	0.08	0.0178	0.840	0.08	0.0367*	2.130	--	--	--
Wales	0.10	0.0486	1.350	0.11	0.0266	1.000	0.11	0.0291	1.370	--	--	--
Scotland	0.18	0.0092	0.320	0.12	0.0139	0.590	0.14	0.0185	1.040	--	--	--
Greater Manchester	0.03	0.0186	0.460	0.03	0.0265	0.880	0.03	0.0253	1.050	--	--	--
North	0.09	-0.0002	-0.010	0.11	0.0319	1.650	0.11	0.0210	1.350	--	--	--
LR chi2(39)=		1391.93			1785.25			3211.8				
Pseudo R2		0.0271			0.0185			0.021	LR chi2(1)=		107.06	
Number of Obs.		19223			39888			60818			70418	

1) UK CPI for obtaining real income figures in 1991.

*2) * = significant at 5%.*

3) Year dummies are jointly estimated.

4) *Null hypothesis: coefficient corresponding to explanatory variable is equal to zero.*

Table 3 Financial Expectations Regression

Dependent Variable = Fisitx (BHPS: 1991~2002)

	Whole Sample			*Male*			*Female*			*Married*			*Unmarried*		
Probit Model	*Mean*	*Coef*	*T-Stat.*	*Mean*	*Coef.*	*T-Stat.*	*Mean.*	*Coef.*	*T-Stat.*	*Mean.*	*Coef.*	*T-Stat.*	*Mean*	*Coef.*	*T-Stat.*
Decr_1	0.24	-0.2089*	-19.460	0.23	-0.0950*	-8.910	0.23	-0.0485*	-4.520	0.24	-0.2426*	-17.960	0.24	-0.1496*	-8.410
Same	0.47	-	-	0.46	-	-	0.48	-	-	0.51	-	-	0.43	-	-
Incr_1	0.29	0.3612*	32.410	0.31	0.3234*	31.380	0.30	0.3024*	29.210	0.25	0.4062*	28.710	0.33	0.2936*	16.150
Age	44.88	-0.0413*	-24.390	44.88	-0.0324*	-20.830	43.81	-0.0347*	-23.590	40.25	-0.0365*	-12.890	40.25	-0.0509*	-21.890
AgeAge/100	23.63	0.0250*	14.580	23.63	0.0177*	10.550	22.90	0.0214*	13.640	20.81	0.0189*	6.670	20.81	0.0355*	15.230
Household Income	71.95	-0.0311*	-5.250	3.89	0.0043	0.910	3.64	0.0044	0.940	3.59	-0.0410*	-5.350	3.59	-0.0113	-1.110
Income Variance.	-	0.0000*	8.600	-	0.0000*	8.350	-	0.0000*	3.920	-	0.0000*	6.850	-	0.0000*	5.160
No married	0.46	-	-	0.46	-	-	0.52	-	-	--	--	--	--	--	--
Married	0.54	-0.0963*	-7.290	0.54	-0.1294*	-10.360	0.48	-0.1169*	-9.680	--	--	--	--	--	--
Male	0.50	-	-	--	--	--	--	--	--	0.47	-	-	0.47	-	-
Female	0.50	-0.0593*	-6.250	--	--	--	--	--	--	0.53	-0.0623*	-4.840	0.53	-0.0748*	-4.940
No Smoker	0.71	-	-	0.71	-	-	0.70	-	-	0.66	-	-	0.66	-	-
Smokers	0.29	0.0753*	7.330	0.29	0.0872*	9.180	0.30	0.0910*	9.520	0.34	0.0769*	5.720	0.34	0.0708*	4.410
Housing Owned	0.24	-	-	0.24			0.23	-	-	0.21	-	-	0.21	-	-
Housing Mortgage	0.48	0.0817*	6.520	0.48	0.0632*	5.160	0.47	0.0697*	5.690	0.40	0.0643*	3.960	0.40	0.0836*	4.070
Housing Rented	0.28	0.0461*	3.460	0.28	0.0752*	5.840	0.30	0.0840*	6.690	0.39	0.0030	0.160	0.39	0.0763*	3.930
Secondary Education	0.02	-0.0133	-0.430	0.02	0.0202	0.720	0.02	0.0607	1.930	0.02	-0.0051	-0.130	0.02	-0.0257	-0.490
Higher Education	0.33	-	-	0.33	-	-	0.32	-	-	0.48	-	-	0.48	-	-
Others	0.65	-0.0120	-1.160	0.65	-0.0110	-1.180	0.67	0.0199*	2.040	0.63	0.0024	0.190	0.63	-0.0350*	-2.050
In Paid employed	0.54	-	-	0.54	-	-	0.54	-	-	0.49	-	-	0.49	-	-

Self employment	0.08	0.2080*	12.440	0.08	0.1702*	10.800	0.05	0.1593*	8.150	0.05	0.1888*	9.570	0.05	0.2591*	8.100
Unemployed	0.05	0.3618*	14.630	0.05	0.3436*	16.640	0.04	0.3853*	16.920	0.07	0.2106*	5.830	0.07	0.4838*	13.940
Retired	0.21	-0.0919*	-4.850	0.21	-0.1168*	-5.850	0.21	-0.1716*	-8.970	0.21	-0.0455	-1.930	0.21	-0.1551*	-4.680
Others	0.13	-0.2015*	-11.170	0.13	-0.4362*	-28.820	0.15	-0.3945*	-27.350	0.19	-0.1064*	-4.390	0.19	-0.2973*	-10.780
No Child	0.74	-	-	0.74	-	-	0.75	-	-	0.88	-	-	0.88	-	-
1 Child	0.11	-0.0007	-0.050	0.11	-0.0231	-1.620	0.11	-0.0073	-0.520	0.07	-0.0029	-0.160	0.07	-0.0106	-0.360
2 Children	0.11	0.0652*	4.270	0.11	0.0412*	2.710	0.10	0.0875*	5.710	0.04	0.0792*	4.400	0.04	0.0242	0.670
3+ Children	0.04	0.0092	0.410	0.04	-0.0129	-0.600	0.04	0.0192	0.840	0.01	0.0482	1.930	0.01	-0.1841*	-2.820
Small HH Size	0.17	-0.0379*	-2.390	0.17	-0.1013*	-6.570	0.18	-0.1243*	-8.470	0.36	-0.0098	-0.130	0.36	-0.0806*	-4.430
Medium HH Size	0.53	-	-	0.53	-	-	0.51	-	-	0.30	-	-	0.30	-	-
Big HH Size	0.30	-0.0096	-0.870	0.30	-0.0427*	-4.170	0.31	-0.0302*	-2.900	0.34	0.0331*	2.410	0.34	-0.1132*	-5.190
London	0.08	-0.0306	-1.760	0.08	0.0174	0.940	0.07	0.0104	0.560	0.09	-0.0600*	-2.610	0.09	-0.0107	-0.400
Southeast	0.20	-	-	0.20	-	-	0.21	-	-	0.15	-	-	0.15	-	-
Southwest	0.07	-0.0277	-1.590	0.07	-0.0432*	-2.390	0.06	0.0069	0.370	0.07	-0.0084	-0.390	0.07	-0.0653*	-2.260
East Anglia	0.03	-0.0829*	-3.560	0.03	-0.0650*	-2.570	0.03	-0.0469	-1.810	0.03	-0.0691*	-2.440	0.03	-0.1150*	-2.810
Midlands	0.14	-0.0120	-0.820	0.14	0.0312*	2.130	0.13	0.0272	1.850	0.14	-0.0096	-0.530	0.14	-0.0183	-0.750
Yorkshires	0.08	-0.0481*	-2.800	0.08	-0.0408*	-2.230	0.07	-0.0206	-1.130	0.07	-0.0430*	-2.010	0.07	-0.0644*	-2.230
Wales	0.11	-0.0766*	-3.640	0.11	-0.0063	-0.420	0.13	0.0089	0.600	0.11	-0.0190	-0.700	0.11	-0.1659*	-4.930
Scotland	0.14	0.0084	0.470	0.14	0.0459*	3.290	0.17	0.0643*	4.680	0.15	0.0358	1.570	0.15	-0.0308	-1.080
Greater Manchester	0.03	-0.0302	-1.250	0.03	0.0298	1.150	0.03	0.0085	0.340	0.04	-0.0248	-0.790	0.04	-0.0437	-1.150
North	0.11	-0.0320*	-2.050	0.11	-0.0236	-1.470	0.09	-0.0269	-1.660	0.10	-0.0167	-0.850	0.10	-0.0644*	-2.470
LR chi2(42)=		11468.7	*LR chi2(41)=*		12491.13			11977.78			5958.89			5402.25	
Pseudo R2		0.0854			0.0835			0.0814			0.0724			0.1048	
Number of Obs.		72921			79895			80674			45383			27558	

Dependent Variable = Fisitx (BHPS: 1991~2002)

	Secondary Edu.			*High Education*			*Others*		
Probit Model	*Mean*	*Coef*	*T-Stat.*	*Mean*	*Coef.*	*T-Stat.*	*Mean.*	*Coef.*	*T-Stat.*
Decr_1	0.25	-0.010	-0.510	0.24	-0.3159*	-24.150	0.20	0.15	1.82
Same	0.39	-	-	0.52	-	-	0.40	-	-
Incr_1	0.36	0.337*	18.230	0.25	0.4001*	27.810	0.40	0.3502*	4.920
Age	38.04	-0.0257*	-7.380	48.17	-0.0492*	-23.850	44.88	-0.0330*	-2.030
AgeAge/100	16.75	0.0103*	2.690	26.99	0.0315*	15.630	23.63	0.0236	1.400
Household Income	4.12	-0.0693*	-6.850	3.67	-0.0024	-0.310	3.84	-0.1048*	-2.690
Income Variance.	-	0.0000*	6.240	-	0.0000*	7.520	-	0.0000	-0.400
No married	0.49	-	-	0.45	-	-	0.46	-	-
Married	0.51	-0.1168*	-5.100	0.55	-0.0761*	-4.570	0.54	-0.1113	-1.210
Male	0.57	-	-	0.48	-	-	0.50	-	-
Female	0.43	-0.1296*	-7.960	0.52	-0.0099	-0.820	0.50	-0.1164	-1.740
No Smoker	0.76	-	-	0.68	-	-	0.71	-	-
Smokers	0.24	0.0870*	4.450	0.32	0.0711*	5.790	0.29	0.1760	1.590
Housing Owned	0.19	-	-	0.27	-	-	0.24	-	-
Housing Mortgage	0.60	0.1015*	4.290	0.42	0.0790*	5.150	0.48	0.3513*	3.480
Housing Rented	0.21	0.1630*	5.520	0.32	0.0167	1.090	0.28	0.4007*	3.060
Secondary Education	--	--	--	--	--	--	--	--	--
Higher Education	--	--	--	--	--	--	--	--	--
Others	--	--	--	--	--	--	--	--	--
In Paid employed	0.66	-	-	0.48	-	-	0.54	-	-
Self employment	0.09	0.1688*	6.250	0.07	0.2123*	9.680	0.08	0.2609*	2.290
Unemployed	0.03	0.5330*	10.760	0.05	0.3313*	11.320	0.05	0.8091*	3.240
Retired	0.09	0.0365	0.890	0.27	-0.0964*	-4.380	0.21	-0.1529	-0.860
Others	0.13	-0.3466*	-10.080	0.13	-0.1376*	-6.320	0.13	-0.0857	-0.550
No Child	0.71	-	-	0.76	-	-	0.74	-	-
1 Child	0.13	-0.0588*	-2.430	0.10	0.0298	1.560	0.11	-0.0973	-1.100
2 Children	0.12	0.0377	1.530	0.10	0.0761*	3.730	0.11	-0.0362	-0.360
3+ Children	0.04	0.0256	0.650	0.04	-0.0231	-0.820	0.04	0.2822	1.830
Small HH Size	0.14	-0.0501	-1.800	0.18	-0.0393*	-1.970	0.17	0.0234	0.220
Medium HH Size	0.56	-	-	0.51	-	-	0.53	-	-
Big HH Size	0.30	-0.0302	-1.540	0.30	0.0020	0.150	0.30	-0.1798*	-2.080
London	0.09	-0.0371	-1.270	0.07	-0.0235	-1.040	0.08	-0.1470	-1.500
Southeast	0.21	-	-	0.20	-	-	0.20	-	-
Southwest	0.06	-0.0671*	-2.080	0.08	-0.0131	-0.620	0.07	0.2388	1.870
East Anglia	0.03	-0.1227*	-2.950	0.03	-0.0510	-1.790	0.03	0.0727	0.230
Midlands	0.13	-0.0178	-0.690	0.15	0.0061	0.340	0.14	-0.1250	-1.200
Yorkshires	0.07	-0.0971*	-3.110	0.08	-0.0099	-0.470	0.08	-0.1389	-1.260
Wales	0.10	-0.0812*	-2.250	0.11	-0.0747*	-2.840	0.11	0.0881	0.340

Scotland	0.18	0.0016	0.060	0.12	0.0387	1.650	0.14	-0.1085	-1.020
Greater Manchester	0.03	-0.0827*	-2.020	0.03	0.0128	0.430	0.03	-0.1327	-0.530
North	0.09	-0.0328	-1.160	0.11	-0.0235	-1.220	0.11	-0.0545	-0.430
LR chi2(40)=		2700.84			8606.52			219.6	
Pseudo R2		0.062			0.099			0.075	
Number of Obs.		22719			8606.52			1522	

1) UK CPI for obtaining real income figures in 1991.

*2) * = significant at 5%.*

3) Year dummies are jointly estimated.

4) *Null hypothesis: coefficient corresponding to explanatory variable is equal to zero.*

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