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Is Perceived Financial Inadequacy Persistent?

Orkun Kaya

For additional information please contact:

Name: Orkun Kaya
Affiliation: Goethe University, Germany

Email Address: Orcun.Kaya@hof.uni-frankfurt.de

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Orcun Kaya*

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Abstract

In an attempt to understand the determinants of financial inadequacy, this paper employs the ability of households to make ends meet as a measure of their perceived financial inadequacy. Using household-level data from the European Community Household Panel (ECHP) that covers eight countries for the period from 1994 to 2001, a dynamic probit model incorporating both state dependency and individual fixed effects is applied. Exploiting a latterly enhanced bias corrected fixed effects probit model, I address the persistent nature of subjective financial inadequacy by directly estimating fixed effects whilst correcting for incidental parameters and avoiding the initial conditions problem of dynamic models. The results reveal that employing time invariant individual effects to model subjective monetary perception is essential. Yet controlling for household heterogeneity, income, indebtedness and health status, I document that in addition to the major differences across European households, country specific factors can have adverse effects on the persistent nature of perceived financial inadequacy.

Keywords: Financial well-being, Dynamic probit model with fixed effects, Bias corrections

*Orcun Kaya is with Goethe University Frankfurt, Department of Money and Macroeconomics, House of Finance, Grueneburgplatz 1, 60323, Frankfurt, Germany,E-mail: orkaya@wiwi.uni-frankfurt.de, Phone: +49 (0) 69 798 33827. The usual disclaimer applies.

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1 Introduction

About the time we think we can make ends meet, somebody moves the ends

President Herbert Clark Hoover

Financial inadequacy is an ambiguous concept without a straightforward definition. Some researchers define it as a monetary rationale where others consider it as a subjective perception. Apart from the absence of a globally accepted way of measurement, the definition of the conceptualization of financial inadequacy varies among different countries.

Defining the main causes of financial inconveniences or financial distress is essential to societies desiring to differentiate between financially adequate and inadequate households. The European Commission's EuroBarometer (2010) survey demonstrates that more Europeans are struggling to make ends meet because of the financial crisis and the fragile economies of European countries. One in every six Europeans reports that their household has had no money to pay ordinary bills, buy food or other daily consumer items, on at least one occasion in the past year and 20% had difficulties in keeping up with household bills and credit commitments at the time of the survey's fieldwork. Furthermore these financial problems are mostly not one-time experiences and the periods of these financial difficulties become even more relevant when they are persistent over time.

The purpose of this paper, therefore, is to present the findings of an exploratory study that was designed to review the determinants of financial inadequacy by focusing mainly on the persistent structure of this concept. To do so I exploit the recently enhanced nonlinear panel data model by Fernandez-Val (2009) which enables state dependency to be embedded in a panel probit model while controlling for time invariant unobserved heterogeneity (fixed effects). Employing this model I avoid two main problems related to the estimation of a dynamic probit model with time invariant household

heterogeneity. First the incidental parameters problem is reduced to a negligible degree by computing bias corrected estimates. Second the initial conditions problem is solved by not imposing restrictions on the initial values of the process. Moreover controlling for time-invariant unobserved heterogeneity I am now able to distinguish between true (the impact of the lagged dependent variable on the dependent variable) and spurious state dependency.

An alternative to traditional minimum income levels in defining financial inadequacy, is to exploit subjective responses to perceived income surveys which are capable of controlling for both the income and spending sides of household financial characteristics through time. For this purpose a household's ability to make ends meet, accountable on an ordinal scale in surveys, can be employed as a measure of perceived income inadequacy. The ability to make ends meet addresses the capability of households to survive financially, and is related to many household finance characteristics such as the ability to keep up with financial commitments, the attitude to savings, the possibility of running out of money before the next pay day, and households' previous financial difficulties. Given these reasonings an ordinal scale ability to make ends meet responses at household level is employed in this paper as a proxy of perceived financial inadequacy. The ability to make ends meet allows us to capture a great deal of time variation on the dependent variable which is especially vital for modeling individual time invariant effects as well.

The first contribution of this paper is to model perceived financial inadequacy in a dynamic manner controlling for fixed effects. In my model particular emphasis is placed on the extent to which state dependency of making ends meet responses, has an influence on the present period's ability to make ends meet over and above the role of factors that the existing literature has already identified. The dynamic nature of my modeling scheme also sheds light on the inertia of perceptions related to the adjustment rate of financial well-being (Pudney (2008), Pudney (2011)).

In studies that use the ability to make ends meet to analyze financial well-being, it is generally assumed that individuals constitute a pooled group. However, as shown by Ferrer-i-Carbonell and Frijters (2004), the influence of unobservable effects that are individual specific and constant over time should be taken into account if subjective survey questions are employed. The second contribution of this paper is to disentangle the uncertainty of the influence of unobservable individual specific time constant variables to a subjective rationale not directly related to well being studies.

Aggregating data across different counties can be misleading given that household characteristics in different countries may differ in a way that it could be difficult to capture by solely using country fixed effects. Moreover different institutions and regulations in different countries may impact distinctively the distribution of financially inadequate households over time. The final contribution of this paper is to address this issue and analyze a dynamic model of ability to make ends meet across eight different European countries separately.

This paper is structured as follows. Section 2 of the paper examines the existing literature on perceived financial inadequacy measures and its predictors. Section 3 presents the definition of the dependent variable, estimation methodology and details of the econometric model. Section 4 presents the general features of the data set and household demographics. The influence of lagged dependent variable and socio-economic factors are presented in section 5. Section 6 documents various sensitivity analysis of my model. Section 7 concludes the paper.

2 Background

The traditional way of interpreting financial difficulties is to determine specific income levels (usually called poverty lines) i.e. households having incomes below specific poverty lines are defined as poor or financially inadequate. However financial inadequacy is a sophisticated concept that can not solely be explained in terms of specific

income levels. There is a growing tendency among analysts to move beyond standard poverty statistics and develop alternative measures as subjective indicators that also take into account household consumption and overall economic well-being (Sen (1999)).

The use of subjective indicators as proxy measures of the individual utility in analyzing individual preferences, welfare, and poverty is now prevalent in economic literature (i.e. Ng (1997), Frey and Stutzer (2000), Tella et al. (2001), Praag et al. (2003), Ferrer-i-Carbonell and Van Praag (2003)). In this context a straightforward implementation for analyzing household perceptions of financial difficulties is to ask respondents about their ability to make ends meet. Danziger (1984) and De Vos and Garner (1991) address this type of methodology which employs the subjective minimum monthly income needed to make ends meet in order to shed light on the perception of financial difficulties. A more recent alternative methodology by Litwin and Sapir (2009) is to apply ordinal ability to make ends meet responses directly as the variable of interest.

Although there has been a variety of work on the subjective indicators as well as the econometric methodologies used in this area, much of the literature on subjective well being exploits static models. Owing to the difficulty of modeling subjective well-being in a dynamic manner controlling for individual specific effects, the dynamic nature of subjective perceptions or the type of dynamic analysis most appropriate for the evolution of attitudes and perceptions over time received little attention.

Van de Stadt et al. (1984) relate the utility of individuals with preference interdependence and construct a dynamic model to explain the variation of preferences assuming the variability of opinions. Pointing out both inertia and overreaction Pudney (2008) addresses the dynamic nature of financial well-being using a simulated maximum likelihood method. Subsequently Newman et al. (2008) concentrated on a dynamic ordered probit model where the reference group income effect as well as the dynamics of financial satisfaction is incorporated. In a more recent work Pudney (2011) showed that perceptions of current financial well-being take time to adjust fully to changed circumstances and perceptions of past well-being are positively contaminated by cur-

rent circumstances. Using German Socio-Economic Panel Study D'Ambrosio and Frick (2007) analyzed satisfaction from life and income depending on absolute and relative levels of income in a dynamic framework. All in all recent work on subjective financial well-being points out the importance of changes in individuals' perceptions of financial well-being in response to changing circumstances.

In addition to the dynamic nature, other causes of financial inadequacy can be grouped into two categories: the factors that can be controlled by the households and the ones that happen outside the control of households. For example poor budgeting or money mismanagement (Berthoud and Kempson (1992), Elliott (2005)) or unwillingness to pay debts (Dominy and Kempson (2003)) can be seen as behavioral causes which are the consequences of lack of personal responsibility. Moreover number of potential biases can contaminate the inferences that can be drawn from self-rated welfare measures (Ravallion and Lokshin (2001)). For instance measurement error, aggregation or distributional effects may cloud the reliability of the subjective responses. Unfortunately it is difficult to control for such behavioral characteristics as well as biases using standard regressors. However, these types of behavioral differences or deviations can be captured by using models that control for unobserved household heterogeneity (i.e. Random or Fixed effects methods). In this paper I use fixed effects to capture the household specific differences which are constant through time.

On the other hand financial difficulties are often caused by reasons that are not behavioral, and occur outside of the control of households. Litwin and Sapir (2009) emphasize that being unemployed or retired is associated with perceived financial difficulty. Winkelmann and Winkelmann (1998) showed that unemployment has a large detrimental effect on life satisfaction after individual specific fixed effects are controlled for. Kassenboehmer and Haisken-DeNew (2009) identify the importance of different reasons for unemployment (i.e. voluntary, forced etc.) on life satisfaction while Clark (2006) indicates the negative effect of unemployment duration on households' well-being. All these studies show that being unemployed is sharply associated with lower

levels of individual well-being and linked to perceived financial inadequacy.

Another external factor which may exhaust an important fraction of household income is the heavy use of credit and over-borrowing (Berthoud and Kempson (1992) Elliott (2005)). Draut and Silva (2003) indicate that in order to cope with the combined financial pressures of rising costs and stagnant or declining incomes, households are taking on more debt by draining their home equity and taking on record levels of credit card debt. Besides employment and debt related indicators, households' standard demographics also play a role in perceived financial inadequacy. In addition to household income, Stoller and Stoller (2003) identified health status and age to be the main predictors of perceived financial inadequacy where the effect of household size is illustrated for developing countries by Lanjouw and Ravallion (1995)

3 Econometric Framework

This study employs subjective measures of financial inadequacy as the variable of interest. Unlike objective measures, the responses to subjective questions are usually collected on an ordinal scale where the distances between ordinal ranks are not cardinally comparable across households.[1]

Even though in economic studies ordinal modelling such as ordered probit or logit models are commonly used, Ferrer-i-Carbonell and Frijters (2004) showed that employing individual specific effects that are constant through time is more important than the definition of the dependent variable. Since ordered logit or probit models do not allow for the inclusion of fixed effects,[2] I reduce ordinal variables to a binary form. The

[1]The major difference between the cardinality and ordinality assumption is the understanding of the relative difference of responses. From a cardinality perspective the relative difference between make ends meet scores have quantitative meaning which makes scores comparable across households. On the other hand ordinality assumes households share the same interpretation about the ordering but the relative difference in these scores is unknown. For instance from a cardinality perspective 4 means two times twice as good as 2 where from an ordinality perspective 4 is just better than 1,2,3.

[2]Although there are studies that try to develop bias corrections for ordered models (Carro and Traferri (2009)), they are not convenient to program and to implement for the applications as in this paper.

methodology used in this paper is to recode ordinal variables such that the value of 1 is assigned above a certain threshold and 0 otherwise (Winkelmann and Winkelmann (1998), Clark (2003)).[3]

I have employed two different threshold values for the binary recoding. First threshold value is determined by the country average of the making ends meet responses. If for a given household the ability to make ends meet exceeds the country average, a value of 1 is assigned to this household and 0 otherwise. Using this scheme the dependent variable for household i at time point t and at country c is recoded as

$$Y_{itc} = \begin{cases} 0 & \text{if } Y^*_{itc} \leq \overline{Y}_c \\ 1 & \text{if } Y^*_{itc} > \overline{Y}_c \end{cases} \quad \text{where } \overline{Y}_c = \sum_{i=1}^{N} \sum_{t=1}^{T} Y_{itc} \Big/ NT$$

The problem incorporated to the country threshold is to ignore variations that take place considerably below or above this threshold. As a result of this rounding, the dependent variable is recoded monotonically as 0 or 1. For instance if I assume the country average is at the 3^{rd} response level (make ends meet with some difficulty) and during the observation period a household provides changing responses but constantly below the 3^{rd} response level even though there is a variation in the responses of this particular household, these responses are always recoded as 0. A similar problem may also arise for the responses that are varying but constantly above country threshold and recoded as 1.

The monotonic recoding problem can be solved using the Kassenboehmer and Haisken-DeNew (2009) approach, which applies household specific thresholds over time. If for a given household the ability to make ends meet exceeds the household specific threshold (average of make ends meet responses for this household during the observation

[3]Das and Van Soest (1999) have developed an estimator which initially estimates fixed effects logit estimators for every particular ordinal interval and combine these estimates using a weighted average matrix. In addition to its incompatibility to dynamic models, this method does not permit the computation of marginal effects as it uses a standard fixed effects logit model to maintain the consistency of the estimates. Moreover in many applications there is not enough information for each ordinal category which is crucial for the computation of a weighting matrix to combine single binary estimates.

period), a value of 1 is assigned to this household and 0 otherwise. Using the above mentioned approach, the dependent variable for household i at time point t and at country c is recoded as

$$Y_{itc} = \begin{cases} 0 & \text{if } Y^*_{itc} \leq \overline{Y}_{ic} \\ 1 & \text{if } Y^*_{itc} > \overline{Y}_{ic} \end{cases} \quad \text{where } \overline{Y}_{ic} = \sum_{t=1}^{T} Y_{itc} \Big/ T$$

This type of recoding not only enables us to observe transitions at lower and higher response levels but also addresses personality traits in a more satisfactory way.

Using the two different binary recodings of the dependent variable a dynamic probit model with fixed effects as in Equation 1 is estimated.

$$Y_{itc} = 1\{\gamma Y_{it-1c} + \theta X'_{itc} + \alpha_{ic} - \epsilon_{itc}\} \tag{1}$$

Y_{itc} represents the binary outcome of household i at time t in country c, Y_{it-1c} is the lag of binary outcome, X'_{itc} are exogenous regressors, α_{ic} represents fixed effects and ϵ_{itc} is the normally distributed independent and identical error term.

Dynamic probit model with fixed effects

In a nonlinear panel data model with fixed effects as in Equation 1, the number of parameters (α_{ic}) to be estimated increases with the number of households in the sample. However, in many household panel surveys, the number of periods available is not long enough to model household heterogeneity appropriately. Short time spans lead to incidental parameters problem for standard likelihood methods (Neyman and Scott (1948)) because the information coming from fixed effects parameters stops accumulating after a finite number of periods which in turn distorts the consistency of maximum likelihood estimates. Given that estimates of fixed effects parameters depend only on the time span of the sample, this inconsistency is independent of the sample size and

exists even with large samples.

A plausible solution to the incidental parameters problem is to treat individual effects as parameters to be estimated in the model (Wooldridge (2002)). Although this type of methodology results in fixed-T inconsistency, it is possible to ask for approximately unbiased estimators instead of estimators with no bias at all.[4] The notion behind this idea is to compute the approximately unbiased estimator "θ_0", using the estimate of the bias "$\mathbb{B}$" and estimated biased estimator "θ_T" as in Equation 2.

$$\theta_T = \theta_0 + \frac{\mathbb{B}}{T} + \bigcirc(\frac{1}{T^2}) \tag{2}$$

In order to implement the method in Equation 2, one need to have an explicit formula for the asymptotic bias "$\mathbb{B}$".[5] To compute $\mathbb{B}$, I apply the method developed by Fernandez-Val (2009) which makes use of expected quantities. This method has better finite sample properties compared to other bias correction techniques and is less intense in terms of computation time.[6]

To start the bias correction, Equation 1 is estimated by the maximum likelihood method and biased estimates (θ_T) are obtained. Following exactly the notation by Fernandez-Val (2009), $\mathbb{B}$ is computed using the formula in Equation 3. Equations 4 and 5 exhibit the components of the asymptotic bias. Equation 4 represents the probability limit of the Jacobian of the estimating equation denoted by J while Equation 5 represents the bias of the estimating equation denoted by b. $u_{it\theta}$ and $v_{it\alpha}$ indicate the derivatives of the score functions with respect to structural and incidental parameters. The derivations of score functions as well as other parameters β_i, ψ_{is}, σ_i^2 and the

[4]Approximately unbiased estimators reduce the bias of the estimated coefficients to $1/T^2$ from $1/T$ (Arellano and Hahn (2005)).

[5]There are different approaches in computing this explicit formula. Some methods apply moment equations while others employ concentrated likelihoods. There are also methods by Cox and Reid (1987) and Lancaster (2002) which are based on orthogonality conditions.

[6]Bias Correction of the Moment Equation computes bias corrected estimates using estimating equation by constructing the estimator as a solution to the bias corrected version of the first-order conditions. There are two main approaches to deal with first order conditions. Observed quantities are used for the first case while likelihood setting expected quantities are employed for the second.

expansion of $\overline{E}_T$ are explained in the Appendix.

$$\begin{aligned}
\mathbb{B} &= J^{-1}b && (3)\\
J &= E_n\Big[E_T[u_{it\theta}] - E_T[u_{it\alpha}]\frac{E_T[\upsilon_{it\theta}]}{E_T[\upsilon_{it\alpha}]}\Big] && (4)\\
b &= E_n\Big[E_T[u_{it\alpha}]\beta_i + \overline{E}_T[u_{it\theta}\psi_{is}] + \frac{1}{2}\sigma_i^2 E_T[u_{it\alpha\alpha}]\Big] && (5)
\end{aligned}$$

Unbiased model parameters are obtained by subtracting the bias term from the biased parameters in Equation 2. Marginal effects are computed by inserting the model parameters and fixed effects to the marginal effect formula in Equation 6.

$$\mu(\hat{\theta}) = \frac{1}{n}\sum_{i=1}^{n} E_T[\tilde{m}(x_{it}, \theta, \hat{\alpha_i}(\theta))] \tag{6}$$

Marginal effects still suffer from the incidental parameters problem even if the model parameters are evaluated at their unbiased values. The source of this bias is that even though model parameters are corrected and unbiased, there is still bias, albeit to a lesser degree now, at the fixed effects parameters. For the evaluation of the marginal effects in Equation 6, both the model parameters and fixed effects are inserted. Hence, for the computation of the marginal effects a second stage of bias correction is needed. Approximately unbiased marginal effects are obtained following Equation 7.

$$\mu(\hat{\theta}) = \mu + \frac{1}{nT}\sum_{i=1}^{n}\Delta_i + \bigcirc(\frac{1}{T^2}) \tag{7}$$

where $\mu(\hat{\theta})$ represents the biased marginal effects and Δ_i the asymptotic bias of the marginal effects formulated in Equation 8.

$$\Delta_i = E_T[\tilde{m}_\alpha(X_{it}, \theta_0, \alpha_i)]\beta_i + \overline{E}_T[\tilde{m}_\alpha(X_{it}, \theta_0, \alpha_i)\psi_{is}] + \frac{1}{2}E_T[\tilde{m}_{\alpha\alpha}(X_{it}, \theta_0, \alpha_i)]\sigma_i^2 \tag{8}$$

with the subscripts on $\tilde{m}$ representing partial derivatives. Further derivations and

details on $\tilde{m}(X_{it}, \theta_0, \alpha_i)$ are delegated to the Appendix.

One last point to elaborate is in regards to the expectation $\overline{E}_T$ in which bandwidth parameters are employed. The inclusion of the bandwidth parameters for dynamic models is vital for the effectiveness of bias corrections. Choosing too large or too small bandwidth parameters results in a smaller fraction of the bias of the lagged dependent variable to be corrected where the issue of optimal bandwidth choice is important and very complicated. In this paper following Hahn and Kuersteiner (2011) and Fernandez-Val (2009) I employ the bandwidth parameter of 1 which is suggested for shorter panels.

4 Data and Descriptive Statistics

The data from European Community Household Panel (ECHP)[7] is used in this paper. ECHP survey was conducted annually across EU member states over the period 1994-2001. At ECHP over and above the information provided on employment, health status and social background at personal level, household characteristics such as basic demographics, financial characteristics and housing conditions are included at the household level. The standardized part of the questionnaire is designed in such a way that cross-nationality comparisons are possible.[8]

One of the main strengths of ECHP data is to contain subjective questions at household and individual level which reflect the household's opinions about their present financial well-being. The variable that is used as the dependent variable in this paper is derived from the household level subjective questions[9] regarding the financial situation. Respondents are asked

"A household may have different sources of income and more than one household member may contribute to it. Thinking of your household's total monthly income, is

[7]For the UK I have employed the British Household Panel Survey due to the fact that ECHP is conducted in this country for 3 periods only.

[8]Objectives, design and availability of ECHP can be found on ECHP web site http://circa.europa.eu/irc/dsis/echpanel/info/data/information.html.

[9]At individual level, satisfaction from financial situation is utilized as sensitivity analysis later on.

your household able to make ends meet?"

Responses have been recoded as: 1*"with great difficulty"*; 2 *"with difficulty"*; 3 *"with some difficulty"*; 4 *"fairly easily"*; 5 *"easily"* and 6 *"very easily"*.

In order to analyze this subjective question I posit: (i) Households are able to evaluate their ability to make ends meet, (ii) there is a positive monotonic relationship between the answers and households perception of financial inadequacy, (iii) the responses are comparable across households. Vignettes could be employed to shed light on the cross-country differences of subjective measures however neither ECHP nor EU-SILC address vignettes. For this reason I make an additional assumption that (iv) responses questions are comparable across different countries.

Table 1 presents the percentages of household responses for different categories of the making ends meet question. The pooled mean of 8 countries that have great difficulty is 9.01 % where at the other extreme the fraction is 2.79%. The list of countries is in ascending order according to the great difficulty category. the UK[10] followed by Belgium have the lowest percentage of households who are in great difficulty. In the UK with difficulty category has the lowest percentage as well. Denmark and France are the two countries with percentages around 5% for the lowest category. Italy, Spain, Portugal and Greece have the highest percentage of households who have great difficulty in making ends meet. Especially in Portugal and Greece percentages of households with great difficulty are around 15-20%. Lastly in southern countries such as France, Italy, Spain, Portugal and Greece very easily responses are very low compared to UK, Belgium and Denmark.

For the analysis of this paper I identify 16 household characteristics which can serve as indicators of making ends meet responses.[11] Following household income,[12] household demographics including age, education, marital and employment status are de-

[10]At the UK the making ends meet question has a scale of 1 to 5 instead of 6.

[11]List of all household characteristics as well as the definition of household head can be found in Appendix.

[12]Income variable is purchasing power parity adjusted and comparable across countries.

termined as major indicators. To address the household size I distinguish between the number of children and adults in a given household. Furthermore I include the dummy variable which indicates the presence of children younger than 12 years old in a given household. Finally variables such as paying mortgage debt or any other debt repayment as well as home ownership are employed to represent current household indebtedness and portfolio situation.

Summary statistics of the variables for all countries are in Table 2. The average age of the household heads in all countries is around 45 where the purchasing power parity adjusted incomes range from 16000-25000. Percentages of college graduates are small in Italy and Greece compared to the UK, Belgium and Denmark. Marriage rates are higher in southern countries where divorce rates are low. Both employment status and different components of household size are about the same among all countries with the exception that self employment rates are slightly higher in southern ones. Home ownership rates are high in Spain, Greece, Italy and the UK while mortgage and debt repayment rates are low for these countries apart from the UK. In these countries households seem to finance their home purchases thorough other resources than mortgage. Finally, the number of times the household head has been to a doctor during the last 12 months which is an indicator of household health[13] is about the same for all countries and at around 3 times per year.

5 Empirical Results

This section presents the key findings of the paper. First, I concentrate on the persistency marginal effects in different countries. The second subsection examines the additional effects of household characteristics on financial well-being. The final subsection focuses on the sub-group differences.

[13]Even though the employed health measure is an objective one, as mentioned by the referee there could be reverse causality related to this variable such that households who are not able to make ends meet may have health problems. Nevertheless my results are robust to the exclusion of this variable.

5.1 Persistency

An important contribution of this paper is to illustrate the subjective ability to make ends meet responses as a dynamic process while controlling for individual fixed effects. Row (1) of Table 3 presents the marginal effects of the lagged dependent category for the country mean[14] while Row (1) of Table 4 presents the same responses at the individual mean definition. For both specifications, the effect of lagged latent variable is positively significant among all countries. The smallest positive marginal effects are observed for Spain for both of the definitions. Subsequent to Spain, the UK and France have the smallest effects for country and individual mean definitions respectively. Greece and Portugal exhibit the highest positive effects followed by Italy. Belgium and Denmark indicate lower marginal effects with changing orders depending on the definition of the dependent variable.

It is important to emphasize the impact of bias corrections on the lagged dependent variables. The use of bias corrections as well as bandwidth parameters amends 3 types of errors. Without any bias correction, the effect of the lagged dependent variable is insignificant or statistically weakly significant in Denmark, the UK and Belgium depending on the definition of the dependent variable. For France and Spain the effects are insignificant or negatively significant again depending on the dependent variable formulation. Finally for Italy, Greece and Portugal marginal effects are positively significant however with low magnitudes. Exploiting the bias corrections along with bandwidth parameters the estimates which were previously insignificant or negatively significant become positively significant for 5 countries and for the countries where they were already positively significant, the magnitudes become stronger. The contribution of the bandwidth parameter here is to ameliorate a larger proportion of the bias due to the fact that bias corrections alone could be inefficient in correcting the entire bias of the dynamic term. A comparison of estimates of uncorrected, bias corrected without

[14]Only for the UK the country mean is rounded to the next integer as the UK has a scale of 1-5 instead of 1-6 of making ends meet responses.

bandwidth and bias corrected with bandwidth parameters is in the appendix.

Pudney (2008) relates the dynamic nature of perceptions to inertia such that higher state dependency of marginal effects implies a higher inertia rate with a lower adjustment rate of perceived financial inadequacy. Accordingly in southern countries such as Italy, Greece and Portugal household perceptions of financial difficulties exhibit higher inertia. Spain, the UK and France exhibit low inertia rates indicating that households in these countries tend to adjust to changing conditions faster. Countries such as Belgium and Denmark present the intermediate group with moderate inertia rates designating moderate adjustment habits. Besides household specific fixed effects, I have controlled for various household characteristics in my regressions. The positive significant inertia effects point out that perceptions of current well-being take time to fully adjust to changing circumstances. Moreover the variety of magnitudes of inertia effects show that adjustment rates could vary as a result of country specific factors.

The magnitudes of inertia marginal effects are economically highly significant and worth mentioning. Apart from Spain effects are constantly above 10% and as high as 20% for Greece and Portugal showing that almost one quarter of the perception of the financial well-being of Greek and Portuguese households are determined by their previous perceptions. Excluding Spain the lagged dependent variable has the largest positive effect among all the regressors employed including income and home ownership. This result states that over and above the household characteristics, previous perception of financial well-being is crucial for current perceptions.

The marginal effects of the lagged dependent variable for Spain are 7% and 9% for the country and individual mean definitions respectively. The low inertia effect in Spain is remarkable due to the fact that Spain together with Portugal and Greece is considered to be less generous in covering social risks. The European social statistics report (2002) constituted using ECHP data and objective income thresholds (60% or 70% median income level) indicates that Spain has one of the highest exit and re-entry

rate to at-risk-of poverty households after one year.[15] In addition to exit and re-entry rates, there is a high rate of temporary employment contracts and consequently unemployment turnover in Spain. The percentage of households which stopped working at their previous jobs or who are unemployed as a result of temporary employment contracts is the highest among 8 countries. Both of these factors may create adverse effects and lead Spanish households to become accustomed to changes in their financial situation and allow them to adjust faster to changing economic conditions. Controlling household specific effects, I demonstrate that the true state dependency for Spain is much lower than generally anticipated.

Various studies exploiting objective income thresholds (i.e.Jarvis and Jenkins (1998), Jenkins (2000)) document that financial problems or poverty are highly persistent in the UK. Contrary to objective measures, among 8 countries relatively low inertia effects (13% and 17%) in the UK demonstrate that UK households adjust their income to needs level swiftly and are still able to make ends meet. Among the European countries the UK is one of the most liberal ones with various types of economic freedom (i.e. business, financial, investment etc.) according to the economic freedom ranking of the Heritage Foundation. The economic system in the UK may support households by allowing them easier access to adjustment channels. For instance through easier access to bank credit, UK households may appeal to bank loans in the presence of economic upheavals. Again addressing the true state dependency, I reveal that the UK has a remarkable inertia rate which may be due to country specific reasons.

France displays a lower inertia rate (13%) for individual mean definition in addition to the third lowest rate (14%) for the country mean definition. Stated at the OECD Economic Survey of 2007, France's minimum wage (the SMIC) is the highest among the OECD countries which is often considered as a means of combating household financial inadequacy. Also indicated in the same report, income inequality in France

[15]With the beginning of the 80's the institutionalization of social services and assistance began in Spain thereby creating social protection. As mentioned by Matsaganis et al. (2003) Spain using a decentralized approach, enforced in some regions a minimum income as a legal right, while adapting more cautious, discretionary approaches within limited resources in other regions.

declined sharply during the 1970s and 1980s which is accompanied by the fall in the risk of financial inadequacy. As a result of these policies French households may have shorter term income-to-needs adjustment periods and exhibit less inertia.

In Belgium and Denmark the marginal effects of the inertia rates are between 15%-17% for both of the definitions of the dependent variable. Employing objective income thresholds the European social statistics report (2002) documents that in Belgium and Denmark not only income poverty but also the risk of persistent poverty is low. Moreover exit rates from poverty are high whereas re-entry rates are small. Nevertheless the positive marginal effects of inertia rates reveal that high exit rates from objectively defined poverty statistics or low persistent poverty risk is not automatically related to higher adjustment speeds or lower inertia rates for these two countries.

Inertia effects are above 20% in Portugal and Greece followed by Italy with rates around 17% to 19%. It is known that southern countries such as Greece, Portugal and Italy are less successful in dealing with current and persistent poverty (Ferreira (2008)). For instance in Portugal, more than half of the population was affected by persistent poverty in 1996, while in Greece, the figure was only slightly less. Households in these countries may cope with financial difficulties for a short period, however they are unable to overcome these difficulties over the longer term given their needs. The compound effect of lack of resources and recurring demands, makes it difficult for households to manage financial problems on an ongoing basis and this may induce inertia.

5.2 Socio-Economic Factors

In addition to the lagged dependent variable, Table 3 and 4 demonstrate the impact of the marginal effects of household characteristics for the present period for both definitions of the dependent variable. For both specifications, sign and significance of the variables are robust and the magnitudes of the marginal effects are economically significant. I present my discussions by addressing the significant effects for both of

the specifications.

Previous literature documents household income as an important indicator of general and financial well-being as well as ability to make ends meet (Clark (2006), Ferrer-i-Carbonell (2005), Newman et al. (2008)). My results are matched up with the previous findings that household income has a positive and significant effect (around 10%) on ability to make ends meet for all countries. In my regressions marital status is fractionalized to being married, divorced or widowed. Being married has no significant effect on making ends meet. By contrast divorce has a negative effect in the UK and Belgium with 8% and 25% marginal effects respectively. Being widowed is only negatively significant in Belgium. In southern countries such as Italy, Spain, Portugal and Greece neither being divorced (with the exception of Italy having a negative sign for being divorced for the country mean definition) nor being widowed has a negative impact on present periods financial well-being a fact which could be an outcome of stronger family ties.

The employment status is another essential factor that affects the ability to make ends meet. Kassenboehmer and Haisken-DeNew (2009) point out the importance of unemployment on households' well-being where Litwin and Sapir (2009) assign it as the second strongest predictor of the ability to make ends meet. For all countries being unemployed strongly decreases financial well-being with marginal effects from 14% to 25%. Nevertheless being retired or the total number of retirees in a given household seems to have no influence. Only in Belgium does being retired have a negative impact of 20%. There is also a positive effect of being self employed in southern countries such as Spain, Portugal and Greece which are less than 10%. Other negative indicators are the different components of household size. For instance excluding Belgium and Greece, an increase in the number of adults has 2-5% and an additional child in a given household has a 3-7% negative effect. Childrens' ages seem to indicate no significance for any of the countries.

Debt repayment dummies such as mortgage debt and debt repayment other than

mortgage provide similar results in terms of sign and significance for both specifications. Debt repayment other that mortgage has a negative effect for almost all countries with marginal effects of around 6-10%. In Denmark there is no significant effect of debt repayment. Mortgage debt should be evaluated together with home ownership. During adverse economic conditions, where unemployment rates rise and household assets depreciate in value, households may be unable to pay off their loans which in turn affects their ability to make ends meet. However the negative effects of mortgage debt may be set off by the financial benefits of home ownership. Although mortgage debt has a negative effect for all countries, being a homeowner in Denmark, Italy and Portugal has shattered part of the negative effect of mortgage repayment whereas at the UK and Greece the negative effect of the mortgage debt is even dominated by the positive effect of home ownership. The number of doctor visits in a year which is a proxy for health status decreases the likeliness of ability to make ends meet with marginal effects around 2%. Health problems are associated with higher income uncertainty and increased medical expenses. Therefore a better health status implies fewer expenses and fewer difficulties in making ends meet.

5.3 Sub-samples

Following Blanchflower and Oswald (2004) I split the sample into different groups and report inertia effects for age and education sub-samples separately. Column 1 of Table 5 presents the sample younger than 45 where column 2 presents the sample older than 45. For all countries other than Italy younger households seem to be more inert compared to older households. Danziger (1984), Stoller and Stoller (2003) addressed the importance of age on making ends meet and found that elderly people generally find their income to be adequate, even when those incomes are relatively low. However if I concentrate on the magnitudes of the inertia effects, it is seen that these differences are mostly small. The UK is the only country with a significant age effect for the previous regressions and demonstrates a 6% difference of lagged dependent variables

between younger and older households at the sub-samples.

Column 3 and 4 of Table 5 present inertia effects for the non-college and college graduates separately. The differences are again small and even economically negligible for Italy and Spain. Even though education is documented to be an important indicator of financial well-being, it has little influence on its dynamics. Only in Denmark there is a 5% difference between college and non-college graduates where non-college graduates seem to indicate higher adjustment rates.

6 Robustness and Sensitivity Analysis

Table 6 shows the correlation matrix of various subjective satisfaction questions asked in the ECHP questionnaire. Concentrating on the ability to make ends meet I observe that the highest correlation is achieved for financial satisfaction with a value of 0.61 followed by satisfaction from earnings with a value of 0.46. Satisfaction from housing or work seems to correlate to a lesser extent (around 0.3) while satisfaction from leisure has the lowest correlation coefficient of 0.16. For a sensitivity analysis I exploit financial satisfaction as the dependent variable which is derived from the individual part of the ECHP questionnaire and I apply the probit model from equation 1. Respondents are asked rabout their *satisfaction with the financial situation* which they may respond to on a scale from 1 to 6, 1 representing not satisfied and 6 representing fully satisfied.

Row (1) of Table 7 presents marginal effects[16] of the inertia coefficients for 8 EU countries. Confirming my previous findings, Spain has the lowest marginal effect of 7% suggesting a low inertia rate in contrast to Portugal and Greece with high marginal effects (24% and 19% respectively) displaying higher inertia. The UK, Belgium, Denmark, France and Italy demonstrate positive significant marginal effects (around 15%) of the lagged dependent variable suggesting that financial satisfaction along with making ends meet is a state dependent variable for all countries.

[16]Dependent variable is recoded using individual level mean.

Turning to socio-economic factors, with the exception of Belgium, the income and health proxy have approximately the same positive effects across all countries which is analogous to my previous results. The number of adults along with the number of children has a negative impact on financial satisfaction. Being unemployed makes households more likely to be financially dissatisfied while being retired or self-employed does not have a significant impact on financial satisfaction. In the UK having mortgage debt is associated with lower levels of financial satisfaction which is statistically highly significant. Other than the UK, mortgage debt is insignificant for the rest of the countries. Having debt other than mortgage is also associated with lower levels of financial satisfaction but to a lesser degree compared to the ability to make ends meet. Only in the UK and Denmark is the degree larger. It can be concluded that individuals are generally aware of the additional difficulty of making ends meet when being indebted but still financially satisfied in spite of their debt. Finally home ownership generally adds no significant positive impact to financial satisfaction other than in Spain. The magnitudes and ordering of the results coincide with Table 4 indicating that my previous results for the ability to make ends meet as dependent variable are robust.

It could be argued that lagged dependent variables capture previous positive or negative shocks which occurred at the former periods household characteristics (i.e. an unexpected increase or decrease in income). To address this argument, I employ the lags of the regressors (X_{t-1}) in stead of their current values as a further sensitivity analysis. I perform this new robustness check for both country and individual mean definitions of make ends meet responses. For the sake of brevity, the estimation results are not reported, nevertheless, they are available upon request. I observe that the coefficients of the lagged regressors are still strictly significant and slightly larger in all countries. Specifically the estimated marginal effects increased by 1-2% compared with the original results. Moreover many of the regressors other than the lagged dependent variable become insignificant. This indicates that my modelling scheme of

employing lagged dependent variable with current regressors is appropriate. Finally I allow for a higher bandwidth value at the original model and observe that choosing a bandwidth parameter of 2 does not make a difference in terms of significance or sign in my specifications.

7 Conclusion

This article has addressed the question whether perceived financial inadequacy is persistent in 8 European countries controlling for individual specific time invariant effects. Responses from the question of the ability to make ends meet of the ECHP is utilized as a subjective financial inadequacy measure where financial satisfaction is employed for sensitivity analysis. Employing subjective measures that allow controlling both for income and consumption characteristics of households, I have demonstrated the importance of dynamics of perceived financial wellbeing for my empirical implementation.

Dynamic nature of perceptions is related to inertia and adjustment rate of financial inadequacy of households. My results point out that European countries are far from being identical in terms of their inertia rates and perceptions of current financial wellbeing take time to adjust fully to changed circumstances. There is a spectrum of results from low (Spain, UK and France) to moderate (Belgium and Denmark) along with relatively high (Italy, Greece and Portugal) inertia rates. As a result of country specific factors, inertia rates may differ between countries.

Much of the research on perceived financial inadequacy underestimates the importance of individual specific time invariant effects modeling this subjective concept in a dynamic manner. My paper indicates that using models that account for time invariant individual heterogeneity is important and several variables used in the economic literature demonstrate different inferences when fixed individual effects are taken into account. Moreover with the use of fixed effects, the argument of spurious state dependency is eliminated.

To conclude, I provide the appropriate modeling scheme for perceived financial inadequacy by addressing individual heterogeneity and time persistency. My results suggest that further research on this topic is necessary. Future research which, for instance examines reference income group effects would be a strong extension to this work.

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Table 1: **Descriptive Overview of Making Ends Meet Responses**

	With Great Difficulty	**With Diffuculty**	**With Some Difficulty**	**Fairly Easily**	**Easily**	**Very Easily**
United Kingdom (UK)	2.62	5.57	25.44	36.20	30.18	
Belgium (BE)	5.04	8.60	21.52	35.32	24.42	5.10
Denmark (DK)	5.14	7.21	20.49	35.24	21.70	10.22
France (FR)	5.36	11.66	27.85	40.33	14.23	0.57
Italy (IT)	8.10	12.76	36.88	32.17	8.69	1.40
Spain (SP)	13.04	17.08	32.56	25.44	10.86	1.02
Portugal (PT)	13.37	22.36	42.25	17.87	3.74	0.41
Greece (GR)	19.43	32.20	26.75	14.81	5.99	0.81
Total	9.01	14.68	29.22	29.67	14.98	2.79

Note: This table presents percentage of responses to different levels of ability to make ends meet question across countries. The time span being a balanced panel is from 1994 to 2001. For the UK ability to make ends meet responses are collected on a scale of 1 to 5. For all other countries scale is from 1 to 6.

Table 2: Summary Statistics of Variables

	UK		**BE**		**DK**		**FR**		**IT**		**SP**		**PT**		**GR**	
VARIABLES	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ
Age	44	13	46	13	44	14	45	13	48	12	48	13	49	13	49	13
Income	28104	20046	28630	27267	24968	14925	24679	20512	22143	14555	20446	15308	16009	12922	17413	13660
College	0.50	0.50	0.33	0.47	0.31	0.46	0.22	0.41	0.09	0.28	0.19	0.40	0.06	0.24	0.18	0.38
Married	0.55	0.50	0.62	0.49	0.47	0.50	0.58	0.49	0.79	0.41	0.76	0.43	0.77	0.42	0.80	0.40
Divorced	0.16	0.36	0.16	0.36	0.14	0.35	0.10	0.30	0.04	0.19	0.04	0.20	0.05	0.22	0.03	0.18
Widowed	0.04	0.20	0.06	0.23	0.04	0.20	0.06	0.23	0.06	0.23	0.06	0.24	0.08	0.27	0.07	0.26
Self-empl.	0.11	0.31	0.11	0.31	0.06	0.24	0.08	0.27	0.21	0.41	0.16	0.37	0.23	0.42	0.32	0.46
Retired	0.12	0.32	0.18	0.39	0.15	0.35	0.19	0.39	0.23	0.42	0.15	0.36	0.18	0.38	0.22	0.42
Unemployed	0.03	0.18	0.07	0.25	0.05	0.23	0.06	0.23	0.04	0.20	0.08	0.27	0.03	0.17	0.03	0.18
Child<12	0.29	0.45	0.28	0.45	0.28	0.45	0.31	0.46	0.30	0.46	0.31	0.46	0.30	0.46	0.29	0.46
#Child	0.67	1.02	0.72	1.05	0.59	0.94	0.68	1.01	0.60	0.86	0.64	0.90	0.68	0.98	0.65	0.92
#Adults	2.00	0.80	2.10	0.90	1.80	0.70	2.10	0.90	2.60	1.10	2.70	1.20	2.60	1.10	2.50	1.00
Homeowner	0.73	0.45	0.69	0.46	0.64	0.48	0.56	0.50	0.75	0.44	0.82	0.39	0.69	0.46	0.78	0.41
Health	3.40	0.80	3.30	1.30	2.90	1.10			2.80	1.30	2.70	1.40	2.60	1.30	2.40	1.30
Mortgage	0.53	0.50	0.41	0.49	0.58	0.49	0.31	0.46	0.14	0.35	0.24	0.43	0.17	0.38	0.09	0.29
Debt	0.35	0.48	0.27	0.44	0.52	0.50	0.40	0.49	0.13	0.33	0.23	0.42	0.15	0.36	0.12	0.32

Note: This table presents summary statistics of the regressors employed. μ and σ denote the mean value and standard deviation of the variables respectively. Income variable is purchasing power parity adjusted. Objective health variable is missing for France.

Table 3: Marginal effects using country averages

	UK	BE	DK	FR	IT	SP	PT	GR
MeM$_{t-1}$	0.130***	0.157***	0.165***	0.143***	0.166***	0.065***	0.221***	0.202***
	(12.456)	(9.017)	(10.911)	(14.574)	(18.640)	(6.552)	(20.085)	(21.044)
Age	0.005**	0.006	-0.001	0.004	-0.005*	0.000	-0.001	0.001
	(2.154)	(1.594)	(-0.271)	(1.594)	(-1.898)	(0.223)	(-0.724)	(0.415)
Income	0.115***	0.113***	0.104***	0.115***	0.091***	0.132***	0.109***	0.145***
	(6.750)	(5.881)	(5.001)	(8.896)	(8.223)	(10.253)	(9.879)	(11.533)
College	0.006	0.008	0.045*	0.014	0.031	0.030	0.078	-0.002
	(0.334)	(0.200)	(1.836)	(0.400)	(0.460)	(1.162)	(0.678)	(-0.059)
Married	0.012	-0.112	0.012	0.059	0.096	0.057	0.026	-0.029
	(0.323)	(-1.349)	(0.318)	(1.415)	(1.485)	(0.922)	(0.544)	(-0.412)
Divorced	-0.092**	-0.243***	-0.056	-0.098*	-0.234***	-0.096	-0.073	-0.005
	(-2.020)	(-2.875)	(-1.191)	(-1.909)	(-2.715)	(-1.304)	(-1.160)	(-0.044)
Widowed	0.031	-0.274**	-0.051	-0.009	0.015	0.026	-0.025	-0.047
	(0.450)	(-2.552)	(-0.584)	(-0.144)	(0.201)	(0.353)	(-0.428)	(-0.607)
Self-empl.	0.042	-0.009	-0.030	0.056	0.039	0.081***	0.046*	0.075***
	(1.641)	(-0.131)	(-0.596)	(1.365)	(1.570)	(3.149)	(1.787)	(3.098)
Retired	0.024	-0.191**	0.008	-0.020	-0.016	-0.062	0.031	0.040
	(0.518)	(-2.129)	(0.109)	(-0.418)	(-0.432)	(-1.260)	(0.777)	(0.997)
Unemployed	-0.163***	-0.270***	-0.232***	-0.198***	-0.151***	-0.164***	-0.162***	-0.164***
	(-3.779)	(-5.269)	(-6.111)	(-6.277)	(-3.731)	(-6.658)	(-4.604)	(-4.079)
#Retired	-0.062*	0.044	-0.028	-0.006	0.028	0.042	-0.031	-0.006
	(-1.875)	(0.614)	(-0.540)	(-0.182)	(0.957)	(0.999)	(-1.085)	(-0.224)
Child<12	-0.051**	0.029	0.046	-0.034	0.000	-0.036	0.018	0.048**
	(-2.117)	(1.112)	(1.415)	(-1.334)	(0.007)	(-1.576)	(0.789)	(1.965)
#Child	-0.076***	-0.014	-0.064***	0.003	-0.011	-0.045***	-0.039**	-0.018
	(-4.844)	(-0.625)	(-3.359)	(0.210)	(-0.727)	(-3.071)	(-2.568)	(-1.102)
#Adults	-0.026*	-0.010	-0.043**	-0.022*	-0.028**	-0.051***	-0.024**	-0.015
	(-1.913)	(-0.480)	(-2.287)	(-1.768)	(-2.413)	(-4.706)	(-2.063)	(-1.141)
Homeowner	0.168***	0.080	0.177***	0.007	0.041*	-0.006	0.094***	0.103***
	(4.590)	(1.578)	(2.804)	(0.210)	(1.693)	(-0.223)	(2.978)	(3.777)
Health	-0.016**	0.004	-0.010		-0.005	-0.006	-0.011**	-0.018***
	(-2.117)	(0.491)	(-1.259)		(-1.283)	(-1.321)	(-2.145)	(-3.921)
Mortgage	-0.152***	-0.085**	-0.152***	-0.085***	-0.112***	-0.084***	-0.141***	-0.071***
	(-5.878)	(-2.319)	(-2.618)	(-3.843)	(-5.662)	(-4.865)	(-4.812)	(-2.863)
Debt	-0.019	-0.074***	-0.057***	-0.035***	-0.064***	-0.086***	-0.078***	-0.065***
	(-1.485)	(-3.432)	(-3.043)	(-2.839)	(-4.410)	(-7.021)	(-4.344)	(-3.800)
Likelihood	-4837	-1877	-2524	-4935	-5889	-5125	-4180	-4744
Sample-size	9072	3500	4592	9226	11319	9814	7763	8743

Note: This table presents the regression results for ability to make ends meet using country means as cutoff in order to define the dependent variable. Income variable is in logs. In parenthesis are t-statistics. All specifications include time dummies. ***$p < 0.01$; **$p < 0.05$; *$p < 0.10$.

Table 4: Marginal effects using individual averages

	UK	BE	DK	FR	IT	SP	PT	GR
MeM$_{t-1}$	0.171***	0.158***	0.175***	0.129***	0.188***	0.086***	0.251***	0.219***
	(21.032)	(14.033)	(16.739)	(17.342)	(25.952)	(10.981)	(31.691)	(26.452)
Age	0.004**	0.004	0.002	0.005**	-0.003	-0.002	-0.001	0.000
	(2.104)	(1.175)	(0.995)	(2.385)	(-1.338)	(-0.915)	(-0.988)	(0.044)
Income	0.095***	0.113***	0.131***	0.095***	0.075***	0.086***	0.097***	0.141***
	(8.650)	(6.264)	(6.317)	(8.144)	(8.347)	(10.406)	(8.906)	(11.939)
College	0.023	0.006	0.020	0.053*	-0.001	0.009	0.140**	-0.006
	(1.493)	(0.188)	(1.030)	(1.897)	(-0.024)	(0.387)	(2.357)	(-0.245)
Married	0.010	-0.032	0.026	0.013	0.081	0.165***	0.043	0.001
	(0.322)	(-0.454)	(0.772)	(0.365)	(1.554)	(3.006)	(1.063)	(0.023)
Divorced	-0.073**	-0.250***	-0.071*	-0.094**	-0.103	0.056	-0.057	-0.062
	(-2.095)	(-3.394)	(-1.653)	(-2.211)	(-1.567)	(0.894)	(-1.119)	(-0.777)
Widowed	-0.043	-0.198**	-0.038	-0.081	0.003	0.162**	-0.043	-0.018
	(-0.751)	(-2.127)	(-0.485)	(-1.502)	(0.054)	(2.504)	(-0.872)	(-0.256)
Self-empl.	0.040*	0.029	-0.095**	0.026	0.023	0.029	0.030	0.048**
	(1.890)	(0.587)	(-2.210)	(0.716)	(1.067)	(1.247)	(1.383)	(2.182)
Retired	0.040	-0.151**	-0.097*	-0.051	0.026	-0.105**	0.041	-0.003
	(0.912)	(-2.238)	(-1.785)	(-1.412)	(0.781)	(-2.408)	(1.244)	(-0.084)
Unemployed	-0.275***	-0.140***	-0.207***	-0.199***	-0.128***	-0.162***	-0.153***	-0.160***
	(-9.458)	(-3.407)	(-6.524)	(-8.022)	(-4.554)	(-8.640)	(-5.177)	(-4.871)
#Retired	-0.080***	0.024	-0.022	0.013	-0.018	0.084**	-0.021	0.038
	(-2.587)	(0.461)	(-0.557)	(0.494)	(-0.700)	(2.224)	(-0.896)	(1.497)
Child<12	-0.034*	0.018	0.010	-0.011	-0.019	-0.012	0.032*	0.006
	(-1.792)	(0.945)	(0.381)	(-0.559)	(-0.967)	(-0.623)	(1.646)	(0.260)
#Child	-0.070***	-0.039**	-0.084***	-0.008	-0.031**	-0.045***	-0.044***	-0.026*
	(-5.766)	(-2.226)	(-5.108)	(-0.720)	(-2.401)	(-3.604)	(-3.617)	(-1.834)
#Adults	-0.023**	-0.021	-0.039**	-0.020**	-0.019*	-0.029***	-0.027***	-0.025**
	(-2.145)	(-1.304)	(-2.492)	(-2.011)	(-1.885)	(-3.181)	(-2.786)	(-2.207)
Homeowner	0.092***	0.050	0.032	0.009	0.045**	0.030	0.039	0.107***
	(2.986)	(1.215)	(0.711)	(0.347)	(2.139)	(1.370)	(1.520)	(4.294)
Health	-0.025***	-0.004	-0.007		-0.005	-0.010***	-0.006	-0.017***
	(-4.009)	(-0.630)	(-1.040)		(-1.446)	(-2.691)	(-1.317)	(-4.180)
Mortgage	-0.107***	-0.098***	-0.109***	-0.092***	-0.091***	-0.081***	-0.076***	-0.030
	(-4.667)	(-3.489)	(-2.779)	(-5.387)	(-5.211)	(-5.395)	(-3.206)	(-1.345)
Debt	-0.016	-0.062***	-0.075***	-0.020**	-0.060***	-0.095***	-0.080***	-0.082***
	(-1.501)	(-3.616)	(-4.930)	(-2.057)	(-4.800)	(-8.983)	(-5.483)	(-5.340)
Likelihood	-7873	-4103	-4648	-9270	-9494	-9106	-6943	-7390
Sample-size	13797	7000	7861	16142	16800	15302	12292	12516

Note: This table presents the regression results for ability to make ends meet using individual means as cutoff in order to define the dependent variable. Income variable is in logs. In parenthesis are t-statistics. All specifications include time dummies. ***$p < 0.01$; **$p < 0.05$; *$p < 0.10$.

Table 5: Differentiating between sub-samples

$\mathbf{MeM_{t-1}}$	**Age<45**	**Age≥45**	**Non-College**	**College**
UK	0.186***	0.130***	0.160***	0.188***
	(15.534)	(12.348)	(11.323)	(12.524)
BE	0.177***	0.159***	0.152***	0.139***
	(10.206)	(11.390)	(10.157)	(6.215)
DK	0.175***	0.162***	0.172***	0.216***
	(10.836)	(11.887)	(11.325)	(8.383)
FR	0.123***	0.118***	0.127***	0.115***
	(10.052)	(12.973)	(14.766)	(6.405)
IT	0.181***	0.203***	0.186***	0.188***
	(13.155)	(25.463)	(24.397)	(6.868)
SP	0.102***	0.082***	0.085***	0.084***
	(7.069)	(9.921)	(9.188)	(3.848)
PT	0.269***	0.262***	0.248***	0.218***
	(17.306)	(32.091)	(30.227)	(5.156)
GR	0.250***	0.234***	0.221***	0.208***
	(15.355)	(27.698)	(22.921)	(8.546)

Note: This table presents the regression results for sub-sample regressions using individual means as cutoff in order to define the dependent variable. Income variable is in logs. In parenthesis are t-statistics. All specifications include time dummies. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.10$. All regressions are run with full set of regressors. Reported coefficients are only for lagged dependent variable.

Table 6: Correlation matrix of satisfaction responses

Make Ends Meet	1.0000					
Satisfaction Financial	0.6140	1.0000				
Satisfaction Earnings	0.4640	0.7071	1.0000			
Satisfaction Work	0.3212	0.5180	0.4852	1.0000		
Satisfaction Housing	0.3162	0.4315	0.3291	0.3885	1.0000	
Satisfaction Leisure	0.1616	0.2876	0.2506	0.2905	0.2749	1.0000

Note: This table presents the correlation matrix of various subjective satisfaction measures. Satisfaction from financial situation, work, housing and leisure are the questions with identities of *PK001-4* at ECHP. Satisfaction from earnings has identity of *PE031*.

Table 7: Marginal Effects for financial satisfaction using individual averages

	UK	BE	DK	FR	IT	SP	PT	GR
FS_{t-1}	0.168***	0.144***	0.162***	0.144***	0.169***	0.067***	0.235***	0.184***
	(21.050)	(12.433)	(14.826)	(19.605)	(23.592)	(8.296)	(30.003)	(22.543)
Age	0.002	-0.000	0.001	-0.001	-0.003	0.001	-0.004***	-0.002
	(1.347)	(-0.017)	(0.431)	(-0.337)	(-1.464)	(0.415)	(-3.075)	(-0.825)
Income	0.092***	0.041**	0.130***	0.067***	0.086***	0.087***	0.094***	0.156***
	(8.289)	(2.227)	(6.435)	(5.402)	(9.374)	(9.437)	(8.560)	(13.911)
College	0.016	0.030	0.071***	-0.005	-0.026	0.032	-0.031	0.021
	(1.008)	(0.989)	(3.488)	(-0.196)	(-0.433)	(1.281)	(-0.526)	(0.795)
Married	-0.009	-0.031	0.048	0.057	0.144***	0.050	0.072*	0.024
	(-0.305)	(-0.442)	(1.381)	(1.613)	(2.630)	(0.875)	(1.814)	(0.379)
Divorced	-0.105***	-0.199***	-0.020	0.004	0.018	-0.040	-0.087*	-0.078
	(-3.065)	(-2.691)	(-0.459)	(0.089)	(0.263)	(-0.607)	(-1.690)	(-0.964)
Widowed	-0.046	-0.231**	0.090	0.082	0.117*	-0.106	0.054	0.000
	(-0.807)	(-2.460)	(1.100)	(1.533)	(1.758)	(-1.581)	(1.120)	(0.000)
Self-empl.	0.033	-0.124**	-0.052	-0.051	0.038*	0.026	0.008	0.049**
	(1.564)	(-2.449)	(-1.148)	(-1.366)	(1.663)	(1.076)	(0.398)	(2.262)
Retired	-0.007	-0.107	0.026	-0.025	-0.049	-0.078*	-0.038	0.042
	(-0.155)	(-1.603)	(0.448)	(-0.674)	(-1.450)	(-1.704)	(-1.172)	(1.182)
Unemployed	-0.279***	-0.199***	-0.244***	-0.275***	-0.330***	-0.214***	-0.343***	-0.230***
	(-9.733)	(-4.754)	(-7.599)	(-10.766)	(-10.483)	(-10.731)	(-11.644)	(-7.051)
#Retired	-0.044	0.035	-0.005	0.024	0.027	0.083**	0.018	-0.016
	(-1.398)	(0.690)	(-0.117)	(0.896)	(1.019)	(2.096)	(0.760)	(-0.644)
Child<12	-0.045**	0.005	0.005	-0.022	-0.004	0.036*	-0.001	0.007
	(-2.334)	(0.262)	(0.170)	(-1.093)	(-0.202)	(1.771)	(-0.028)	(0.303)
#Child	-0.063***	-0.018	-0.069***	0.026**	-0.043***	-0.055***	0.004	-0.046***
	(-5.230)	(-0.958)	(-4.033)	(2.228)	(-3.168)	(-4.245)	(0.370)	(-3.224)
#Adults	-0.017	0.027	-0.059***	-0.000	-0.013	-0.041***	-0.000	-0.030***
	(-1.593)	(1.580)	(-3.608)	(-0.009)	(-1.282)	(-4.280)	(-0.013)	(-2.587)
Homeowner	0.075**	0.094**	0.078*	-0.002	0.046**	0.066***	0.041	0.044*
	(2.443)	(2.221)	(1.690)	(-0.093)	(2.102)	(2.933)	(1.590)	(1.773)
Health	-0.028***	-0.011*	0.000		-0.006*	-0.019***	-0.004	-0.017***
	(-4.427)	(-1.692)	(0.057)		(-1.737)	(-4.926)	(-1.031)	(-4.312)
Mortgage	-0.075***	-0.061**	-0.076*	-0.036**	-0.027	-0.020	-0.042*	-0.039*
	(-3.244)	(-2.145)	(-1.914)	(-2.095)	(-1.501)	(-1.313)	(-1.800)	(-1.741)
Debt	-0.023**	-0.035**	-0.040**	-0.030***	-0.027**	-0.022**	-0.046***	-0.059***
	(-2.161)	(-1.987)	(-2.512)	(-3.011)	(-2.091)	(-2.025)	(-3.224)	(-3.795)
Likelihood	-7893	-4071	-4428	-9846	-10247	-9034	-7840	-7612
Sample-size	13874	6790	7378	16471	17010	14735	13398	12754

Note: This table presents the regressions for financial satisfaction using individual means as cutoff in order to define the dependent variable. Income variable is in logs. In parenthesis are t-statistics. All specifications include time dummies. ***$p < 0.01$; **$p < 0.05$; *$p < 0.10$.

APPENDIX

Dynamic probit model with fixed effects

The conditional log-likelihood of binary variable Y_{it} at time t for observation i is given by l_{it}

$$l_{it}(\theta, \alpha) = Y_{it} \log(F_{it}(\theta, \alpha_i)) + (1 - Y_{it}) \log(1 - F_{it}(\theta, \alpha_i))$$

where F_{it} denotes the CDF of the corresponding distribution, θ index coefficients and α_i the unobserved fixed effects.

u_{it} and υ_{it} denote the first derivatives (score functions) of the conditional log-likelihood with respect to index coefficients and fixed effects respectively.

$$u_{it}(\theta, \alpha) = \frac{\partial}{\partial \theta} l_{it}(\theta, \alpha) \qquad \upsilon_{it}(\theta, \alpha) = \frac{\partial}{\partial \alpha} l_{it}(\theta, \alpha)$$

Additional subscripts of u_{it} and υ_{it} denote partial derivatives of score functions with respect to index coefficients and fixed effects.

$$u_{it\alpha}(\theta, \alpha) = \frac{\partial}{\partial \alpha} \frac{\partial}{\partial \theta} l_{it}(\theta, \alpha) \qquad \upsilon_{it\alpha}(\theta, \alpha) = \frac{\partial}{\partial \alpha} \frac{\partial}{\partial \alpha} l_{it}(\theta, \alpha)$$

$$u_{it\theta}(\theta, \alpha) = \frac{\partial}{\partial \theta} \frac{\partial}{\partial \theta} l_{it}(\theta, \alpha) \qquad \upsilon_{it\theta}(\theta, \alpha) = \frac{\partial}{\partial \theta} \frac{\partial}{\partial \alpha} l_{it}(\theta, \alpha)$$

Spectral expectation $\overline{E}_T[h_{it}k_{is}]$ represents the expectation for the dynamic models where bandwidth parameter J enters and needs to be chosen such that $J = J/T^{\frac{1}{2}} \to 0$ as $T \to \infty$

$$\overline{E}_T[h_{it}k_{is}] = \frac{1}{T - j} \sum_{j=1}^{J} \sum_{t=j+1}^{T} E_T[h_{it}k_{i,t-j}]$$

σ_i^2 and ψ_{is} are the estimators of the asymptotic variance and influence function respectively.

$$\sigma_i^2 = \overline{E}_T[\psi_{it}\psi_{is}]$$

$$\psi_{is} = -E_T[\upsilon_{it\alpha}]^{-1}\upsilon_{it}$$

β_i is the higher order expansion for the estimator of the individual effects $\hat{\alpha}_i$

$$\begin{aligned}
\beta_i &= -E_T[\upsilon_{it\alpha}]^{-1}\left[\overline{E}_T[\upsilon_{it\alpha}\psi_{is}] + \frac{1}{2}\sigma_i^2 E_T[\upsilon_{it\alpha\alpha}]\right] \\
\hat{\alpha}_i &= \alpha_i + \psi_i/\sqrt{T} + \beta_i/T + o(1/T)
\end{aligned}$$

$\tilde{m}(x_{it}, \theta, \alpha_i)$ denotes marginal effects for a continuous variable where $m(x_{it}, \theta, \alpha_i)$ is the discrete version

$$\begin{aligned}
\tilde{m}(x_{it}, \theta, \alpha_i) &= \frac{\partial}{\partial x_{it}} F(x_{it}\theta + \alpha_i | X_{it}, \alpha_i) = \theta f(x_{it}\theta + \alpha_i | X_{it}, \alpha_i) \\
m(x_{it}, \theta, \alpha_i) &= F((x_{it}+1)\theta + \alpha_i | X_{it}, \alpha_i) - F(x_{it}\theta + \alpha_i | X_{it}, \alpha_i)
\end{aligned}$$

Finally additional subscripts represent partial derivatives of $\tilde{m}(x_{it}, \theta, \alpha_i)$

$$\begin{aligned}
\tilde{m}_\alpha(x_{it}, \theta, \alpha_i) &= \frac{\partial}{\partial \alpha}\tilde{m}(x_{it}, \theta, \alpha_i) \\
\tilde{m}_{\alpha\alpha}(x_{it}, \theta, \alpha_i) &= \frac{\partial}{\partial \alpha}\frac{\partial}{\partial \alpha}\tilde{m}(x_{it}, \theta, \alpha_i)
\end{aligned}$$

List of Household Characteristics [17]

Age Age of the household head

Income Purchasing power parity adjusted household total income

College Dummy variable of being college graduate

Married Dummy variable of being married

Divorced Dummy variable of being divorced

Widowed Dummy variable of being Widowed

Self-Employed Dummy variable of self employed

Retired Dummy variable of being retired [18]

Unemployed Dummy variable of being unemployed

Children under 12 Dummy variable of children younger than 12 in the household

# of Children Number of children for a household

# of Adults Number of adults older than 16 for a household

Homeowner Dummy variable of home ownership

Mortgage Rep. Dummy variable of mortgage repayment

Debt Rep. Dummy variable of Debt repayment

Health Status Number of times the person has been to a doctor or a dentist or optician during the past 12 months (Aggregated)

[17] Make ends meet question is posed at household level and head of the household needs to be defined for the analysis. For my analysis I define: for single household he/she is the head, for multi person household the man who is older than 25 is the head, households with more than one man, who is older than 25, oldest man is the head, household with men younger than 25 years old, woman older than 25 is the head, household with all members younger than 25 years old, man is defined as the head, household with all members younger than 25 with more than one man, the oldest is defined as the head and household with all members females and younger than 25 years old, the oldest woman is defined as the head.

[18] Total number of retired persons in a given household is derived from retired dummy variable

Model Comparisons

In order to clarify the impact of bias corrections to the estimated marginal effects I present the marginal effects of 3 different estimation routines in Table 8. Model 1 presents the fixed effects probit model with no bias correction, model 2 presents the bias corrected fixed effects probit model without the inclusion of bandwidth parameter and model 3 presents the bias corrected fixed effects probit model where bandwidth parameter is applied to spectral expectation. There are remarkable differences in lagged dependent variables across 3 estimation routines. These differences are from changes in sign or significance of regressors to the changes in magnitudes. Among all my specifications I employed a full set of regressors as well as time fixed effects. For the sake of brevity, the estimation results are reported for lagged dependent variable, continuous income in logs variable and unemployment dummy variable, nevertheless, the full set of estimates are available upon request.

To start with, there is little difference between estimated marginal effects of income and unemployment variables in terms of signs and magnitudes of regressors. The marginal effect of income variable remains almost the same among all countries and models. The unemployment dummy on the other hand decreases 1% when it comes to Model 3. These results are not unanticipated and are demonstrated by the simulation studies of Fernandez-Val (2009) and Hahn and Newey (2004) in which uncorrected marginal effects are reasonably close to their true values. The main contribution of the bias corrections for these variables is to correct index coefficients.

The crucial impact of the bias corrections is on the lagged dependent variable. For model comparisons I have employed individual mean definition and observe three types of improvement among models. First of all at Belgium the coefficient of the lagged dependent variable is insignificant for Model 1 and 2. For this country the inclusion of bandwidth parameter changes the results from insignificant to positively significant. At the UK and Denmark, for Model 1 and 2, I observe positive coefficients, which are not

strictly significant with low magnitudes. For these 2 countries bias corrections together with bandwidth parameters increase significance and magnitude of the coefficients. At France and Spain for Model 1 and 2 there is a serious downward bias with significant negative coefficients. Although Model 2 induces bias corrections, it is seen that without the inclusion of bandwidth parameter the bias corrections can not efficiently correct the downward bias. Finally for Italy, Portugal and Greece Model 1 and Model 2 produce positive significant estimates however the magnitudes of these estimates are low. The inclusion of bandwidth parameter increases the magnitudes for these 3 countries.

Table 8: Model Comparisons

	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
		UK			**BE**	
$\mathbf{MeM_{t-1}}$	0.018**	0.018**	0.171***	0.005	0.005	0.158***
	(2.176)	(2.134)	(19.294)	(0.449)	(0.442)	(14.280)
Income	0.103***	0.101***	0.095***	0.116***	0.114***	0.113***
	(11.089)	(10.456)	(9.684)	(6.000)	(5.961)	(5.946)
Unemployed	-0.279***	-0.271***	-0.275***	-0.153***	-0.150***	-0.140***
	(-9.004)	(-8.945)	(-9.240)	(-3.656)	(-3.595)	(-3.412)
		DK			**FR**	
$\mathbf{MeM_{t-1}}$	0.023**	0.023**	0.175***	-0.023***	-0.023***	0.129***
	(2.128)	(2.095)	(17.307)	(-2.970)	(-2.909)	(17.743)
Income	0.139***	0.137***	0.131***	0.100***	0.098***	0.095***
	(6.261)	(6.184)	(6.037)	(8.193)	(8.108)	(7.823)
Unemployed	-0.216***	-0.212***	-0.207***	-0.204***	-0.201***	-0.199***
	(-6.673)	(-6.553)	(-6.525)	(-8.176)	(-8.036)	(-8.036)
		IT			**SP**	
$\mathbf{MeM_{t-1}}$	0.035***	0.034***	0.188***	-0.067***	-0.066***	0.086***
	(4.633)	(4.532)	(24.202)	(-8.296)	(-8.128)	(11.153)
Income	0.079***	0.077***	0.075***	0.090***	0.088***	0.086***
	(7.727)	(7.704)	(7.714)	(10.743)	(10.497)	(10.365)
Unemployed	-0.134***	-0.131***	-0.128***	-0.165***	-0.163***	-0.162***
	(-4.729)	(-4.614)	(-4.575)	(-8.881)	(-8.693)	(-8.677)
		PT			**GR**	
$\mathbf{MeM_{t-1}}$	0.102***	0.100***	0.251***	0.069***	0.068***	0.219***
	(12.377)	(12.007)	(35.147)	(8.002)	(7.836)	(25.260)
Income	0.107***	0.104***	0.097***	0.145***	0.142***	0.141***
	(9.424)	(9.229)	(8.777)	(10.555)	(10.585)	(10.726)
Unemployed	-0.162***	-0.158***	-0.153***	-0.156***	-0.153***	-0.160***
	(-5.325)	(-5.199)	(-5.185)	(-4.639)	(-4.544)	(-4.875)

Note: This table presents the model comparisons among three different models. Model 1 presents the fixed effects probit model with no bias correction, model 2 presents the bias corrected fixed effects probit model without the inclusion of bandwidth parameter and model 3 presents the bias corrected fixed effects probit model where bandwidth parameter is applied to expected terms. For all regressions full set regressors are applied but only three regressors are reported. Income variable is in logs. In parenthesis are t-statistics. All specifications include time dummies. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.10$.