

## IS PERCEIVED FINANCIAL INADEQUACY PERSISTENT?

BY ORCUN KAYA\*

*Goethe University, Frankfurt*

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 covering eight countries over the period from 1994 to 2001, this study applies a dynamic probit model that incorporates both state dependency and individual fixed effects. Exploiting a latterly enhanced bias-corrected fixed-effects probit model, I address the persistent nature of subjective financial inadequacy by directly estimating fixed effects while 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. However, by controlling for household heterogeneity, income, indebtedness, and health status, I find 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.

**JEL Codes:** D31, I32

**Keywords:** dynamic probit model with fixed effects, financial well-being

### 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 financial inadequacy as a monetary rationale, whereas others consider it to be a subjective perception. In addition to the absence of a globally accepted measurement method, the definition of the conceptualization of financial inadequacy varies among different countries.

Defining the main causes of financial inconveniences or 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

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\*Correspondence to: Orcun Kaya, Deutsche Bank Research, Banking, Financial Markets and Regulation, Taunusanlage 12, 60325, Frankfurt, Germany (orcun.kaya@db.com).

Europeans reports that her household has not had a sufficient amount of money to pay ordinary bills or buy food or other daily consumer items on at least one occasion during the past year. In addition, nearly two-thirds of Europeans expect the financial situation of their households to remain unchanged over the next 12 months. In general, despite the financial difficulties that households face, they tend to report that their financial situations remain unchanged. This finding may indicate persistence in household perceptions regarding financial situations, such that financially adequate or inadequate households perceive that they will be persistently financially adequate or inadequate, respectively.

Therefore, the purpose of this paper is to present the findings of an exploratory study that is designed to review the determinants of financial inadequacy by focusing primarily on the persistent nature of this concept. To achieve this aim, I exploit the recently enhanced non-linear panel data model by Fernandez-Val (2009), which enables state dependency to be embedded into a panel probit model while controlling for time-invariant unobserved heterogeneity (fixed effects). By 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, no restrictions are imposed on the initial values of the process; consequently, the initial conditions problem is prevented. Moreover, by controlling for time-invariant unobserved heterogeneity, I am able to distinguish between true (the effect of the lagged dependent variable on the dependent variable) and spurious state dependency.

An alternative to traditional minimum income levels in defining financial inadequacy involves exploiting subjective responses to perceived income surveys, which are capable of controlling for both the income and expenditure sides of household finances. For this purpose, a household's perceived ability to make ends meet, which is observable on an ordinal scale, can be employed as a measure of perceived financial inadequacy.<sup>1</sup> The ability to make ends meet refers to the capability of households to survive financially and is related to many household financial characteristics, such as the ability to maintain financial commitments, attitudes toward savings, the possibility of having no remaining money before the next pay day, and a household's previous financial difficulties. Given this reasoning, perceived ability to make ends meet based on responses at the household level is employed in this paper as a proxy for perceived financial inadequacy.

The first contribution of this paper is to model perceived financial inadequacy in a dynamic model setting. In my analysis, particular emphasis is placed on the extent to which the state dependency of making-ends-meet responses has an influence on the current period's ability to make ends meet beyond the role of factors that the existing literature has already identified. The dynamic nature of the modeling scheme provides insight into the inertia of perceptions, which is related to the adjustment speed of financial inadequacy (Newman *et al.*, 2008; Pudney, 2008). In the limited previous literature, it is assumed that unobservable individual effects are uncorrelated with the explanatory variables, but this assumption is

<sup>1</sup>For the remainder of this paper, the term "ability to make ends meet" is used to address the perceived ability to make ends meet.

problematic for at least two reasons. First, the assumption regarding the independence of the regressors and household-specific effects, as in the random-effects model, is strong for applications in which self-reported responses are utilized as dependent variables. Second, this assumption leads to an initial conditions problem for dynamic models, given that the start of the observation period does not coincide with the true beginning of the process. Consequently, the estimated coefficients are inconsistent, as the process has already been in operation, and are not exogenous to the data-generating process. The initial conditions problem leads to inflated parameters of the lagged dependent variable and generates spurious state dependency. By employing the corrections from Fernandez-Val (2009) and directly estimating the unobserved effects and the consistent model parameters, I avoid the strict exogeneity assumption and, consequently, the initial conditions problem.

The influence of unobservable effects that are individual-specific and constant over time should be considered when modeling self-reported responses (Ferrer-i-Carbonell and Frijters, 2004). Nevertheless, it is difficult to estimate the constant unobservable effects in dynamic non-linear models because of the incidental parameters problem. As a result of a small number of waves in panel surveys, individual-specific effects cannot be estimated appropriately, and the real effects of explanatory variables (marginal effects) cannot be computed. The second contribution of this paper is to compute bias-corrected marginal effects. In calculating these effects, I am able to address the real influence of a change in household characteristics on financial inadequacy rather than addressing only the direction of this effect.

In addressing the impact of household characteristics on financial inadequacy, using aggregate data across different countries can be misleading because household characteristics in different countries may differ in a manner that could be difficult to capture solely through country fixed effects. Moreover, different institutions and regulations in different countries may have distinctive effects on 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 the ability to make ends meet individually across eight different European countries.

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

## 2. BACKGROUND

The traditional method of interpreting financial difficulties involves determining specific income levels (typically known as poverty lines), such that households with incomes below specific poverty lines are defined as poor or financially

inadequate. In this context, several threshold values, such as 60 percent of the national median equivalized income, are suggested to define poverty lines.

However, financial inadequacy is a sophisticated concept that cannot be explained solely in terms of specific income levels. For instance, significant price differences between cities and rural areas increase the difficulty of establishing a global income level that applies to all households. In addition to price heterogeneity, it is now accepted that some households are able to spend their incomes more efficiently than others (Townsend, 1979). Moreover, allocating time between consumption and leisure is a voluntary decision, and individuals choose how much they want to work (Sen, 1985). This choice indeed determines the income that a household will receive; thus, household income is an endogenous decision. All of these factors are somewhat independent from one another and difficult to control based on specific poverty lines. Contrary to specific income levels, subjective measures of financial inadequacy, which consist of households' own judgments of their financial situations, assign more weight to the endogenous choice of household spending. These measures have the advantage of accounting for aspects of household financial situations that are difficult to measure through the income-based approach alone.

The use of subjective indicators as proxy measures of individual utility in analyzing individual preferences, welfare and poverty is now prevalent in the economics literature (Ng, 1997; Frey and Stutzer, 2000; Di Tella *et al.*, 2001; Ferrer-i-Carbonell and Van Praag, 2003; Van Praag *et al.*, 2003). A straightforward implementation for analyzing household perceptions of financial difficulties involves asking respondents about their ability to make ends meet. Danziger (1984) and De Vos Garner (1991) adapt this type of method, which employs the subjective minimum monthly income that is necessary to make ends meet, to gain insights into the perception of financial difficulties. A more recent alternative method by Litwin and Sapir (2009) involves directly utilizing ordinal responses pertaining to the ability to make ends meet as the variable of interest.

Although there have been a number of studies on the subjective indicators and econometric methods that are used in this area, much of the literature on subjective well-being exploits static models. Because it is difficult to model subjective well-being in a dynamic model setting that controls for individual-specific effects, the state dependency of subjective perceptions or the type of dynamic analysis that is most appropriate for the evolution of attitudes and perceptions over time has 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. Pudney (2008) addresses the dynamic nature of financial well-being using a simulated maximum likelihood method. Newman *et al.* (2008) concentrate on a dynamic ordered probit model that incorporates the reference group income effect and the dynamics of financial satisfaction. In a more recent work, Pudney (2011) shows that perceptions of current financial well-being require time to fully adjust to changed circumstances. Using the German Socio-Economic Panel Study, D'Ambrosio and Firck (2012) focus on satisfaction with life and income depending on absolute and relative levels of income in a dynamic framework.

In addition to its dynamic nature, other causes of financial inadequacy can be grouped into two categories: factors that can be controlled by households, and factors that are beyond the control of households. For example, poor budgeting, mismanagement of money (Berthoud and Kempson, 1992; Elliott, 2005), or unwillingness to pay debts (Dominy and Kempson, 2003) can be regarded as behavioral causes that are the consequences of a lack of personal responsibility. Moreover, a number of potential drawbacks 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 subjective responses. It is difficult to control for such behavioral characteristics and biases using standard regressors. However, these types of behavioral differences or deviations can be captured by using the panel dimension of the data and controlling for unobserved household heterogeneity. In particular, fixed effect methods can be employed to capture the household-specific differences that are constant over time.

However, financial difficulties often have causes that are not behavioral and are beyond the control of households. Litwin and Sapir (2009) emphasize that being unemployed or retired is associated with perceived financial difficulty. Controlling for individual-specific fixed effects, Winkelmann and Winkelmann (1998) show that unemployment has a strongly detrimental effect on life satisfaction. Kassenboehmer and Haisken-DeNew (2009) identify the importance of different causes of unemployment (e.g., voluntary, forced) to life satisfaction, whereas Clark (2006) illustrates the negative effect of unemployment duration on the well-being of households. All of these studies find that in addition to the negative income effect on life satisfaction, a decrease in life satisfaction occurs when one becomes unemployed.

Another external factor that may exhaust an important portion of household income is the heavy use of credit and overborrowing. According to Draut and Silva (2003), to cope with the combined financial pressures of rising costs and stagnant or declining incomes, households are assuming increasing amounts of debt by draining their home equity and are reporting record levels of credit card debt. In addition to employment- and debt-related indicators, the standard demographics of households also play a role in perceived financial inadequacy. Along with household income, Stoller and Stoller (2003) identify health status and age as the main predictors of perceived financial inadequacy. Moreover, Lanjouw and Ravallion (1995) illustrate the effect of household size for developing countries.

### 3. ECONOMETRIC FRAMEWORK

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

Although ordinal modeling, such as in ordered probit or logit models, is commonly used in economic studies, Ferrer-i-Carbonell and Frijters (2004) show that employing individual-specific effects that are constant over time is more important than the definition of the dependent variable. Because ordered models

do not allow for the inclusion of fixed effects,<sup>2</sup> I recode the provided responses on an ordinal scale as binary responses. The method that is used in this paper involves recoding the ordinal scale responses of households, such that a value of one is assigned above a certain threshold and zero otherwise (Winkelmann and Winkelmann, 1998; Clark, 2003).<sup>3</sup>

I employ two different threshold values for the binary recoding. The first cut-off is the country average of the household responses regarding the ability to make ends meet. If, for a given household, the ability to make ends meet exceeds the country average, then a value of one is assigned to this household and zero otherwise. Using this recoding method, the dependent variable for household  $i$  at time  $t$  in country  $c$  is defined as follows:

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

The drawback of using country thresholds as cut-off points is that the variations that always occur below or above this specific threshold are overlooked. For instance, during the observation period, a household may always report difficulty in its ability to make ends meet with different difficulty levels (i.e., with great difficulty or with difficulty). If the country average is at the third response level (one can make ends meet with some difficulty), then its responses will always be recoded as zero despite the variation in the responses of this particular household. A similar problem may also arise for the responses that vary but are constantly above the country threshold and therefore recoded as one.

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 period), then a value of one is assigned to this household and zero otherwise. Using the approach above, the dependent variable for household  $i$  at time  $t$  in country  $c$  is recoded as follows:

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

Using the individual thresholds as cut-off points allows for the observation of transitions at lower and higher response levels and addresses personality traits in a more satisfactory manner.

<sup>2</sup>Some studies attempt to develop bias corrections for ordered models as well (Carro and Traferri, 2009). Nevertheless, such corrections are inconvenient for applications with large samples (such as this paper) due to matrix inversion and convergence problems.

<sup>3</sup>Das and Van Soest (1999) develop an estimator that 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 because it uses a standard fixed-effects logit model to maintain the consistency of the estimates. Moreover, in many applications, there is insufficient information for each ordinal category, which is crucial for the computation of a weighting matrix to combine single binary estimates.

For both of the binary dependent variables, a dynamic probit model with fixed effects is estimated separately as in equation (1):

$$(1) \quad Y_{itc} = 1\{\gamma Y_{it-1c} + \theta X'_{itc} + \alpha_{ic} - \varepsilon_{itc}\}.$$

$Y_{itc}$  represents the binary outcome of household  $i$  at time  $t$  in country  $c$ ,  $Y_{it-1c}$  is the lagged binary variable,  $X'_{itc}$  represents exogenous regressors,  $\alpha_{ic}$  represents fixed effects, and  $\varepsilon_{itc}$  is the normally distributed independent and identical error term.

#### 4. DATA AND DESCRIPTIVE STATISTICS

European Community Household Panel (ECHP) data<sup>4</sup> are employed for the analysis in this paper. The ECHP survey was conducted annually across EU member states over the period from 1994 to 2001. In the ECHP, in addition to information on employment, health status, and social background at the 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 to enable cross-nationality comparisons. In my analysis, individuals who are present in all eight consecutive waves are included. Depending on the country, sample sizes range from 3500 to 11,319 for the household level and from 6790 to 17,010 for the individual level analysis.

One of the main strengths of the ECHP data is that they contain subjective questions at the household and individual levels that reflect household opinions regarding current financial well-being. The dependent variable in this paper is derived from household-level subjective questions regarding the financial situations of households, and the head of each household must be defined for the analysis.<sup>5</sup>

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 your household able to make ends meet?”

The responses have been recoded as follows: 1 = “with great difficulty”; 2 = “with difficulty”; 3 = “with some difficulty”; 4 = “fairly easily”; 5 = “easily”; and 6 = “very easily.”

To analyze this subjective question, I make the following assumptions: (i) households are able to evaluate their ability to make ends meet; (ii) there is a positive monotonic relationship between the answers and household perceptions

<sup>4</sup>For the U.K., I employ the British Household Panel Survey because the ECHP was conducted in this country for only three periods.

<sup>5</sup>For my analysis, the following assumptions apply: for single-person households, the individual is the head; for multi-person households, a man older than 25 is the head; for households with more than one man who is older than 25, the oldest man is the head; for households with men younger than 25 years, a woman older than 25 is the head; for households with all members younger than 25 years, a man is defined as the head; for households with all members younger than 25 and with more than one man, the oldest man is defined as the head; and for households whose members are all female and younger than 25, the oldest woman is the head.

TABLE 1  
DESCRIPTIVE OVERVIEW OF MAKING ENDS MEET RESPONSES

|                     | With Great<br>Difficulty | With<br>Difficulty | With Some<br>Difficulty | Fairly<br>Easily | Easily | Very<br>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           |
| Average             | 9.01                     | 14.68              | 29.22                   | 29.67            | 14.98  | 2.79           |

*Notes:* This table presents the percentages of household responses for different categories of the making-ends-meet question. The time span is from 1994 to 2001 and is a balanced panel. In the BHPS, the making-ends-meet question is answered on a scale ranging from 1 to 5 rather than a scale ranging from 1 to 6.

of financial inadequacy; and (iii) the responses are comparable across households in a given country. Vignettes could be employed to provide insight into the cross-country differences of subjective measures; however, the ECHP does not address vignettes. For this reason, I also assume that (iv) responses are comparable across different countries.

Table 1 presents the percentages of household responses for different categories of the making-ends-meet question. The average of the responses for the “great difficulty” category is 9.01 percent, whereas at the other extreme, the fraction is 2.79 percent. The UK<sup>6</sup> has the lowest percentage of households that report having great difficulty, followed by Belgium. Furthermore, the responses in the difficulty category are the lowest in the U.K. among the eight countries. In Denmark and France, approximately 5 percent of households have great difficulty making ends meet. Italy, Spain, Portugal, and Greece have the highest group of households that report having great difficulty making ends meet. In Portugal and Greece, 15–20 percent of households report having great difficulty. Furthermore, the results indicate that in southern countries, such as France, Italy, Spain, Portugal, and Greece, responses are low compared with those in the U.K., Belgium, and Denmark.

For the analysis of this paper, I identify 16 household characteristics that can serve as determinants for the making-ends-meet responses. Apart from the sensitivity analysis with financial satisfaction, all household characteristics, such as age, education, and marital status, refer to the head of the household. Household income which is adjusted for purchasing power parity and comparable across countries and household demographics, including age, education, marital and employment status, are specified as major indicators. Two variables are utilized to address household size: the number of children, and the number of adults in a given household. The presence of children younger than 12 years old in a given household is included as a dummy variable in the regressions. Finally, variables that refer to

<sup>6</sup>In the BHPS, the making-ends-meet question is answered on a scale ranging from 1 to 5 rather than a scale ranging from 1 to 6.



mortgage or any other type of debt repayments and home ownership are employed to represent the current household indebtedness and portfolio situation.

Summary statistics of the variables for household heads are presented in Table E1 in the online Appendix. The average age of household heads in all countries is approximately 45, whereas the incomes adjusted for purchasing power parity range from 16,000 to 25,000. Percentages of college graduates are low in Italy and Greece compared with the U.K., Belgium, and Denmark. Married couples are more numerous in southern countries, where divorce rates are low. Both employment status and various components of household size are approximately the same among all countries with the exception of self-employment rates, which are slightly higher in southern countries. Home ownership rates are high in Spain, Greece, Italy, and the U.K., whereas mortgage and debt repayment rates are low for these countries, except in the U.K. In these countries, households appear to finance their home purchases through resources other than mortgages (i.e., family transfers and passing of property from generation to generation). Finally, the number of times that each household head has visited a doctor during the last 12 months (which is an indicator of household health) is similar for all countries at approximately three times per year.

## 5. EMPIRICAL RESULTS

This section presents the key findings of the paper. The first subsection concentrates on the marginal effects of the lagged dependent variable in different countries. The second subsection examines the influence of various household characteristics on perceived financial inadequacy. The final subsection focuses on sub-group differences.

### 5.1. *Persistence*

An important contribution of this paper is to illustrate the subjective responses pertaining to the ability to make ends meet as a dynamic process while controlling for individual fixed effects. In Tables 2 and 3,  $MeM_{t-1}$  presents the marginal effect of the lagged dependent variable.<sup>7</sup> For both specifications, the lagged latent variable has a positive and statistically significant effect in all countries. The smallest positive marginal effects are observed for Spain. After Spain, the U.K. and France have the smallest effects for the country and individual mean definitions, respectively. Greece and Portugal exhibit the highest positive effects, followed by Italy. Belgium and Denmark exhibit lower marginal effects in varying order depending on the definition of the dependent variable.

Pudney (2008) relates the dynamic nature of perceptions to inertia, such that a greater marginal effect of the lagged dependent variable implies greater inertia 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 greater inertia. Spain, the U.K. and France exhibit low inertia rates; thus, households in these countries appear to adjust to changing

<sup>7</sup>The country mean is rounded to the next integer for the U.K. only, as the U.K. has a scale of 1–5 rather than 1–6 for making-ends-meet responses.

TABLE 2  
MARGINAL EFFECTS USING COUNTRY AVERAGES

|                    | UK                    | BE                    | DK                    | FR                    | IT                    | SP                    | PT                    | GR                    |
|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| MeM <sub>t-1</sub> | 0.130***<br>(9.672)   | 0.157***<br>(6.106)   | 0.165***<br>(7.790)   | 0.143***<br>(14.180)  | 0.164***<br>(17.129)  | 0.065***<br>(6.420)   | 0.220***<br>(13.979)  | 0.201***<br>(22.527)  |
| Age                | 0.005**<br>(2.046)    | 0.007*<br>(1.824)     | -0.001<br>(-0.264)    | 0.004<br>(1.585)      | -0.004*<br>(-1.866)   | 0.001<br>(0.276)      | -0.002<br>(-1.045)    | 0.002<br>(0.744)      |
| Income             | 0.115***<br>(5.177)   | 0.113***<br>(7.299)   | 0.104***<br>(6.459)   | 0.115***<br>(10.031)  | 0.091***<br>(7.317)   | 0.132***<br>(7.988)   | 0.111***<br>(12.926)  | 0.144***<br>(11.508)  |
| High sch.          | 0.017<br>(0.738)      | 0.031<br>(1.167)      | 0.019<br>(0.519)      | -0.009<br>(-0.561)    | 0.016<br>(0.733)      | 0.011<br>(0.505)      | -0.123***<br>(-2.996) | 0.052**<br>(2.326)    |
| College            | 0.017<br>(0.703)      | 0.027<br>(0.622)      | 0.061<br>(1.571)      | 0.010<br>(0.284)      | 0.043<br>(0.610)      | 0.037<br>(1.256)      | 0.005<br>(0.044)      | 0.041<br>(1.175)      |
| Married            | 0.012<br>(0.330)      | -0.110<br>(-1.342)    | 0.012<br>(0.304)      | 0.059<br>(1.419)      | 0.097<br>(1.498)      | 0.056<br>(0.917)      | 0.024<br>(0.505)      | -0.027<br>(-0.387)    |
| Divorced           | -0.091**<br>(-1.977)  | -0.243***<br>(-2.812) | -0.057<br>(-1.198)    | -0.098*<br>(-1.923)   | -0.234***<br>(-2.694) | -0.097<br>(-1.306)    | -0.071<br>(-1.132)    | -0.003<br>(-0.026)    |
| Widowed            | 0.034<br>(0.491)      | -0.276**<br>(-2.528)  | -0.050<br>(-0.567)    | -0.009<br>(-0.135)    | 0.015<br>(0.201)      | 0.026<br>(0.355)      | -0.032<br>(-0.556)    | -0.043<br>(-0.559)    |
| Self-empl.         | 0.042*<br>(1.646)     | -0.013<br>(-0.191)    | -0.030<br>(-0.585)    | 0.057<br>(1.373)      | 0.039<br>(1.549)      | 0.081***<br>(3.113)   | 0.045<br>(1.735)      | 0.075***<br>(3.092)   |
| Retired            | 0.023<br>(0.499)      | -0.189**<br>(-2.037)  | 0.008<br>(0.110)      | -0.020<br>(-0.417)    | 0.017<br>(-0.463)     | 0.006<br>(-1.260)     | 0.035<br>(0.868)      | 0.041<br>(1.012)      |
| Unemployed         | -0.163***<br>(-3.678) | -0.271***<br>(-4.417) | -0.231***<br>(-5.296) | -0.199***<br>(-6.211) | -0.151***<br>(-3.748) | -0.164***<br>(-6.434) | -0.160***<br>(-4.391) | -0.165***<br>(-4.122) |
| #Retired           | -0.061*<br>(-1.833)   | 0.046<br>(0.633)      | -0.028<br>(-0.536)    | -0.006<br>(-0.172)    | 0.028<br>(0.984)      | 0.043<br>(1.006)      | -0.032<br>(-1.109)    | -0.007<br>(-0.233)    |
| Child < 12         | -0.051**<br>(-2.100)  | 0.030<br>(1.154)      | 0.046<br>(1.416)      | -0.034<br>(-1.320)    | 0.000<br>(0.012)      | -0.036<br>(-1.569)    | 0.016<br>(0.698)      | 0.046*<br>(1.879)     |
| #Child             | -0.076***<br>(-4.653) | -0.015<br>(-0.657)    | -0.064***<br>(-3.311) | 0.003<br>(0.197)      | -0.011<br>(-0.721)    | -0.045***<br>(-3.065) | -0.038**<br>(-2.473)  | -0.017<br>(-1.087)    |
| #Adults            | -0.025*<br>(-1.853)   | -0.011<br>(-0.512)    | -0.042*<br>(-1.831)   | -0.022*<br>(-1.793)   | -0.028**<br>(-2.403)  | -0.051***<br>(-4.606) | -0.025**<br>(-2.164)  | -0.015<br>(-1.154)    |
| Homeowner          | 0.168***<br>(4.313)   | 0.081<br>(1.608)      | 0.177***<br>(2.729)   | 0.006<br>(0.197)      | 0.042*<br>(1.698)     | -0.006<br>(-0.219)    | 0.092***<br>(2.957)   | 0.103***<br>(3.788)   |
| Health             | -0.016**<br>(-2.140)  | 0.004<br>(0.484)      | -0.010<br>(-1.243)    | -0.010<br>(-0.585)    | -0.005<br>(-1.284)    | -0.006<br>(-1.325)    | -0.011**<br>(-2.133)  | -0.018***<br>(-3.934) |
| Mortgage           | -0.152***<br>(-5.410) | -0.085**<br>(-2.270)  | -0.152***<br>(-2.580) | -0.085***<br>(-3.824) | -0.112***<br>(-5.592) | -0.084***<br>(-4.730) | -0.139***<br>(-4.633) | -0.072***<br>(-2.891) |
| Debt               | -0.019<br>(-1.473)    | -0.075***<br>(-3.195) | -0.057***<br>(-2.950) | -0.035***<br>(-2.835) | -0.064***<br>(-4.387) | -0.086***<br>(-6.695) | -0.078***<br>(-4.205) | -0.066***<br>(-3.874) |
| Likelihood         | -4.837<br>9,072       | -1.877<br>3,500       | -2.524<br>4,592       | -4.935<br>9,226       | -5.888<br>11,319      | -5.125<br>9,814       | -4.175<br>7,763       | -4.741<br>8,743       |

Notes: This table presents the regression results for the making-ends-meet question. The country specific means are used as cut-off points in order to define the binary dependent variable. Income variable is in logs. t-statistics in parentheses. All specifications include time dummies. \*\*\*p < 0.01; \*\*p < 0.05; \*p < 0.10.

TABLE 3  
MARGINAL EFFECTS USING INDIVIDUAL AVERAGES

|                    | UK                    | BE                    | DK                    | FR                    | IT                    | SP                    | PT                    | GR                    |
|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| MeM <sub>t-1</sub> | 0.170***<br>(19.239)  | 0.158***<br>(14.269)  | 0.175***<br>(17.305)  | 0.129***<br>(17.744)  | 0.188***<br>(24.117)  | 0.086***<br>(11.150)  | 0.250***<br>(35.030)  | 0.218***<br>(25.185)  |
| Age                | 0.004**<br>(2.260)    | 0.004<br>(1.206)      | 0.005**<br>(0.995)    | 0.005**<br>(2.350)    | -0.003<br>(-1.349)    | -0.002<br>(-0.942)    | -0.002<br>(-1.159)    | 0.001<br>(0.340)      |
| Income             | 0.095***<br>(9.640)   | 0.113***<br>(5.943)   | 0.130***<br>(6.028)   | 0.095***<br>(7.826)   | 0.075***<br>(7.713)   | 0.087***<br>(10.370)  | 0.098***<br>(8.825)   | 0.141***<br>(10.724)  |
| High sch.          | 0.045**<br>(2.377)    | 0.011<br>(0.519)      | 0.012<br>(0.445)      | -0.003<br>(-0.201)    | -0.001<br>(-0.048)    | -0.007<br>(-0.375)    | -0.059**<br>(-1.922)  | 0.045**<br>(2.242)    |
| College            | 0.050***<br>(2.597)   | 0.012<br>(0.373)      | 0.031*<br>(0.999)     | 0.051*<br>(1.816)     | 0.002<br>(-0.034)     | 0.004<br>(0.158)      | 0.108*<br>(1.747)     | 0.031<br>(1.028)      |
| Married            | 0.011<br>(0.359)      | -0.031<br>(-0.448)    | 0.026<br>(0.763)      | 0.013<br>(0.370)      | 0.081<br>(1.558)      | 0.164***<br>(3.008)   | 0.043<br>(1.053)      | 0.003<br>(0.056)      |
| Divorced           | -0.071**<br>(-2.051)  | -0.250***<br>(-3.376) | -0.071*<br>(-1.657)   | -0.094**<br>(-2.205)  | -0.103<br>(-1.563)    | 0.056<br>(0.897)      | -0.057<br>(-1.106)    | -0.062<br>(-0.772)    |
| Widowed            | -0.037<br>(-0.638)    | -0.198**<br>(-2.119)  | -0.037<br>(-0.474)    | -0.081<br>(-1.496)    | 0.003<br>(0.055)      | 0.161**<br>(2.499)    | -0.046<br>(-0.941)    | -0.013<br>(-0.184)    |
| Self-empl.         | 0.041*<br>(1.932)     | 0.028<br>(0.569)      | -0.095**<br>(-2.204)  | 0.026<br>(0.718)      | 0.023<br>(1.067)      | 0.029<br>(1.249)      | 0.030<br>(1.372)      | 0.047**<br>(2.165)    |
| Retired            | 0.039<br>(0.886)      | -0.150**<br>(-2.230)  | -0.098*<br>(-1.792)   | -0.051<br>(-1.412)    | 0.026<br>(0.782)      | -0.105**<br>(-2.404)  | 0.043<br>(1.285)      | -0.003<br>(-0.076)    |
| Unemployed         | -0.274***<br>(-9.209) | -0.141***<br>(-3.418) | -0.207***<br>(-6.510) | -0.195***<br>(-8.037) | -0.128***<br>(-4.573) | -0.162***<br>(-8.675) | -0.152***<br>(-5.164) | -0.161***<br>(-4.893) |
| #Retired           | -0.079**<br>(-2.523)  | 0.024<br>(0.472)      | -0.021<br>(-0.549)    | 0.013<br>(0.498)      | -0.018<br>(-0.701)    | 0.084**<br>(2.217)    | -0.021<br>(-0.896)    | 0.038<br>(1.489)      |
| Child < 12         | -0.033*<br>(-1.733)   | 0.018<br>(0.966)      | 0.011<br>(0.389)      | -0.011<br>(-0.556)    | -0.019<br>(-0.967)    | -0.012<br>(-0.624)    | 0.004<br>(1.612)      | 0.001<br>(0.197)      |
| #Child             | -0.071***<br>(-5.782) | -0.039**<br>(-2.232)  | -0.084***<br>(-2.470) | -0.008<br>(-0.721)    | -0.031**<br>(-2.401)  | -0.045***<br>(-3.605) | -0.043***<br>(-3.581) | -0.026*<br>(-1.824)   |
| #Adults            | -0.024**<br>(-2.176)  | -0.022<br>(-1.310)    | -0.039**<br>(-2.470)  | -0.020**<br>(-2.012)  | -0.019<br>(-1.883)    | -0.029***<br>(-3.180) | -0.027***<br>(-2.819) | -0.026**<br>(-2.222)  |
| Homeowner          | 0.093***<br>(3.025)   | 0.050<br>(1.217)      | 0.032<br>(0.710)      | 0.008<br>(0.343)      | 0.045**<br>(2.129)    | 0.030<br>(1.368)      | 0.039<br>(1.520)      | 0.108***<br>(4.289)   |
| Health             | -0.026***<br>(-3.975) | -0.004<br>(-0.636)    | -0.007<br>(-1.050)    | -0.007<br>(-0.343)    | -0.005<br>(-0.144)    | -0.010***<br>(-2.691) | -0.006<br>(-1.319)    | -0.017***<br>(-4.188) |
| Mortgage           | -0.108***<br>(-4.686) | -0.098***<br>(-3.481) | -0.100***<br>(-2.770) | -0.092***<br>(-5.368) | -0.091***<br>(-5.190) | -0.081***<br>(-5.401) | -0.076***<br>(-3.206) | -0.031<br>(-1.394)    |
| Debt               | -0.016<br>(-1.463)    | -0.062***<br>(-3.615) | -0.075***<br>(-4.930) | -0.020**<br>(-2.056)  | -0.060***<br>(-4.782) | -0.095***<br>(-9.011) | -0.080***<br>(-5.478) | -0.082***<br>(-5.362) |
| Likelihood         | -7.870                | -4.103                | -4.648                | -9.270                | -9.494                | -9.106                | -6.941                | -7.387                |
| Sample-size        | 13,797                | 7,000                 | 7,861                 | 16,142                | 16,800                | 15,302                | 12,292                | 12,516                |

Notes: This table presents the regression results for the making-ends-meet question. The individual specific means are used as cut-off points in order to define the binary dependent variable. Income variable is in logs. t-statistics in parentheses. All specifications include time dummies. \*\*\*p < 0.01; \*\*p < 0.05; \*p < 0.10.

conditions more rapidly. In addition to household-specific fixed effects, various household characteristics are controlled for in the regressions. When current household characteristics and household-specific effects are controlled for, the positive significant inertia effects indicate that perceptions of current financial inadequacy require time to fully adjust to changing circumstances. Moreover, the spectrum of the magnitudes of the inertia effects indicates that adjustment rates could vary as a result of country-specific factors.

The marginal effects of the lagged dependent variable are economically highly significant and are thus notable. With the exception of Spain, the effects are constantly above 10 percent and are as high as 20 percent for Greece and Portugal; thus, the results indicate that nearly one-quarter of the perceived ability to make ends meet of Greek and Portuguese households is determined by their previous perceptions. The lagged dependent variable has the largest positive effect among all of the regressors employed, including income. This result implies that in addition to household characteristics, previous perceptions of financial well-being are crucial for current perceptions.

The marginal effects of the lagged dependent variable for Spain are 7 percent and 9 percent for the country and individual mean definitions, respectively. The low inertia rate in Spain is surprising given that Spain (in addition to Portugal and Greece) is considered less generous in covering social risks. European Social Statistics (2002), which use ECHP data and objective income thresholds (60 percent or 70 percent median income level) to define poverty, indicate that Spain has one of the highest exit and re-entry rates (after one year) for households at risk of poverty. In addition to exit and re-entry rates, there is a high rate of temporary employment and, consequently, unemployment turnover in Spain. The percentages of households whose members have ceased employment at their previous jobs or who are unemployed as a result of temporary employment contracts are the highest in Spain among the eight countries. Both of these factors may create adverse effects and lead Spanish households to become accustomed to changes in their financial situations by allowing them to adjust more rapidly to changing economic conditions. By controlling for household-specific effects, this study demonstrates that the true state dependency for Spain is much lower than is generally expected.

Various studies exploiting objective income thresholds (Jarvis and Jenkins, 1998; Jenkins, 2000) document that financial problems or poverty are highly persistent in the U.K. Contrary to objective measures, the smaller marginal effects of the lagged dependent variable (13 percent and 17 percent) in the U.K. demonstrate that U.K. households swiftly adjust their outgoings and are still able to make ends meet. Moreover, the banking system in the U.K. may help in financially turbulent times by allowing households easier access to adjustment channels, such as bank lending and credit card debt. For instance, through easier access to bank credit, U.K. households may resort to bank loans in the event of economic upheavals.

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

also indicates that income inequality in France declined sharply during the 1970s and 1980s and was accompanied by a decrease in the risk of financial inadequacy. As a result of these policies, French households may have shorter-term income-to-need adjustment periods and therefore exhibit less inertia.

In Belgium and Denmark, the marginal effects of the inertia rates range from 15 percent to 17 percent for both dependent variable definitions. European social statistics (2002) document that in Belgium and Denmark, both income poverty and the risk of persistent poverty are low. Moreover, exit rates from poverty are high, whereas re-entry rates are low. Nevertheless, the positive marginal effects of inertia rates reveal that high exit rates from objectively defined poverty statistics or low persistent poverty risks are not directly related to higher adjustment speeds or lower inertia rates for these two countries.

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

## 5.2. *Socio-Economic Factors*

In addition to the lagged dependent variable, Tables 2 and 3 demonstrate the marginal effects of various household characteristics for the present period. For both specifications, the signs and significance of the variables are robust, and the magnitudes of the marginal effects are economically significant. The discussion in this subsection addresses the significant effects for both of the regressions.

Previous studies highlight household income as an important indicator of general and financial well-being as well as the ability to make ends meet (Ferrer-i-Carbonell, 2005; Clark, 2006; Newman *et al.*, 2008). My results are consistent with the previous findings that household income has a positive and significant effect (approximately 10 percent) on the ability to make ends meet for all countries. Marital status in the regressions is addressed by including married, divorced, or widowed statuses; single status is the omitted group. Being married has no significant effect on making ends meet. In contrast, being divorced has a negative effect in the U.K. and Belgium (8 percent and 25 percent marginal effects, respectively). Being widowed is negatively significant only in Belgium. In southern countries such as Italy, Spain, Portugal, and Greece, neither being divorced (with the exception of Italy, which has a negative sign for being divorced for the country mean definition) nor being widowed has a negative influence on current periods of financial inadequacy; this result could be caused by the stronger family ties in southern countries.

Employment status is another important determinant that affects the ability to make ends meet. Kassenboehmer and Haisken-DeNew (2009) highlight the

importance of unemployment on individual well-being, and Litwin and Sapir (2009) assign employment status as the second strongest predictor of the ability to make ends meet. In all countries, being unemployed strongly decreases financial adequacy, with marginal effects ranging from 14 percent to 25 percent. It is noteworthy that unemployment decreases perceived financial adequacy given that income is controlled for. So this is an effect over and above the effect of the loss of income. Nevertheless, the status of being retired and the total number of retirees in a given household appear to have no influence. Only in Belgium does being retired have a negative effect of 20 percent. In southern countries such as Spain, Portugal, and Greece, there is also a positive effect (less than 10 percent) of being self-employed. Other negative indicators include the various components of household size. For instance, with the exceptions of Belgium and Greece, an increase in the number of adults has a 2–5 percent negative effect, whereas an additional child in a given household has a 3–7 percent negative effect. The ages of children do not appear to be significant for any of the countries.

Debt repayment dummies, such as mortgage and other debt repayments, present similar effects in terms of sign and significance. Non-mortgage debt repayments have a negative effect for almost all countries, with marginal effects in the range of 6–10 percent. In Denmark, there is no significant effect of debt repayment. Mortgage debt should be evaluated in combination with home ownership, as such debt pertains to the main property of a household. During adverse economic conditions, in which unemployment rates rise and household assets depreciate in value, households may be unable to pay their loans, which in turn affects their ability to make ends meet. However, the negative effects of mortgage debt may be offset 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 reduces some of the negative effect of mortgage repayment, whereas in the U.K. and Greece, the negative effect of mortgage debt is 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 likelihood of having the ability to make ends meet, with marginal effects of approximately 2 percent. 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. In all regressions, year dummies are included to capture potential business cycle effects. Nevertheless, the year dummies are primarily insignificant. This result could be caused by the stable GDP growth in nearly all European countries from the mid-1990s to 2000.

### 5.3. *Sub-Samples*

Following Blanchflower and Oswald (2004), I divide the sample into different groups and report individual inertia effects for the age and education sub-samples. Column 1 of Table 4 presents the sample whose members are younger than 45 years of age, whereas column 2 presents the sample whose members are older than 45. For all countries other than Italy, younger households appear to adjust more slowly than older households. In their studies, Danziger (1984), and Stoller and Stoller (2003) address the importance of age for making ends meet and report that

TABLE 4  
DIFFERENTIATING BETWEEN SUB-SAMPLES

| MeM <sub>t-1</sub> | Age ≤ 45             | Age > 45             | Non-College          | College             |
|--------------------|----------------------|----------------------|----------------------|---------------------|
| UK                 | 0.186***<br>(13.768) | 0.148***<br>(4.302)  | 0.160***<br>(10.504) | 0.188***<br>(8.780) |
| BE                 | 0.177***<br>(6.870)  | 0.160***<br>(4.223)  | 0.151***<br>(10.301) | 0.139***<br>(6.133) |
| DK                 | 0.174***<br>(11.013) | 0.162***<br>(9.217)  | 0.172***<br>(11.557) | 0.217***<br>(7.510) |
| FR                 | 0.122***<br>(10.406) | 0.114***<br>(9.604)  | 0.127***<br>(15.062) | 0.115***<br>(6.329) |
| IT                 | 0.182***<br>(10.001) | 0.193***<br>(8.137)  | 0.186***<br>(22.481) | 0.189***<br>(4.519) |
| SP                 | 0.102***<br>(7.033)  | 0.083***<br>(7.251)  | 0.085***<br>(9.317)  | 0.083***<br>(3.803) |
| PT                 | 0.266***<br>(17.292) | 0.247***<br>(23.871) | 0.247***<br>(33.285) | 0.217***<br>(4.176) |
| GR                 | 0.240***<br>(13.471) | 0.218***<br>(9.719)  | 0.220***<br>(20.672) | 0.210***<br>(8.354) |

*Notes:* This table presents the regression results for the making-ends-meet question for sub-samples. The individual specific means are used as cut-off points in order to define the binary dependent variable. Income variable is in logs. t-statistics in parentheses. All specifications include time dummies. \*\*\*p < 0.01; \*\*p < 0.05; \*p < 0.10. All regressions are run with full set of regressors. Reported marginal effects are only for lagged dependent variable.

elderly people generally find their income to be adequate, even when those incomes are relatively low. However, most of the differences in the magnitudes of the inertia effects are small. The U.K. is the only country with a significant age effect for the previous regressions, with a 4 percent difference in the lagged dependent variable between younger and older households across the sub-samples.

Columns 3 and 4 of Table 4 present the inertia effects for non-college and college graduates, respectively. Again, the differences are small. Although documented as an important indicator of financial well-being, education has little influence on the dynamics of financial well-being. Only in Denmark is there a 5 percent difference between college and non-college graduates, with non-college graduates appearing to report higher adjustment rates. With regard to the sub-samples, the differences in the lagged dependent variables are negligible; thus, the inertia evidence does not differ between different education levels.<sup>8</sup>

## 6. ROBUSTNESS AND SENSITIVITY ANALYSIS

Table E2 in the online Appendix presents the correlation matrix of various subjective satisfaction questions that were included in the ECHP questionnaire. The highest pairwise correlation for making ends meet is observed for financial

<sup>8</sup>I utilize the Pairwise-Wald test to examine the differences of the lagged dependent variable marginal effects across sub-samples. The test results do not reject the null hypothesis that the differences in lagged dependent variable marginal effects are statistically insignificant.

satisfaction, with a value of 0.61, followed by satisfaction with earnings, with a value of 0.46. Satisfaction with housing or work appears to be correlated to a lesser extent (approximately 0.3), whereas satisfaction with leisure has the lowest correlation coefficient of 0.16. For a sensitivity analysis, I employ financial satisfaction, which is derived from the individual part of the ECHP questionnaire, as the dependent variable and apply the probit model from equation (1). The respondents are asked to report their satisfaction with their financial situation by responding on a scale from 1 to 6, with 1 representing not satisfied and 6 representing fully satisfied. The analysis of financial satisfaction is now conducted at the individual level rather than the head-of-household level. In the regressions, demographics such as age, education, marital or employment status are now individual-specific, whereas factors such as household income and home ownership are at the household level.

Row 1 of Table E3 in the online Appendix presents the marginal effects<sup>9</sup> of the lagged dependent variable for eight EU countries. Consistent with the results from Table 3, Spain has the lowest marginal effect with a value of 7 percent, which suggests a low inertia rate. In contrast, Portugal and Greece exhibit greater inertia, with high marginal effects of 24 and 19 percent respectively. The U.K., Belgium, Denmark, France, and Italy demonstrate positive significant marginal effects (approximately 15 percent) of the lagged dependent variable; thus, the results suggest that financial satisfaction (as making ends meet) is a state-dependent variable for all countries.

With regard to socio-economic factors, income has a positive effect across all countries, whereas the health proxy has a negative effect; this finding is analogous to the previous results. The number of adults and the number of children negatively affect financial satisfaction. Being unemployed causes households to be financially dissatisfied, whereas being retired or self-employed does not have a significant effect on satisfaction. In the U.K., having mortgage debt is associated with lower levels of financial satisfaction with high statistical significance, whereas in the other countries, the marginal effects are again negative but with modest significance. Having non-mortgage debt is also associated with lower levels of financial satisfaction but to a lesser degree compared with the ability to make ends meet. Only in the U.K. and Denmark is the degree of association greater. Finally, home ownership positively affects financial satisfaction with modest statistical significance. The magnitude and sign of the results are consistent with those in Table 3, indicating that previous results are robust to differences in selected dependent variables.

It could be argued that the lagged dependent variable captures shocks to household characteristics that occurred in the past (i.e., an unexpected increase or decrease in previous income). To address this argument, I employ the lags of the regressors ( $X_{t-1}$ ) rather than their current values as a further sensitivity analysis. I perform this new robustness check for both the country and individual mean definitions of the make-ends-meet responses. For the sake of brevity, the estimation results are not reported but are available upon request. I observe that the marginal effects of the lagged dependent variables remain strictly significant and

<sup>9</sup>The dependent variable is recoded using the individual-level mean.



are slightly larger in all countries: the estimated marginal effects increased by 1–2 percent compared with the original results. Moreover, the majority of the regressors (except the lagged dependent variable) became insignificant in this sensitivity check. This result indicates that it is adequate to model the lagged dependent variable with the current household characteristics. As a final sensitivity check, I allow for a higher bandwidth parameter. I observe that choosing a bandwidth parameter of two does not influence the results in terms of the significance and sign of the marginal effects of the model parameters.

## 7. CONCLUSION

In this paper, the determinants of perceived financial inadequacy are analyzed in a dynamic model setting. Self-reported responses pertaining to the ability to make ends meet are utilized as a measure of perceived financial inadequacy, and financial satisfaction is employed as a sensitivity check. Analyses are performed separately for eight European countries using the ECHP survey data.

The specific focus of the paper is on the persistence patterns of perceived financial inadequacy, which are related to the inertia of these perceptions. Previous studies either focus on static models by omitting state dependency or are unable to address the dynamics appropriately because of strict assumptions or econometric obstacles, such as initial conditions problems (Newman *et al.*, 2008; Pudney, 2008). These obstacles lead to inaccurate and possibly spurious estimates of persistence. Moreover, with the imposition of the exogeneity condition, it is not possible to make predictions on expected changes when particular household characteristics are changed on an individual basis. By obtaining bias-corrected model coefficients and observing marginal effects, I overcome the econometric obstacles and restrictive assumptions encountered in the previous literature. Thus, this paper is the first attempt to estimate the state dependency of perceived financial inadequacy and household heterogeneity simultaneously by treating time-invariant household heterogeneity as parameters to be estimated. Because time-invariant household heterogeneity is controlled by household-specific constant terms, marginal effects for the model parameters, including the true state dependency, can be computed in my analysis. Thus, the influence of changes in particular household characteristics on perceived financial inadequacy can be addressed explicitly.

My results reveal that current perceptions of financial inadequacy are determined by perceptions of past financial inadequacy over and above the current household characteristics. Moreover, a country-by-country analysis shows that European households are far from being identical in terms of their inertia levels. As a result of country-specific factors, inertia rates differ between countries. There is a spectrum of results ranging from low (Spain, U.K., and France) to moderate (Belgium and Denmark) and high (Italy, Greece, and Portugal) inertia levels of European households. Consistent with the previous literature, income and home ownership positively affect current perceived financial inadequacy, whereas unemployment, indebtedness, and the number of household members have negative effects.

In conclusion, the persistence of financial inadequacy shows that a household's own history of perceptions is relevant to its current perceptions. This finding has relevant policy implications. A society in which the majority of households persistently feels financially inadequate may prompt demand for income redistribution. In other words, there could be a reverse tunnel effect in which households will be more inclined to object to income inequality if they perceive that their financial well-being is persistently inadequate.

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## SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

**Appendix A:** Dynamic Probit Model with Fixed Effects

**Appendix B:** Derivations

**Appendix C:** Model Comparisons

**Table C1:** Model Comparisons

**Appendix D:** List of Household Characteristics

**Appendix E:** Tables

**Table E1:** Summary Statistics of Variables

**Table E2:** Correlation Matrix of Satisfaction Responses

**Table E3:** Marginal Effects for Financial Satisfaction using Individual Averages