TILBURG UNIVERSITY
Understanding Society

"Going *Green* on Late Payments"

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ABSTRACT

During the most recent global economic recession there was a marked increase in late payments which motivated energy suppliers, financial lenders, and other service providers to understand the key backgrounds of clients that trigger this lapse in financial payment morale. We investigate the 3rd Wave of the European Quality of Life Survey (2011-2012) to answer the question of why households delay payment of their utility bills and other expense (i.e. rent and consumer or informal loans), particularly as a function of the energy efficiency of the dwelling. Extant literature of resource consumption identifies several main drivers of arrears (delayed payments), including household liquidity, composition, and financial literacy. Our research makes two important contributions to the research on residential energy consumption: First, we find that less energy efficient homes are more likely to fall into utility arrears and other late payments for the household. This is an important contribution given that households may not be aware of the insidious influence that energy inefficiencies of the home can have on their consumption and subsequent financial health. Lastly, our research contributes to literature on consumer well-being in a post-recession context when we find that those who report being satisfied with their accommodation and standard of living are significantly less likely to fall into arrears. These findings again underscore the importance of addressing issues around energy efficiency of residential accommodations, to increase the likelihood of a dwelling the suits the environment and positive household perceptions of well-being.

I. INTRODUCTION

Residential utility bills have gained attention from both sides of the contract lately. Consumers have become more aware that their energy use can be reduced, resulting in valuable financial savings and in meaningful contributions to the ongoing battle with climate change. Energy suppliers, however, faced an increase in late payments during the global financial crisis, and this abnormal incidence motivated these providers to understand the key backgrounds of clients that trigger this lapse in financial payment morale.

All consumers that contract diverse forms of goods, services, or financing share some propensity to be late in their (re)payment. Despite institutional efforts to reform consumers' financial behavior (i.e. mandating late payments fees or providing regular feedback on consumption), arrears are still prevalent, with almost one in four U.S. adults admitting they don't always pay their bills on time (NFCC 2015 Financial Literacy Survey). Given the persistence of this phenomenon over time, we recognize there are clearly a set of factors driving arrears that research has yet to identify and characterize. This paper's aim is to explore the most substantial drivers of arrears, particularly as a function of consumers' background and attitudes towards different key aspects of life as well as structural factors of the dwelling. The background factors we investigate include household income and financial literacy as well as family composition. We employ a four-item scale as a measure of consumer well-being while structural factors center on our key measure: how energy efficient the home is.

A particular form of late payment, utility arears, are driven directly by household knowledge, attitudes, and behavior. Extant literature on energy efficiency has identified many behavioral patterns that drive energy consumption, as well as those factors that subsequently lead to readjusting beliefs and behaviors through learning. This paper extends this research into residential energy efficiency by demonstrating the impact household energy efficiency can have on a household's utility arrears. We explicitly look at how living in an older, less energy efficient dwelling effects financial payment morale in the form of late payments.

First, the drivers of utility arrears are identified in the residential energy literature. We will then operationalize these driving factors in a regression analysis using data from the European Quality of Life Survey. The following sections detail this process further.

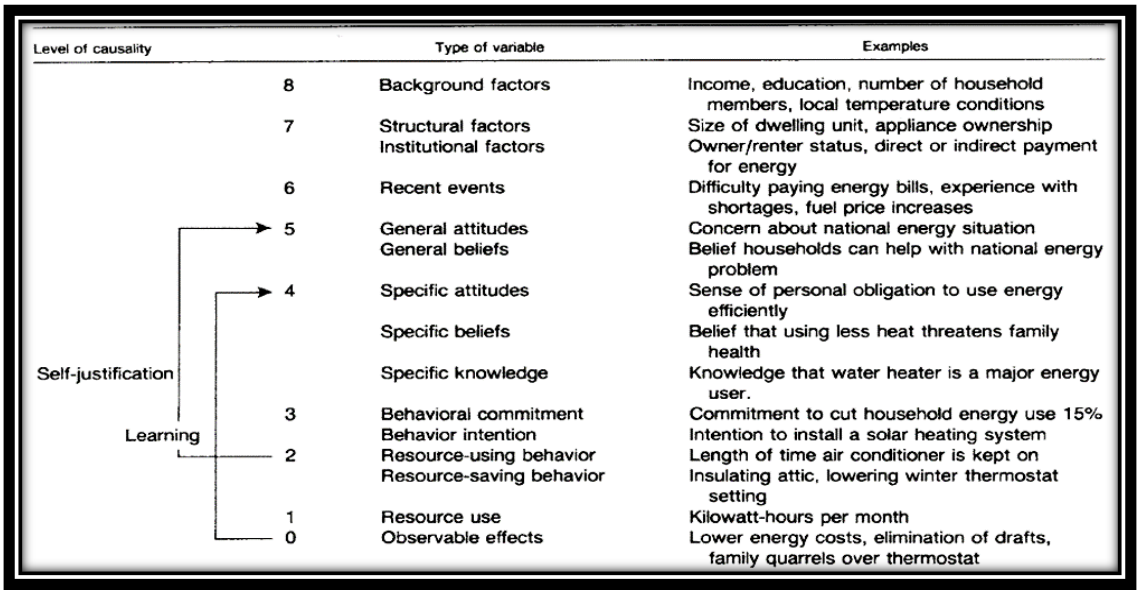
II. LITERATURE REVIEW & THEORETICAL FRAMEWORK

Extant literature on household arrears establishes that both the size and type of a bill affect the probability of an on-time payment, as satisfying larger bills (e.g. unexpected car maintenance, dentist bills) and compulsory fees (e.g. deposits, taxes) generally leads to a less rewarding consumption and greater discomfort than other financial obligations (Silber 2008). Consumers also share a propensity for late payment based on the demographic and economic category into which they fall (Silber 2008; Bridges & Disney 2002; Frankhauser et al. 2008; Pike & Cheng 2001). While somewhat limited, the literature on arrears points to

three main themes that impact consumers' propensity to pay their bills on time: (1) financial liquidity, (2) family composition, (3) age and financial literacy. We further extend the literature into household arrears by contributing the influence of (4) attitudes and beliefs towards the future, and (5) the energy efficiency of the home. Stern and Oskamp's (1987) Causal Model of Resource Use (Figure 1) gives an overview of these key themes.

The model below gives the expected direction of the expected effects. The model shows how background factors like income and the number of household members have the least impact on resource consumption, while specific knowledge (e.g. knowing how much energy different appliances consume or how to budget finances) ultimately has a greater impact on resource consumption. Furthermore, it shows how households that consume at higher rates may incur large bills and consequently have difficulty paying these bills which increases their probability of arrears. Our research tests which background and structural factors, as well as recent events, (i.e. difficulty paying bills) can proficiently predict the incidence of utility arrears.

Figure 1 – An Approximate Causal Model of Resource Use



From "Managing Scarce Environmental Resources" (p. 1063) by P. C. Stern and S. Oskamp, 1987`

The traditional and most intuitive explanation for utility arrears is that consumers do not have enough liquid funds available with which to pay their bills when they are due (Silber, 2008). Given this, Silber (2008) highlights that those in the lower ranks of the economic scale are especially susceptible to arrears, where consumers have payment obligations that exceed their income for months or years at a time. In their empirical analysis of the effect of credit and arrears on household debt in the UK, Bridges & Disney (2002) found that, overall, lower income families were more likely to have arrears. This pattern is seemingly not limited to western societies as having higher income lead to a lower probability of utility arrears in the Ukraine as well (Frankhauser et al. 2008). We use these findings to develop our first hypothesis:

H1: Households with low financial liquidity (i.e. low income) are expected to have higher incidence of arrears.

H2: Households that have experienced recent difficulties paying their bills are expected to have a higher incidence of arrears.

The low liquidity explanation, however, is understood to be inadequate when Silber (2008) concludes that "most [U.S.] consumers other than those on the brink of bankruptcy can access sources of equity with which to pay bills if they are motivated to do so." Building therefore on the low liquidity explanation, the literature posits family composition as one of the main drivers of late payments. Bridges & Disney (2002) found that 40% of low-income single parents paid their utilities late, while 30% of low-income couples were late on their utilities. They also found every extra child raises the average amount of arrears by £57 for couples and £75 for single parents (Bridges & Disney, 2002). This positive association between family size and arrears was mirrored in the Ukraine where Frankhauser et al. (2008) found larger households also had a higher probability of utility arrears. These findings together motivate our second hypothesis:

H3: Households with a more extensive (in-home) family composition are expected to have higher incidence of utility arrears (i.e. individuals and couples are expected to have less incidence than single parents and full families).

Extant literature furthermore points to youth and lack of financial experience as a key determinant of utility arrears. Younger, and less educated individuals are more likely to be in arrears in the UK, as are those in the US (Bridges & Disney 2002; Silber 2008). Empirical studies suggest that younger accountholders are, generally, not prepared for the damaging consequences of arrears, and, even worse, delinquencies, by the time they gain the capacity to contract for goods and services (Silber 2008; Beshears et. al 2007; Agarwal et. al 2006). Furthermore, M. van Rooij et al. (2011) find that financial literacy in the Netherlands is lowest among young individuals, while highest among middle-age persons (particularly 40 to 60), suggesting that people may learn these skills as they age. We develop our third hypothesis here:

H4: Younger heads of households are expected to have higher incidence of utility arrears, driven by low financial literacy and a lack of financial experience.

Given that households are required to have a focus on the future in consideration of expected consumption expenses, orientation toward the future is also a likely key indicator of financial responsibility and propensity for late payment. Future orientation can generally be defined as "the human ability to anticipate future events, give them personal meaning, and to operate with them mentally (Nurmi, 1991, p. 4). As a measure of specific attitudes and behavioral intention, households with greater orientation towards the future are expected to value their future prospects greater and as a result be more financially. Nurmi's (1991) model describes four dimensions of future orientation: detail, optimism, pessimism, and control beliefs. We control for future optimism in our analysis and expect:

H5: Households that demonstrate a greater orientation toward the future (as operationalized by optimism) are expected to have a lower incidence of arrears than those that are less optimistic about their future circumstances.

Lastly, the current research proposes that energy efficiency of the home influences a household's probability of being in utility arrears. Extant literature shows that energy misinformation is quite common, as "householders misjudge the amount of energy used in various home activities, and these errors are resistant to ordinary information campaigns (e.g., Becker, Seligman, & Darley, 1979; Kempton, Harris, Keith, & Weihl, 1985)" (Stern 1992). In this respect energy use is not a behavior but an outcome of behavior based on personal experience and situational factors.

Building on these conjectures, if households have conditions that reflect a less energy efficient dwelling, it's expected that they may not be aware of how these factors augment their energy consumption in addition to their normal home consumption activities. We posit that if respondents have these conditions in their home, then the home is by definition not energy efficient as these conditions allow for wasted energy (through loss of heating and cooling of the home if openings aren't sealed) as well as wasted water (through leaking pipes). Households that report having energy inefficient homes are therefore more likely to be surprised by an unusually large utility bill when planning household expenditures on a fixed income. Moreover, this coincidence between energy inefficiency and utility arrears is expected to be greater in geographic regions that have more severe seasonal fluctuations in weather and environmental conditions. We therefore build on the residential energy efficiency literature in developing the following hypothesis:

H6: Households with energy inefficient homes (i.e. residences with deteriorating structural conditions) are expected to have a higher incidence of arrears than those living in homes that do not have deficiencies in their structure

III. DATA

Data from the European Quality of Life Survey (EQLS) are used to identify the background and attitudinal drivers of utility arrears. The EQLS is conducted by the European Foundation for the Improvement of Living and Working Conditions (Eurofound), to investigate the factors that affect well-being in European society (Eurofound, 2013). The first EQLS was administered in 2003, and the second in 2007, while the third and most recent round was completed in 2011–2012. We use data from the third wave to evaluate the drivers of utility arrears at the end of the recent economic downturn. Our final data set includes 35,516 household observations for the third wave. Twenty-seven European Union Member States are included in the EQLS.[1] The minimum sample size was 1,000 for each country while larger samples were collected from the most populous nations. The interviews for the questionnaire were conducted face-to-face with all eligible respondents being over the age of 18.

[1] A full list of all countries surveyed can be found in the appendix. Seven other European candidate or pre-accession countries are excluded from our analysis.

To test our hypotheses we first include variables to control for the impact of financial liquidity on the incidence of arrears (H1). This hypothesis is examined by two variables measuring: 1) net income of the household (in Euros) and 2) if the household can afford to keep the home adequately warm. A household's experience with recent financial difficulties (H2) is captured by a variable that measures how easy or difficult it is to make ends meet.

To examine family composition (H3), we included variables measuring the number of people living in the household (including children) and also how many rooms the home has. To test how youth and financial literacy may impact the incidence of arrears (H4), we control for the age of the head of household, with the assumption that financial literacy increases with age (Van Rooij, Lusardi, & Alessie 2011).

The influence of future orientation (H5) is operationalized with one variable that measures how optimistic the respondent is toward the future. Energy efficiency of the home (H6) is measured by two proxy variables: one capturing if there is rot in the windows, doors or floors and another measuring if there are damp walls or ceilings due to leaks.

In addition to test variables for our hypotheses, we include several factors measuring well-being in our analysis to understand the impact that different moods and perceptions have on the incidence of arrears. To get a rounded picture of well-being, the EQLS measures the construct in three complementary ways: hedonic, evaluative, and eudaimonic (Eurofound, 2013). Questions from the hedonic scale measure people's day-to-day moods. We focus our research on negative assessments (i.e. I have felt particularly lonely). Evaluative well-being is measured as a function of satisfaction with key aspects of life. We include relevant factors here including respondents' satisfaction with their accommodation and standard of living. Eudaimonic wellbeing questions are designed to gauge information around several other concepts believed to be important to well-being. These items are however used less in the cited research and correlate low to the incidence of arrears; they are therefore excluded from our analysis. Four items from the hedonic and evaluative scales are combined to create an overall well-being scale that is included in the regression analysis. This scale achieves an acceptable level of reliability (α =.78), giving support to its robustness to measure household well-being in the EQLS sample.

We also include control variables for the EU cost-of-living indices, calculated by NUMBEO, a reputable crowd-sourced database of reporting prices, and other consumer statistics. Each country is assigned a cost of living index as a relative indicator of its consumer goods price, including groceries, restaurants, transportation and utilities, all relative to those in New York City (indexed at 100%; NUMBEO, 2016). The Cost of Living Index does not include expenses associated with the accommodation, such as rent or mortgage (NUMBEO 2016). In addition to cost of living, we also control for EU geographical regions in line with the European country split employed by Avdeev et al. (2011).

Table 1 – Summary Statistics

	Count	Mean	SD	Min	Max
Total arrears	35516	.3851504	.9418475	0	4
Utility arrears	35165	.1440353	.3511305	0	1
H1: HH Net Income	8543	12.57298	5.171947	1	22
H1: Keep home warm	35101	.8643628	.3424077	0	1
H2: Make ends meet	35054	3.43045	1.287944	1	6
H3: Full HH size	35516	2.523567	1.321598	1	10
H3: Rooms in home	35234	3.62891	1.571131	1	12
H3: Children	35329	1.587138	1.309801	0	10
H4: Age	35516	3.482121	1.240315	1	5
H5: Optimistic future	35214	2.636963	1.125132	1	5
H6: Rotting windows/floors	35430	.0966977	.2955499	0	1
H6: Damp or leaking walls/ceiling	35437	.1323758	.3389036	0	1
Gender	35516	1.574136	.4944803	0	1
Well-being: Satisfaction accommodation	35419	7.724357	2.083265	1	10
Well-being: Satisfaction Std. of Living	35344	6.853525	2.277241	1	10
Well-being: Happiness	35337	7.331154	1.917996	1	10
Well-being: Lonely	35337	5.072191	1.315462	1	6
Metro/Rural living area	35459	2.634564	.955946	1	4
Cost-of-Living Index	34510	60.54844	15.61458	34.8	84.88
N	35516				

Table 1 shows summary statistics on some key demographic and household variables. The average respondent was 49 years old, representing a mostly older sample with ages ranging from 18 to 95. Women make up 57% of the final sample for the third wave. Given the average age of the sample, the mean net income for households in a given month was between €900 and €1,300.

As a summary measure, we observe the incidence of arrears in the EQLS data. The vast majority of households (81%) do not report having any arrears from rent, utility bills, nor consumer or informal loans. Almost 1 in 10 households report paying these bills late at least once, while less than 5% experienced arrears more than twice. Fourteen percent of households report having utility arrears, suggesting most late payments are of this form.

The EQLS data shows that the incidence of arrears, including those from utility bills, is more frequent among households with less energy efficient homes. Figure 3 illustrates that households that have rotting windows, doors, or floors have a higher incidence of arrears (i.e. those resulting from rent, consumer and informal loans as well as utility bills). Of those homes that have energy inefficient conditions, there are twice as many incidences of utility arrears (as well as arrears from rent and personal loans) when compared to those who do not report having deficient home structures.

Figure 2 – Percentage of HH arrears

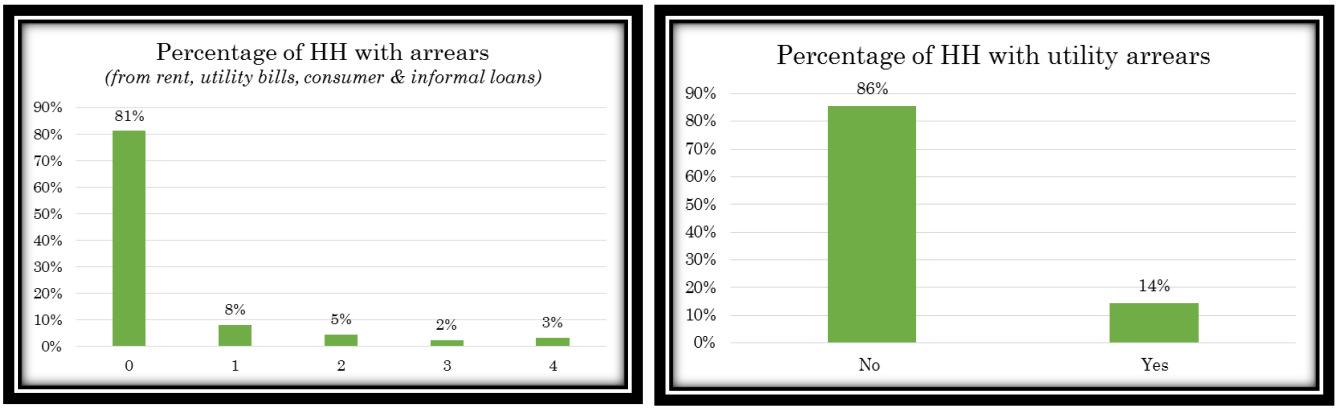
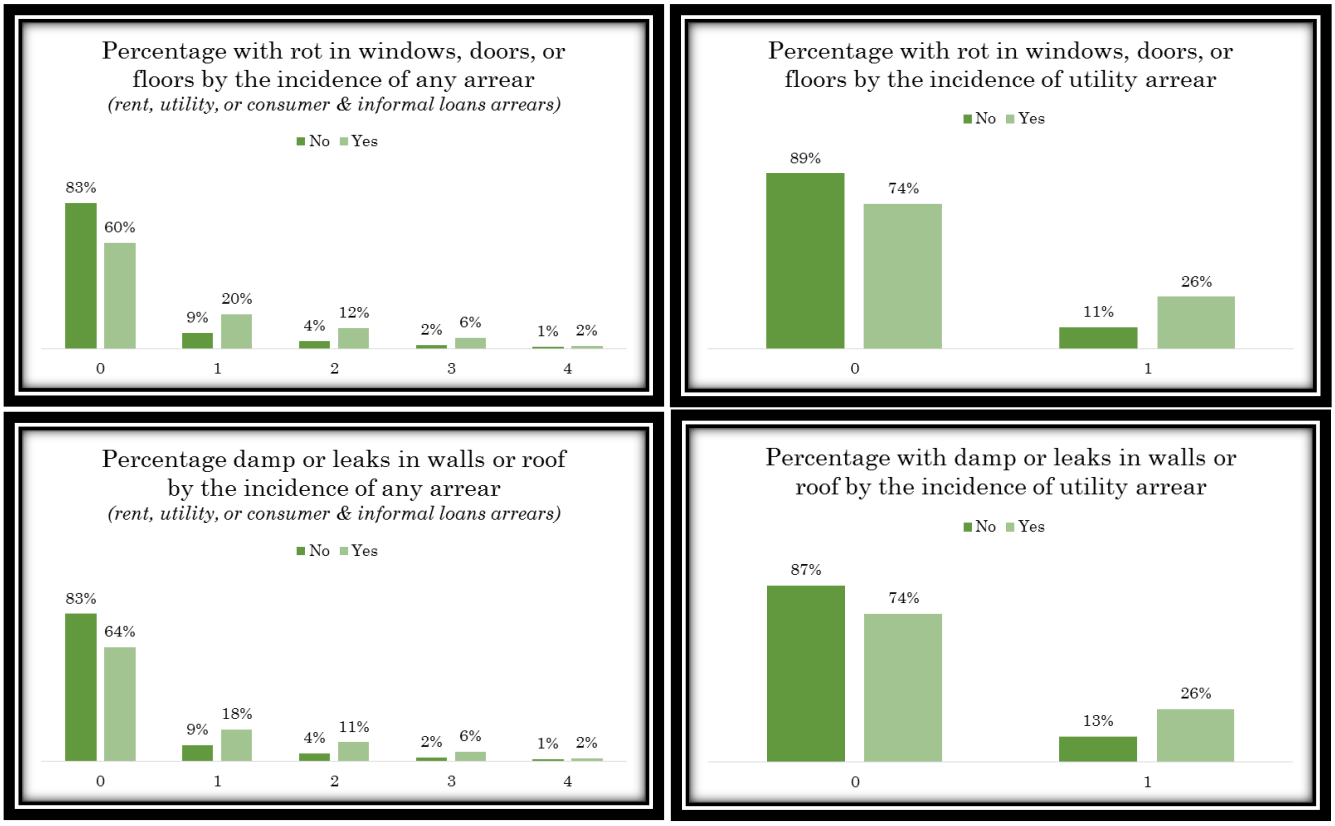


Figure 3 – Energy Efficiency of Homes and Arrears



We further examine the geographical incidence of arrears to find countries in the Central, Eastern, and Southern regions of the EU have the highest incidence of utility arrears. Figure 4 (appendix) illustrates the percentage of respondents that reported paying utility bills late in each EQLS country. The highest incidence of utility arrears is observed in Cypress (26%), Greece (26%), Romania (24%), and Poland (23%). Respondents in

Hungary (21%), Latvia (20%), Italy (19%), and Bulgaria (18%) also report having a somewhat high incidence of utility arrears.

The same trend across EU regions is found when we look at the incidence of arrears in general. Figure 5 (appendix) illustrates the percentage of respondents that reported paying their rent, loans, and utility bills late in each EQLS country. Fifteen percent of respondents in Cypress, Greece, and Lithuania report having at least two arrears. This figure increases to over 20% of respondents in Bulgaria, Latvia, and Romania. Italian respondents report the highest incidence of having at least four arrears from their total household expenses.

Given their notable association with utility and other arrears, it's important to investigate which EU regions are most likely to have homes with energy inefficiencies. Figure 6 (appendix) shows the percentage of respondents that reported having either of the residential energy inefficiency conditions (i.e. rotting windows, doors, or floors; damp/leaking walls or ceiling) in each of the EQLS countries. Here we also observe that those countries in the Central, Eastern, and Southern regions have the highest incidence of homes with energy inefficient conditions. Baltic countries like Latvia (26%; 33%), Estonia (18%; 21%), and Lithuania (17%; 11%) all have notable incidences of energy efficient households, while Mediterranean countries also observe these relatively high incidences, including Cyprus (8%; 29%), Bulgaria (17%; 22%), and Greece (24%; 19%).

IV. RESULTS

The results of our regression analysis confirm virtually all our hypotheses. Our analysis is conducted with two sets of regression models that have household utility arrears (Table 2) and total arrears (Table 3) as the dependent variable. All models are estimated in two versions, with a 1) baseline regression that includes only the test variables for H1 through H5 and control variables for gender and well-being as well as a 2) full model that includes the energy inefficiency test variables for H6. Models v2 and v4 build on v1 and v3 to control for living area (metropolitan to rural) as well as the EU region.

Our findings indicate the household liquidity significantly impacts the incidence of arrears from utility bills and other household expenses, lending strong support for H1. While only model v2 confirms that the incidence of arrears is reduced as net household income increases ($\beta = -0.002$, $p < .05$), the ability for respondents to keep their home warm significantly reduces the incidence of arrears in all four models. Likewise, all models demonstrate that the likelihood of arrears is increased for those households with difficulty making ends meet, offering solid support for H2.

Estimation results also confirm H3 in that the number of persons in a household significantly impacts the incidence of arrears. Interestingly, all models report that households that have more rooms in their home experience less arrears from utility and other bills. All models also indicate that the incidence of arrears is higher as the number of children in a household increases. Furthermore, our four regression models demonstrate that the likelihood of arrears is shown to decrease as individuals get older, validating our H4. Only weak support is found for H5, as optimism towards the future significantly impacts the incidence of arrears for in model v4 alone, which controls for living area in the incidence of total arrears.

Table 2. Utility Arrears Model Comparison

	(1) B Total v1	(2) F Total v1	(3) B Total v2	(4) F Total v2
H1: HH Net Income	-0.001	-0.001	-0.002*	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
H1: Keep home warm	-0.096***	-0.086***	-0.095***	-0.085***
	(0.012)	(0.012)	(0.012)	(0.012)
H2: Full HH size	0.014***	0.013***	0.011**	0.009**
	(0.003)	(0.003)	(0.003)	(0.003)
H2: Rooms in home	-0.006*	-0.006*	-0.005*	-0.005
	(0.003)	(0.003)	(0.003)	(0.003)
H2: Children	0.006	0.006*	0.009**	0.009**
	(0.003)	(0.003)	(0.003)	(0.003)
H3: Age	-0.012**	-0.013***	-0.013***	-0.014***
	(0.004)	(0.004)	(0.004)	(0.004)
H4: Make ends meet	0.053***	0.051***	0.052***	0.049***
	(0.004)	(0.004)	(0.004)	(0.004)
H5: Optimistic future	-0.001	-0.001	-0.005	-0.005
	(0.003)	(0.003)	(0.004)	(0.004)
H6: Rotting windows/floors		0.084***		0.084***
		(0.013)		(0.013)
H6: Damp or leaking walls/ceiling		0.018		0.024*
		(0.012)		(0.012)
Gender	0.004	0.003	0.004	0.002
	(0.007)	(0.007)	(0.007)	(0.007)
Well-being: Satisfaction	-0.005*	-0.002	-0.006*	-0.002
accommodation	(0.002)	(0.002)	(0.002)	(0.002)
Well-being: Satisfaction Std. of	-0.011***	-0.011***	-0.010***	-0.011***
Living	(0.002)	(0.002)	(0.002)	(0.002)
Well-being: Happiness	-0.004	-0.003	-0.005	-0.004
	(0.002)	(0.002)	(0.002)	(0.002)
Well-being: Lonely	-0.015***	-0.015***	-0.013***	-0.012***
	(0.003)	(0.003)	(0.003)	(0.003)
Cost-of-Living Index	0.000	-0.000	0.003***	0.003***
	(0.000)	(0.000)	(0.001)	(0.001)
Metro/Rural living area			0.012**	0.013***
			(0.004)	(0.004)
North			-0.128***	0.000
			(0.029)	(.)
West			-0.113***	0.018
			(0.024)	(0.014)
Centre			0.000	0.133***
			(.)	(0.029)
East			-0.093***	0.034
			(0.017)	(0.027)
South			-0.032*	0.097***
			(0.016)	(0.019)
Constant	0.280***	0.251***	0.185***	0.018
	(0.039)	(0.040)	(0.045)	(0.061)
N	7932.000	7909.000	7919.000	7896.000
AIC	3985.234	3905.560	3922.013	3838.059
BIC	4089.914	4024.147	4061.554	3991.489
R^2	0.130	0.136	0.138	0.145

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3. Total Arrears Model Comparison

	(1) B Total v3	(2) F Total v3	(3) B Total v4	(4) F Total v4
H1: HH Net Income	-0.002	-0.001	-0.003	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)
H1: Keep home warm	-0.190***	-0.166***	-0.187***	-0.163***
	(0.032)	(0.032)	(0.032)	(0.032)
H2: Full HH size	0.028**	0.025**	0.021*	0.018*
	(0.009)	(0.009)	(0.009)	(0.009)
H2: Rooms in home	-0.022**	-0.021**	-0.020**	-0.019**
	(0.007)	(0.007)	(0.007)	(0.007)
H2: Children	0.029**	0.030***	0.035***	0.036***
	(0.009)	(0.009)	(0.009)	(0.009)
H3: Age	-0.062***	-0.064***	-0.065***	-0.067***
	(0.010)	(0.010)	(0.010)	(0.010)
H4: Make ends meet	0.138***	0.130***	0.135***	0.127***
	(0.010)	(0.010)	(0.010)	(0.010)
H5: Optimistic future	-0.013	-0.013	-0.022*	-0.022*
	(0.009)	(0.009)	(0.010)	(0.009)
H6: Rotting windows/floors		0.218***		0.221***
		(0.036)		(0.036)
H6: Damp or leaking walls/ceiling		0.059		0.072*
		(0.032)		(0.032)
Gender	0.006	0.001	0.005	0.000
	(0.019)	(0.019)	(0.019)	(0.019)
Well-being: Satisfaction	-0.014*	-0.005	-0.015**	-0.006
accommodation	(0.006)	(0.006)	(0.006)	(0.006)
Well-being: Satisfaction Std. of	-0.037***	-0.039***	-0.036***	-0.038***
Living	(0.007)	(0.006)	(0.007)	(0.006)
Well-being: Happiness	-0.009	-0.008	-0.011	-0.010
	(0.007)	(0.007)	(0.007)	(0.007)
Well-being: Lonely	-0.040***	-0.039***	-0.035***	-0.033***
	(0.009)	(0.009)	(0.009)	(0.009)
Cost-of-Living Index	0.001	0.001	0.007***	0.007***
	(0.001)	(0.001)	(0.002)	(0.002)
Metro/Rural living area			0.029**	0.031**
			(0.010)	(0.010)
North			-0.303***	0.000
			(0.079)	(.)
West			-0.260***	0.053
			(0.065)	(0.038)
Centre			0.000	0.313***
			(.)	(0.079)
East			-0.252***	0.046
			(0.045)	(0.073)
South			-0.088*	0.214***
			(0.044)	(0.052)
Constant	0.846***	0.773***	0.633***	0.236
	(0.107)	(0.107)	(0.121)	(0.166)
N	7989.000	7966.000	7976.000	7953.000
AIC	19970.568	19811.747	19899.220	19736.952
BIC	20075.355	19930.457	20038.904	19890.541
R^2	0.123	0.129	0.129	0.136

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Most interestingly, confirmation of our key hypothesis, H6, is achieved in all regression models, where having conditions that proxy low energy efficiency of the home are found significant (i.e. rotting windows or floors, damp or leaking walls or ceilings). These results indicate that those individuals with an energy *inefficient* home are likely to have a higher incidence of both utility arrears as well as those from other household expenses.

We also find that controlling for well-being gives more insight into the incidence of arrears. Those that are more satisfied with their current accommodation and standard of living are found to be less likely to fall into arrears in all four models. Interestingly, people that feel particularly lonely are found to be less likely to delay paying their bills in all models as well. These results together support the notion that low levels of emotional well-being can have a visceral and positive impact on one's financial behavior.

Our analysis extends into the influence of the cost of living to find that higher costs of living are associated with a higher incidence of arrears from utility bills as well as rent, and consumer/informal loans. In addition, controlling for metropolitan area shows us that those living in more metropolitan areas are at a higher risk for falling into arrears.

Our EU regional analysis is inconclusive across models, but it does show that countries in the Northern and Western regions have the lowest incidence of arrears, while those in the Eastern, Central, and Southern regions report the highest. These results support our earlier cross-tabulation of arrears by country, which indicated several Baltic and Mediterranean countries observed relatively higher levels of arrears from both utility bills and other household expenses.

IV. DISCUSSION AND CONCLUSION

The recent global financial crisis manifested many debilitating effects across providers of goods and services in almost every industry, including markedly high rates of late payment. Extant literature discusses the primary drivers of arrears which we test in the current study in the context of a post-recession economy. By analyzing the Third Wave of the European Quality of Life Survey, we find that the financial liquidity and the composition of households significantly influence the incidence of arrears from utility bills and other household expenses, including rent and (consumer or informal) loans. We also find that the incidence of these arrears decreases with the age of the head of household. In this manner we inform our understanding of how younger and less financially literate consumers are at a significantly greater risk for arrears than their elder counterparts who have learned financial skills throughout their lives. In addition to these confirmatory findings, we also make two important contributions to the literature around residential energy efficiency, economic policy, and financial literacy.

First, we contribute to the literature around residential energy efficiency in our finding that less energy efficient homes are more likely to fall into utility arrears and other late payments for the household. This is also an important contribution to existing economic and financial literacy theories given that households may not be aware of the influence that

energy inefficiencies of the home can have on their energy consumption and subsequent financial health and spending behavior.

Households that have rotting windows, floors, or doors as well as those with damp or leaking walls and ceilings can experience seasonal fluctuations in their utility bills as a result of these conditions. Insidious in nature, energy inefficient conditions of the home can have a pervasive and visceral effect on the expenses that households incur and ultimately cause them to mismanage or misappropriate their finances (which often times are fixed), leading to late payment to service providers. This finding is especially important to policy makers who are responsible for monitoring the financial welfare of populations that have high incidences of the energy inefficiency conditions we identify in our analysis. While Northern and Western European regions may experience less negative consumer (re)payment behavior, those countries in the Eastern, Central, and Southern regions are indeed more likely to have many of the leading causes of arrears, including energy inefficient homes.

Lastly, our research contributes to literature on consumer well-being in a post-recession context. Interestingly, individuals that report feeling particularly lonely are more likely to pay their bills on time, including those from utilities and other services. More relevant to our thesis, we find that those who report being satisfied with their accommodation and standard of living are significantly less likely to fall into arrears. These findings again underscore the importance of addressing issues around energy efficiency of the accommodation, to increase the likelihood of a satisfactory dwelling and positive household perceptions of well-being. Government programs and grants that help amend issues of residential energy inefficiency can therefore have remarkable benefits on both consumer financial behavior and macroeconomic growth for nations and industry sectors.

V. APPENDIX

Table 4 – Household Observations in EQLS Countries

EU Country	3rd EQLS
Austria	1,032
Belgium	1,013
Bulgaria	1,000
Cyprus	1,006
Czech Republic	1,012
Germany	3,055
Denmark	1,024
Estonia	1,002
Greece	1,004
Spain	1,512
Finland	1,020
France	2,270
Hungary	1,024
Ireland	1,051
Italy	2,250
Lithuania	1,134
Luxembourg	1,005
Latvia	1,009
Malta	1,001
Netherlands	1,008
Poland	2,262
Portugal	1,013
Romania	1,542
Sweden	1,007
Slovenia	1,008
Slovakia	1,000
United Kingdom	2,252
Total	35,516

Figure 4 – Percentage of household utility arrears by EQLS country

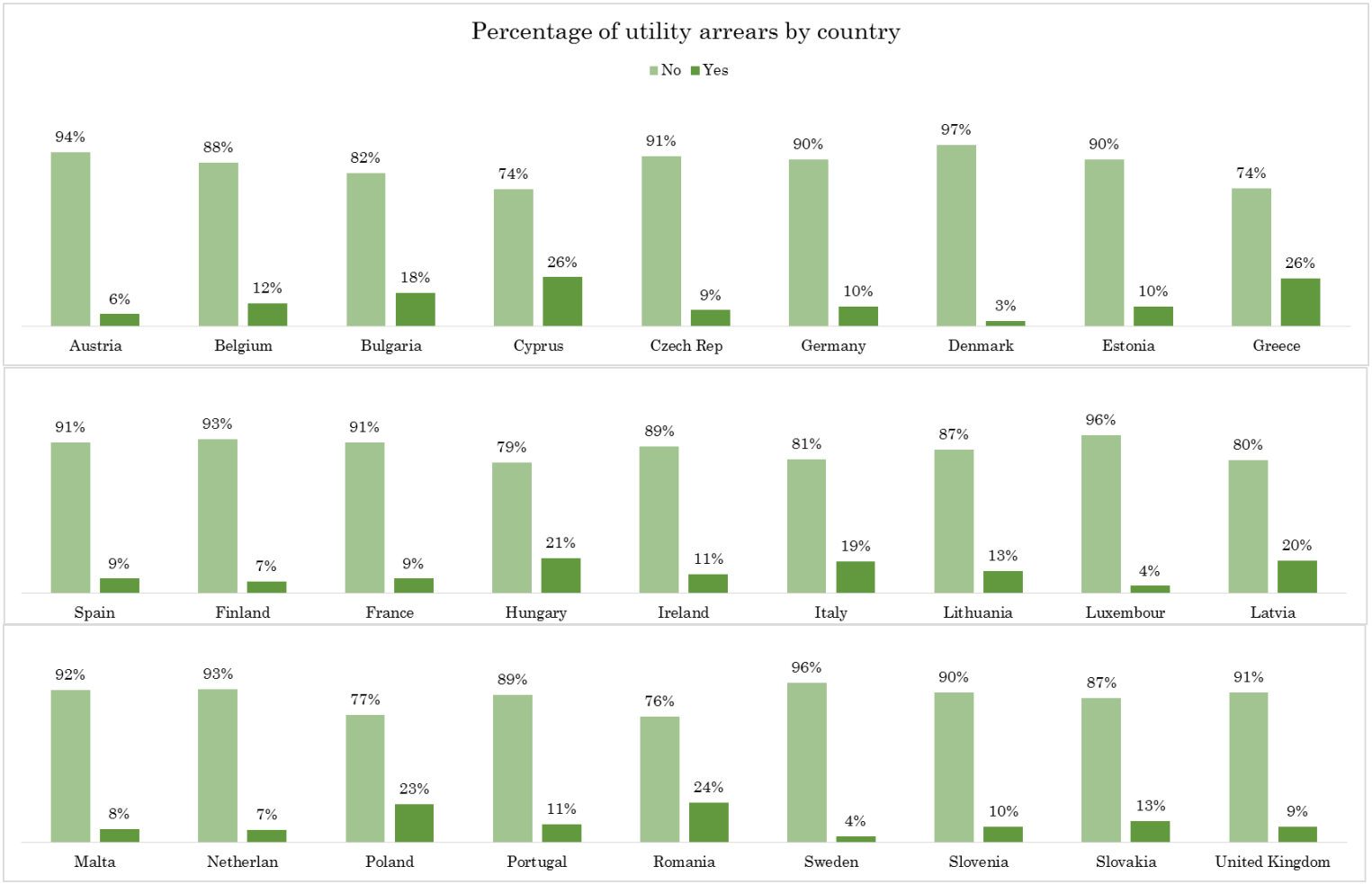


Figure 5 – Percentage of total household arrears by EQLS country

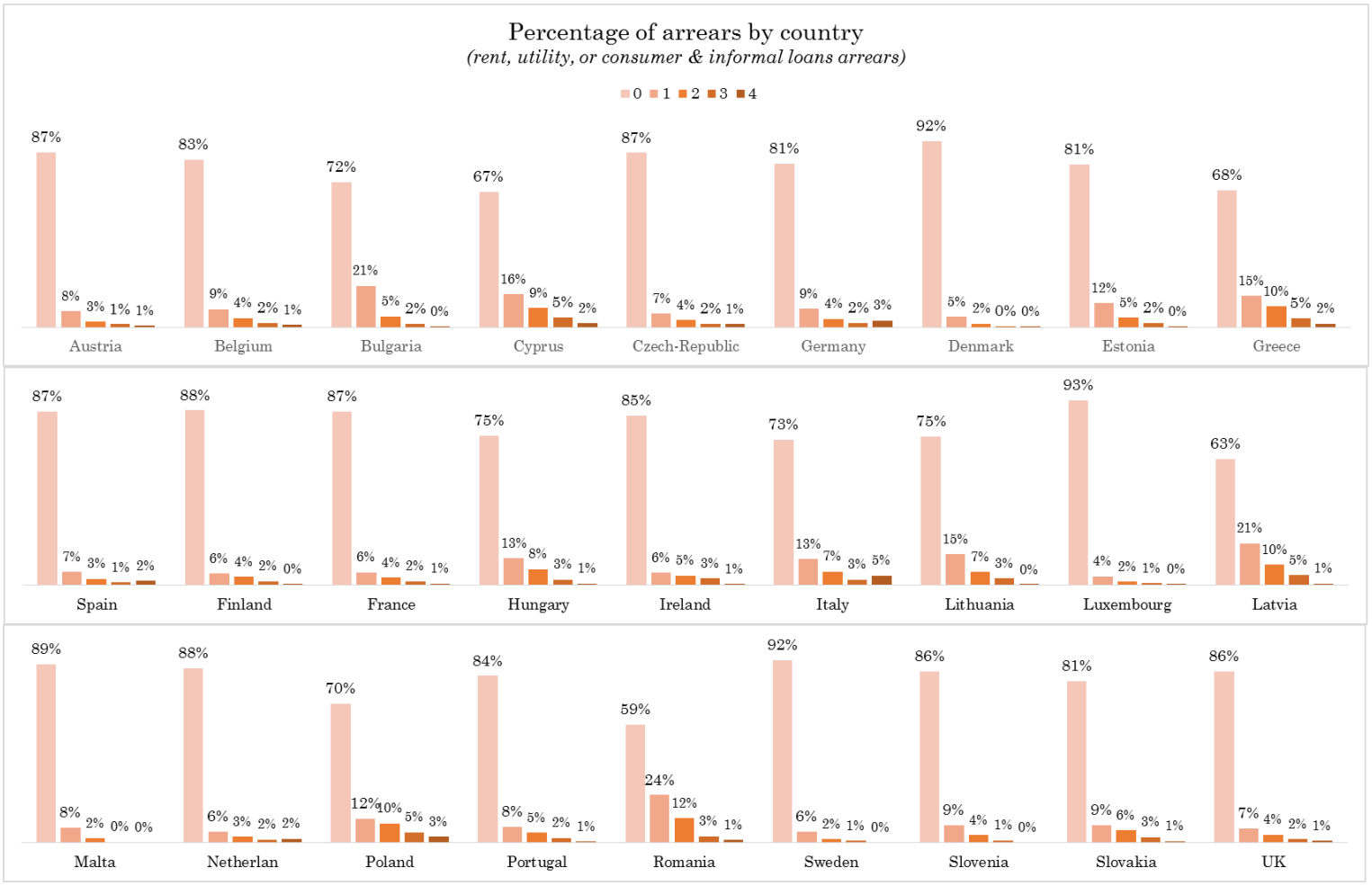
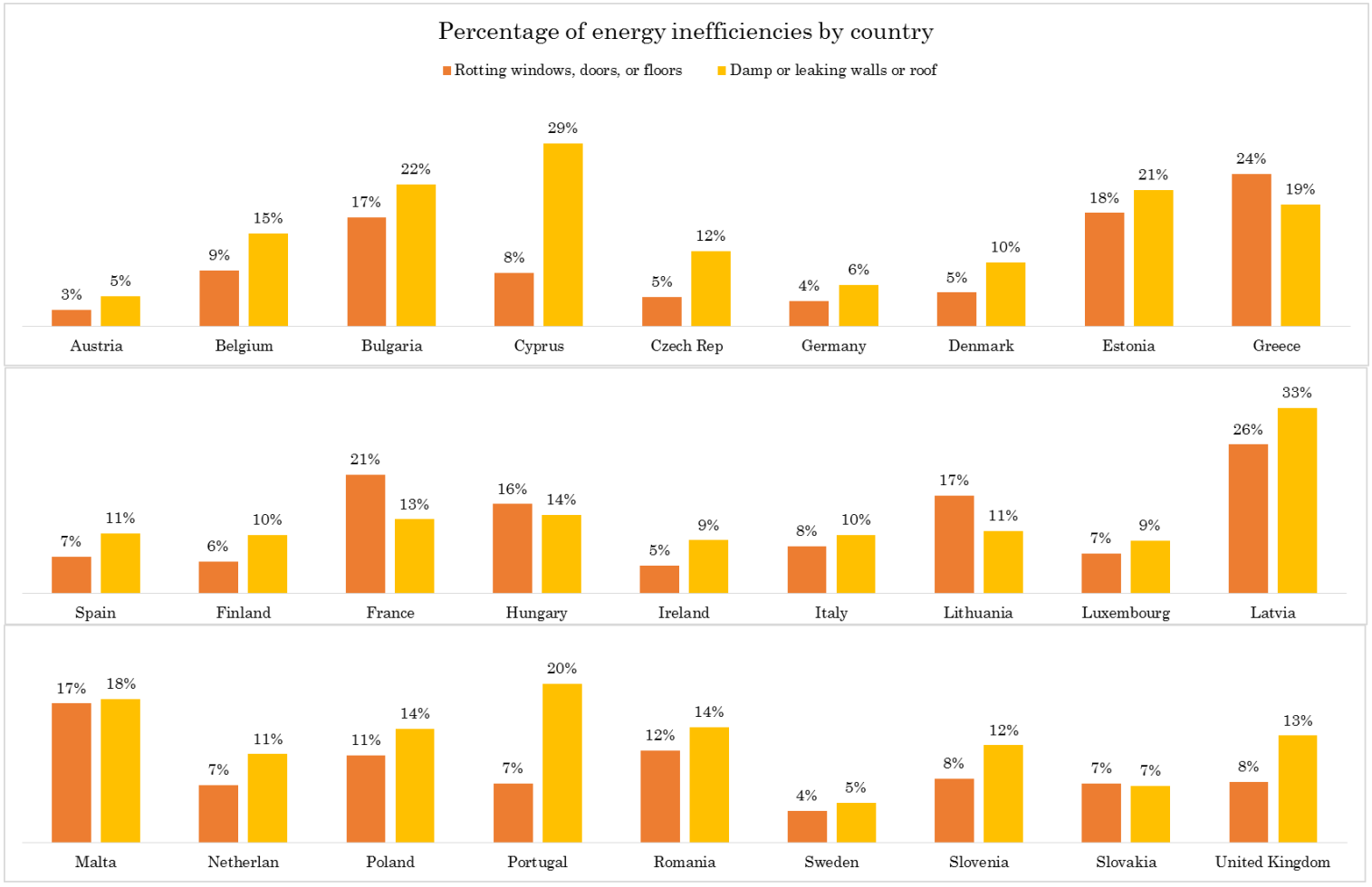


Figure 6 – Percentage of household energy inefficiencies by EQLS countries



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