People are people: a comparative analysis of risk attitudes across Europe

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People are people: A comparative analysis of risk attitudes across Europe

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Abstract

In this paper, we conduct a detailed examination of the determinants of attitudes to financial risk among retail investors in six European countries (Belgium, France, Germany, Italy, Spain and the United Kingdom). We find that respondents from the United Kingdom and Belgium are the most risk tolerant while those from Spain are the least. We observe remarkable similarities in the distributions of risk tolerance across countries despite cultural differences and considerable variations in the extent to which risky investing is undertaken as a routine part of financial planning. We further show that country effects in the cross-sectional variation of attitude to risk scores are swamped by the impacts of gender, salary and wealth, while financial knowledge and prior investment experience are much more important still. Our results have implications for regulators and those who wish to encourage European investors to consider going beyond bank savings and guaranteed products to more prevalent stock market investing in an era of negative real interest rates.

KEYWORDS

attitude to risk, European countries, financial decisions, investment experience, retail investors, risk tolerance

1 | INTRODUCTION

According to standard finance theory, in an expected utility framework an investor will make a choice between a risk-free asset and various risky securities that maximizes the expected utility of the outcome. Within the financial decision-making domain, this expected utility will be a function of the investor's risk tolerance, the expected portfolio returns and the level of risk. Financial risk tolerance therefore has significant implications for retail investor decision-making and, in turn, for the financial markets more broadly as a key ingredient in asset allocation and financial product selection. All else being equal, more risk averse investors will have stronger preferences for risk-free savings over risky investments, reducing demand for the latter unless the risk premia offered are sufficiently high. Since risky investing is usually rewarded by higher returns in the long run, individuals who eschew it in favour of bank savings or lower risk fixed income investments are likely to accumulate lower portfolio values over long horizons. This could have serious repercussions for the amount of money they have available in retirement.

Perhaps surprisingly given its significance in underpinning investment choices, there is very little extant research that compares individual risk tolerance across countries. Such an investigation is warranted given the

potential effects of a range of factors including cultural differences, wealth and income levels and prior investment experience. This study examines the financial risk preferences of a large sample of European retail investors, and to our knowledge, this is the first pan-European research into the factors that affect financial risk tolerance. We employ a consistent attitude to risk questionnaire and sampling frame in the United Kingdom, France, Germany, Italy, Spain and Belgium, creating a combined dataset of over 5000 respondents. This consistency ensures that what Weber and Milliman (1997) refer to as 'situational differences' (such as variations in the measurement framework or the framing of question items) between samples do not contaminate the findings, leading to potentially spurious variation in outcomes. This issue would render attempts to compare attitudes to risk across separate within-country studies problematic.

Most existing studies have deliberately compared risk preferences across countries having very divergent cultural backgrounds, such as those in Southeast Asia and in the West, with the US versus China being frequently used examples. However, by contrast, our study employs data from six European countries, which are culturally much more similar. As well as being in close geographical proximity to one another, these countries share economic systems based on a capitalist ideology, they have smaller divergences in wealth and incomes per capita, and smaller divergences in educational priorities. All six fit under the 'WEIRD' umbrella, in that they are Western, educated, industrialised, rich and democratic, although there are, nonetheless, non-negligible differences in the economic situations and lifestyles between the six nations that could drive variations in risk appetites, as we discuss below.

This study examines the financial risk tolerance of a large sample of European retail investors, and to our knowledge, this is the first comprehensive, pan-European research into the factors that affect financial risk tolerance. Novelly, we employ a consistent attitude to risk measurement framework in the UK, France, Germany, Italy, Spain and Belgium, creating a combined dataset of over 5,000 respondents. Prior research has suggested that lottery-type experiments where participants make a set of choices between a risky investment with given probabilities of positive or negative outcomes and a risk-free investment require complex terminology that may be difficult to understand and therefore yield unrealistic results (see Charness et al., 2013). Despite the limitation, the majority of existing studies continue to employ this 'willingness to pay' approach (also sometimes known as the multiple price list method) for measuring risk tolerance. By contrast,vestment landscape and financial we use a reliable scale based on a psychometric questionnaire that is widely used in practice and having a strong conceptual underpinning. In so doing, we aim to explain the cross-sectional variation in risk tolerance across Europe. Although widely used in practice, this particular instrument for measuring attitude to risk has only previously been used in academic research in the UK. We also employ a wider range of control variables than used in any existing, related studies.

To anticipate our key findings, interestingly, we find that both the distribution of risk tolerance across survey participants, and the factors that affect it, are similar between countries. We find that individual characteristics such as investment experience and investment knowledge, gender and income are far more important determinants of risk tolerance than country fixed effects. This finding is perhaps surprising given the considerable differences that exist in the investment context, and levels of savings and wealth as well as financial knowledge across Europe.

We employ a robust and well-tested scale based on psychometric principles to determine attitude to financial risk. The choice of instrument is key since different approaches to measuring risk preferences can lead to substantively divergent findings (MacCrimmon & Wehrung, 1990) and a sub-optimal choice of tool can mask the underlying stability in risk preferences (Schoemaker, 1993). Using a risk measurement instrument that is well designed and clearly understood is essential, since retail investors often find it excessively challenging to make the best choices because they find finance too complicated (Hillenbrand et al., 2020).

The remainder of this paper develops as follows. The following section identifies the previous literature on the factors that affect financial risk tolerance, with a particular focus on culture and what is already known about risk preferences among European investors. Section 3 then outlines our data sources and introduces the instrument we employ to measure attitude to risk and the methods we use for analysis. Section 4 presents and discusses the results while section 5 concludes and offers policy recommendations.

2 | LITERATURE REVIEW

2.1 | Culture and risk tolerance

We first examine the existing research on the impact of culture on decision-making, with a particular focus on financial choices. The Cambridge English dictionary defines culture as 'the way of life, especially the general customs and beliefs, of a particular group of people at a particular time'. A slightly more elaborate, but nonetheless well-established definition is due to Kroeber and Parsons (1958, p. 583) that culture is 'transmitted and created content and patterns of values, ideas and other symbolic-meaningful systems as factors in the shaping of human behavior'.

There is evidence for cultural differences in levels of confidence in responses to knowledge questions and the way that the probabilities of uncertain outcomes are assessed (e.g., Lee et al., 1995; Wright & Phillips, 1979, 1980). Differences in risk preferences in general (e.g., Douglas & Wildavsky, 1982) and in employment choices attributable to culture (Hong, 1978) have also been documented. Furthermore, Seto and Bogan (2013) document significant differences in the holdings of different classes of financial assets among immigrants to the United States from different countries. Therefore, it is entirely reasonable to expect that cultural variations will affect investors' appetites for taking financial risks too, and differences in investment risk tolerances could manifest through several channels.

One such route is through what Hsee and Weber (1999) term the 'cushion hypothesis', which postulates that those belonging to collective societies (e.g., those in Asia) will be more willing to accept risks due to 'social diversification'. Consistent with the cushion hypothesis, they find that their Chinese participants are significantly more risk tolerant in the investment domain than the Americans, although there are no statistically significant differences between the risk preferences of the two groups in the other domains they investigate.

Weber and Hsee (1998) provide a further test of the cushion hypothesis by comparing the willingness to pay for financial options among Chinese, German, American and Polish participants. They found that the Chinese were willing to pay the most, with the Americans the least, a result that Weber and Hsee attribute to cultural variations in how risky the options were viewed as being rather than differences in risk tolerance per se.

Counter to this argument, however, or perhaps even as a direct result of it, formal market solutions to manage risks (such as insurance, structured products and other well diversified instruments) might be less available in countries where cushion effects are strongest. This would leave the overall amount of protection (from private and public sources) available to those taking risks roughly the same despite cultural variations.

Another important cultural dimension to consider is uncertainty avoidance, the degree to which people in a country prefer structured over unstructured situations and their tolerance for uncertainty. According to Hofstede, ambiguity about the future and the anxiety it brings is handled differently within different cultures (Hofstede, 2001; Hofstede et al., 2010), and research suggests how such cultural differences in attitudes towards uncertainty avoidance consequently impact judgements of risk (Hofstede, 1980; Vasvári, 2015).

More generally, when people are intolerant of uncertainty, they do not like to be in situations where there is ambiguity about what will happen in the future (Buhr & Dugas, 2009). Since individual intolerance to uncertainty can cause anxiety, it is therefore clear why it is highly negatively correlated with the tendency to purchase risky assets and participate in the stock market (Conlin et al., 2015).

Within European countries, it is suggested that there are differences in uncertainty avoidance that can influence individuals' motivations. Countries whose people have a high uncertainty avoidance culture therefore tend to be risk averse, and contrastingly, those with a low uncertainty avoidance culture are able to tolerate ambiguity about the future, taking greater risks. Individuals in high avoidance cultures prefer stability in their lives and careers, and they structure their behaviour through mechanisms such as laws, religion or customs (Hofstede, 1980; Kang & Kim, 2019).

Cultural factors can also influence the extent to which people are intolerant of uncertainty and try to avoid it (e.g., Hofstede et al., 2010; House et al., 2004), where countries such as Greece, Portugal and Belgium have high levels of uncertainty avoidance, but Denmark, Sweden and the United Kingdom had low levels (Kang & Kim, 2019). It has been suggested that those in low uncertainty avoidance cultures have a higher interest in employee stock ownership because people there are largely driven to perceive uncertain situations as desirable, challenging and interesting (Furnham & Ribchester, 1995; Hofstede et al., 2010). Cultural variations in risk tolerance appear to arise alongside differences in personal discount rates and the degree of positive time preference, with investors in countries where risk perceptions were heightened (e.g., located in Eastern Europe or Africa) having higher discount rates and preferring short-term investments (Wang et al., 2016).

Research has also investigated the links between risk aversion and religiosity, with mixed results. In general, the consensus appears to be that people with more strongly held religious views are more risk averse (e.g., Dohmen et al., 2011; Hilary & Hui, 2009; Noussair et al., 2013), although there are also contrary findings (such as Hong et al., 2004). This issue is relevant for our study since the proportion of people with religious beliefs and participation in church-going and religious festivals varies considerably across our sample countries. Noussair et al. (2013) indicate that it is the interactions between people that arise as a result of worship rather than beliefs per se that influence attitude to risk. Although most Western Europeans

continue to identify as Christians, church attending Christians ranges from 40% in Italy to 9% in Scandinavian countries with non-practicing Christians making-up the majority of populations across Europe (PEW Research Center, 2018).

The locus of control—the degree to which people feel they have control over their actions and the events that influence their lives—also relates to financial risk-taking behaviour where those who have a higher locus of control tend to save more but are also more likely to own risky assets and have a higher share of risky investments (Cobb-Clark et al., 2016; Salamanca et al., 2016). It is further suggested that this perception can differ based on culture, whether from an individualist or collectivist society. Individualist countries such as the United Kingdom and United States have higher internal locus of control in comparison to collectivist societies in China and Japan who have more external locus of control, believing that what happens to them is greatly due to external factors within the environment (Hamid, 1994; Hui, 1982; Spector et al., 2002). A potential reason behind an external locus of control in countries such as China could be due to the presence of regimes that have imposed stronger restrictions over various aspects of life than Western governments. This is a similar case for Central and Eastern Europe, although transitioning from communism has allowed for observation of changes in the locus of control between generations. Varnum (2008) found that younger generations in Central Europe have more of an internal locus of control compared to older generations, and a greater difference across generations exists in comparison to older versus younger generations in North America and Western Europe.

Personality traits such as the 'Big Five' (extroversion, neuroticism, agreeableness, openness and conscientiousness) have been used to explain differences in behaviour and decisions across various aspects of life, providing insight into universal ways of thinking, feeling and behaving (McCrae & Costa, 1997). Nicholson et al. (2005) further highlight that personality impacts risk-taking behaviour. Extraversion and openness to experience can motivate taking risks, whereas traits of agreeableness and emotional stability help the risk-taker remain resilient during periods of turbulence. Not being too conscientious also reduces inertia as individuals are less prone to overthinking about potential risks. Such personality traits can differ between nations and therefore may further explain cross-cultural risk-taking differences. For example, Kajonius and Mac Giolla (2017) found that countries in East Asia scored lower than European countries on measures of agreeableness and openness, but higher on neuroticism.

Allik and McCrae (2004) found that as a general rule, neighbouring countries had similar personality traits with geographically and historically different regions being less similar. Austrians and Germans had the greatest similarity, with other pairs clustering well together such as, Hispanics and Peruvians, Hungarians and Serbians, French and White South Africans, Belgians and Spaniards, Portuguese and Russians, Canadians and Americans, Danes and Norwegians, Estonians and Dutch, Black South Africans and Zimbabweans, Filipinos and Indonesians, Hong Kong and Taiwan Chinese and Marathi- and Telugu-speaking Indians. Further analysis showed geographical location can lead to variations in personality traits. Europeans and Americans appeared more outgoing, open to new experiences but less agreeable as such traits are more valued in Western cultures. However, relating differences in personality traits solely to culture based on geographical location would be inappropriate given other similarities between regions such as religion, climate, language, ancestry and genetics (Cavalli-Sforza et al., 1994).

2.2 | The European investment landscape and financial risk tolerance

Utility theory suggests that retail investors in any country will select the financial products that maximize their expected utilities, preferring portfolios with higher expected returns and lower risks. Each investor's degree of risk aversion will capture the trade-off between these two attributes (risk and return) with a common and complete information set. Consequently, even in a world of fully rational decision-makers, systematic variations in risk tolerance could arise across European countries due to differences in innate risk tolerances or differences in the products available and their risk–return characteristics.

If we then overlay the issue that choices are often not made fully rationally, further differences in average risk tolerances between nations can manifest as a result of differences in the subjective probabilities assigned to different outcomes because people are more optimistic or have different dispositions to certain personality types. This point is particularly pertinent in view of the design of our instrument (described below) that explicitly incorporates items on investors' emotional reactions to risk (see, for instance, Loewenstein et al., 2001, among many others). Cross-country differences in investors' tendencies to suffer from behavioural biases or to make use of heuristics when assessing the attractiveness of investments could also lead to differences in risk tolerance (e.g., MacGregor et al., 2000).

In a report produced for the European Union, Chater et al. (2010) conducted an extensive survey of retail investor financial decision-making across Europe. Although they do not investigate the causal factors for cross-country differences in practices or decision-making as we do in this study, they identify that German financial product distribution is primarily through banks, whereas in the United Kingdom it is through independent financial advisors. In the latter country, obtaining financial advice independently is more embedded (Linciano & Soccorso, 2012). The French have a tendency to buy life insurance products as investments, although this is rare in the United Kingdom, where there is a greater exposure to purchases of stocks and bonds, either directly or through a financial advisor (Chater et al., 2010).

Chater et al. note that, in the latest data available at their time of writing, average earnings were highest in the United Kingdom (€42,500) of all 10 countries they surveyed yet its average pension wealth was the lowest by a considerable margin. The gross household savings rate was also far lower in the United Kingdom (2% of disposable income compared with an EU average of 11% and around 15% in France, Germany and Italy). Spain, the United Kingdom and Italy had the highest share of owner-occupied housing (85%, 69% and 68%, respectively), compared with 58% in France and just 39% in Germany. Chater et al. also identify significant differences in the typical tendency for households to make investments (e.g., in stocks or bonds) rather than holding savings. French investors hold an average of 32% of their wealth in cash, while the figures are, respectively, 39% in Germany; 42% in Italy; 49% in Spain; 30% in the United Kingdom.

A more recent practitioner study by Ferreira (2018) employs data from a large-scale annual survey of risk attitudes in 15 countries that has been undertaken by ING since 2012. Ferreira documents considerable country-level differences in measured risk tolerance, with the Germans and Dutch identified as much less risk tolerant than people from the United Kingdom or United States. However, this appears to arise alongside the observation that people in several countries including Germany view more risky investments as also having lower expected returns, in contradiction of orthodox finance theory. The ING survey does not involve a psychometric questionnaire and requires respondents to understand the asset classes and be knowledgeable about their relative risk levels, and a lack of such a background among some respondents might explain the counter-intuitive results.

Despite evidence pointing to potential cross-cultural differences in risk-taking behaviour, limited studies have explored attitudes to financial risk using a comparable psychometric approach across European countries. Altogether, and based on our synthesis of the existing literature on cultural differences, income disparities and variations in investment opportunities and experiences has several implications for likely patterns in attitude to risk in the six countries that we investigate:

- Investors in northern European countries (Germany, the United Kingdom) would be expected to be more risk tolerant than those in other countries due to their lesser degree of uncertainty avoidance.
- Italian and Spanish investors would be expected to be less risk tolerant than others due to their greater religiosity and a Catholic rather than protestant outlook and lesser investment experience and knowledge.
- UK-based investors would be expected to be more risk tolerant than those from other countries due to their higher levels of income and the higher proportion of investors obtaining financial advice where they can be provided with reassurance about the nature and extent of the risks that they are taking.

3 | DATA AND METHODS

3.1 | Measuring attitude to risk

We use a survey method to collect the data. The core of our study involves measuring attitudes to risk across six European countries using an attitude to risk questionnaire (ATRQ). The one that we employ in this study is an instrument obtained from a UK-based company, Distribution Technology, that is used in their suite of tools to support financial advisors engaging with their clients. The ATRQ comprises of 15 questions and was developed by academics (see Brooks, Hillenbrand, & Money, 2018) using psychometric principles following the approach initially established by Grable and Lytton (1999). It aims to incorporate information on the content and structure of risk tolerance, with questions on the drivers of risk-taking behaviour (the pursuit of greater returns) and the constrainers (loss avoidance). Each of the 15 items is classified as being principally cognitive, behavioural or emotional in terms of how it affects attitude to risk. The latter is relatively unique among ATRQs, the majority of which focus on aspects of what investors would do in certain situations rather than how taking risks makes them feel. This limitation of other instruments occurs despite the importance of emotions and personality in influencing financial decision-making identified in the literature (e.g., Brooks et al., 2022; Brooks & Williams, 2021), with (over)confidence and their degree of optimism also influencing choices (Nosić & Weber, 2010). This ties in

with Loewenstein et al. (2001) view that risks will be evaluated based on the individual's affective reaction and not just based on a purely objective cognitive basis, and therefore measures based just on objective risk and return language will be inappropriate.

Distribution Technology's tool was designed to use as little specialist terminology as possible, which is a desirable attribute since many approaches to measuring risk tolerance incorporate sophisticated language that retail investors will struggle to comprehend (Linciano & Soccorso, 2012). The questionnaire that we use is firmly rooted in the financial domain rather than reflecting risk taking in other aspects of life or more generally. It also deliberately frames questions in different ways, such as emphasising possible losses in some questions and potential gains in others, so that the various implications of risk-taking are all considered.

The ATRQ was subject to extensive testing on a broad cross-section of the retail investor population in the United Kingdom, with the observed Cronbach alpha from the responses being 89%, demonstrating its reliability, as well as the solution having a natural three-factor interpretation when subjected to principal components analysis. In addition, the tool was established for use in actual retail investment situations and has been widely used in practice, and we therefore feel confident in using it as a way to measure risk preferences. In order to compare attitudes to risk across Europe, the UK ATRQ was translated from English to five different languages (French, German, Italian, Spanish and Dutch) with assistance from local subject matter experts to examine attitudes to risk in six European countries (United Kingdom, France, Germany, Italy, Spain and Belgium). These countries were of particular interest as large European countries which have differences in investing and saving behaviours as well as perceptions of risk (Chater et al., 2010; Ferreira, 2018). In all cases, each item in the questionnaire is measured on a Likert scale, and the aggregate score is translated into an overall scale ranging from 1 (least risk tolerant/most risk averse) to 10 (most risk tolerant/least risk averse).

3.2 | The survey framework and summary statistics

The study was completed using the Qualtrics platform and respondents were recruited using Prolific and a set of quotas (being a resident of the target country and fluent in that respective language). We targeted 1000 respondents in each country but removed those who provided incomplete questionnaires, were 'straight-lining' or taking less than a third of the mean time to complete, as well as any outliers. A range from 800 to 1100 respondents were available for data analysis within each country (except Belgium), with 5231 respondents in total (see Table 1).

Respondents were informed about the purpose of the questionnaire to be completed and provided relevant demographic information (gender identity, age, marital status, education level, occupational status, salary, wealth, knowledge of investing and experience of working with a financial advisor or not).

Summary statistics for the respondents' demographic information are presented in Table 1. The samples are remarkably homogeneous across the countries with the possible exception of the United Kingdom, where respondents are typically older and having the characteristics that would normally be associated with that: they typically have more investment experience, higher incomes, are wealthier, more likely to be married or divorced, less likely to be students and are less well educated.

Across Europe (excluding the United Kingdom), around 70%–80% of the sample are between the ages of 18 and 35, while less than 1% are retired, and around 15% are married, c. 2% separated, divorced or widowed. Again, across all countries (ex UK), between a third and a half of respondents are students, with the majority of the remainder being in full-time employment. About 10% of participants are unemployed in France, Italy and Spain, while the figures are much lower in Germany (4%), Belgium (3%) and the United Kingdom (5%), to some extent reflecting the relative unemployment figures among the general populations in these countries.

Salary and wealth figures reported in Panels F and G of Table 1 are in British pounds for the United Kingdom and euro for all other countries. Reflecting their relative youth, excluding the United Kingdom, most respondents have low incomes and have yet to accumulate much wealth, although around 25%–30% have incomes of €30,000 or more and wealth of at least €100,000.

Turning to respondents' prior engagements with financial advice (Panel H), around 60% of the United Kingdom sample are either currently receiving advice or have done so in the past, but the figures are much lower in the other countries at around 20% in France, 27% in Germany, 32% in Italy, 24% in Spain and 28% in Belgium. Similarly, around 60% of UK respondents state that they have investment experience, considerably more than elsewhere (30%–45%).

Self-assessed knowledge of investing (Panel J of Table 1) presents a fascinatingly different picture. Despite their lack of experience with investing, the mean financial knowledge scores on a 1–5 scale are only slightly smaller for France (2.6), Germany (2.6) Spain (2.7) and Belgium (2.7) than they are for the United Kingdom (3.0). It is just the Italian sample that has a considerably lower average investment knowledge score (2.0). These

TABLE 1 Summary statistics.

Variable	UK ($n = 891$)	France ($n = 781$)	Germany ($n = 1044$)	Italy ($n = 1083$)	Spain ($n = 1076$)	Belgium ($n = 356$)	Overall ($n = 5231$)
Panel A: Gender							
Female	481 (54.0%)	374 (47.9%)	524 (50.2%)	506 (46.7%)	523 (48.6%)	183 (51.4%)	2591 (49.5%)
Male	408 (45.8%)	393 (50.3%)	505 (48.4%)	557 (51.4%)	533 (49.5%)	167 (46.9%)	2563 (49.0%)
Other	2 (0.2%)	14 (1.8%)	15 (1.4%)	20 (1.8%)	20 (1.9%)	6 (1.7%)	77 (1.5%)
Panel B: Age							
18–24	76 (8.5%)	366 (46.9%)	416 (39.8%)	515 (47.6%)	429 (39.9%)	175 (49.2%)	1977 (37.8%)
25–34	149 (16.7%)	265 (33.9%)	442 (42.3%)	408 (37.7%)	348 (32.3%)	120 (33.7%)	1732 (33.1%)
35–44	177 (19.9%)	92 (11.8%)	128 (12.3%)	101 (9.3%)	176 (16.4%)	45 (12.6%)	719 (13.7%)
45–54	156 (17.5%)	39 (5.0%)	34 (3.3%)	38 (3.5%)	88 (8.2%)	14 (3.9%)	369 (7.1%)
55–64	163 (18.3%)	16 (2.0%)	17 (1.6%)	21 (1.9%)	32 (3.0%)	2 (0.6%)	251 (4.8%)
65–74	135 (15.2%)	2 (0.3%)	7 (0.7%)	0 (0%)	2 (0.2%)	0 (0%)	146 (2.8%)
75+	35 (3.9%)	1 (0.1%)	0 (0%)	0 (0%)	1 (0.1%)	0 (0%)	37 (0.7%)
Panel C: Marital status							
Single	290 (32.5%)	614 (78.6%)	888 (85.1%)	962 (88.8%)	831 (77.2%)	287 (80.6%)	3872 (74.0%)
Divorced	70 (7.9%)	11 (1.4%)	15 (1.4%)	11 (1.0%)	15 (1.4%)	9 (2.5%)	131 (2.5%)
Married	484 (54.3%)	150 (19.2%)	139 (13.3%)	103 (9.5%)	219 (20.4%)	57 (16.0%)	1152 (22.0%)
Separated	26 (2.9%)	4 (0.5%)	2 (0.2%)	6 (0.6%)	9 (0.8%)	2 (0.6%)	49 (0.9%)
Widowed	21 (2.4%)	2 (0.3%)	0 (0%)	1 (0.1%)	2 (0.2%)	1 (0.3%)	27 (0.5%)
Panel D: Education							
School leaver	154 (17.3%)	5 (0.6%)	102 (9.8%)	17 (1.6%)	38 (3.5%)	2 (0.6%)	318 (6.1%)
A-levels or equivalent	261 (29.3%)	120 (15.4%)	440 (42.1%)	510 (47.1%)	327 (30.4%)	76 (21.3%)	1734 (33.1%)
Degree	333 (37.4%)	342 (43.8%)	284 (27.2%)	382 (35.3%)	468 (43.5%)	207 (58.1%)	2016 (38.5%)
Higher degree	143 (16.0%)	314 (40.2%)	218 (20.9%)	174 (16.1%)	243 (22.6%)	71 (19.9%)	1163 (22.2%)
Panel E: Occupation							
Retired	169 (19.0%)	3 (0.4%)	9 (0.9%)	3 (0.3%)	4 (0.4%)	0 (0%)	188 (3.6%)
Full-time employment	434 (48.7%)	336 (43.0%)	385 (36.9%)	268 (24.7%)	432 (40.1%)	172 (48.3%)	2027 (38.7%)
Houseperson	50 (5.6%)	4 (0.5%)	14 (1.3%)	7 (0.6%)	14 (1.3%)	1 (0.3%)	90 (1.7%)
Part-time employment	146 (16.4%)	61 (7.8%)	115 (11.0%)	138 (12.7%)	133 (12.4%)	14 (3.9%)	607 (11.6%)
Semi-retired	15 (1.7%)	2 (0.3%)	3 (0.3%)	0 (0%)	3 (0.3%)	0 (0%)	23 (0.4%)
Student	33 (3.7%)	294 (37.6%)	472 (45.2%)	547 (50.5%)	372 (34.6%)	159 (44.7%)	1877 (35.9%)

(Continues)

TABLE 1 (Continued)

Variable	UK ($n = 891$)	France ($n = 781$)	Germany ($n = 1044$)	Italy ($n = 1083$)	Spain ($n = 1076$)	Belgium ($n = 356$)	Overall ($n = 5231$)
Unemployed	44 (4.9%)	81 (10.4%)	46 (4.4%)	120 (11.1%)	118 (11.0%)	10 (2.8%)	419 (8.0%)
Panel F: Salary							
Less than 10,000	122 (13.7%)	331 (42.4%)	417 (39.9%)	595 (54.9%)	484 (45.0%)	146 (41.0%)	2095 (40.0%)
10,000–19,999	174 (19.5%)	133 (17.0%)	218 (20.9%)	199 (18.4%)	242 (22.5%)	27 (7.6%)	993 (19.0%)
20,000–29,999	207 (23.2%)	132 (16.9%)	96 (9.2%)	153 (14.1%)	189 (17.6%)	76 (21.3%)	853 (16.3%)
30,000–49,999	260 (29.2%)	120 (15.4%)	160 (15.3%)	98 (9.0%)	125 (11.6%)	77 (21.6%)	840 (16.1%)
50,000–69,999	81 (9.1%)	39 (5.0%)	106 (10.2%)	27 (2.5%)	22 (2.0%)	21 (5.9%)	296 (5.7%)
70,000+	47 (5.3%)	26 (3.3%)	47 (4.5%)	11 (1.0%)	14 (1.3%)	9 (2.5%)	154 (2.9%)
Panel G: Wealth							
Less than 10,000	262 (29.4%)	448 (57.4%)	525 (50.3%)	604 (55.8%)	553 (51.4%)	143 (40.2%)	2535 (48.5%)
10,000–49,999	258 (29.0%)	209 (26.8%)	354 (33.9%)	319 (29.5%)	302 (28.1%)	115 (32.3%)	1557 (29.8%)
50,000–99,999	136 (15.3%)	57 (7.3%)	87 (8.3%)	79 (7.3%)	97 (9.0%)	48 (13.5%)	504 (9.6%)
100,000–199,999	115 (12.9%)	24 (3.1%)	45 (4.3%)	51 (4.7%)	64 (5.9%)	38 (10.7%)	337 (6.4%)
200,000–299,999	41 (4.6%)	17 (2.2%)	16 (1.5%)	13 (1.2%)	29 (2.7%)	7 (2.0%)	123 (2.4%)
300,000+	79 (8.9%)	26 (3.3%)	17 (1.6%)	17 (1.6%)	31 (2.9%)	5 (1.4%)	175 (3.3%)
Panel H: Experience with a financial adviser							
None	343 (38.5%)	618 (79.1%)	760 (72.8%)	730 (67.4%)	823 (76.5%)	255 (71.6%)	3529 (67.5%)
Current	187 (21.0%)	38 (4.9%)	59 (5.7%)	96 (8.9%)	42 (3.9%)	16 (4.5%)	438 (8.4%)
Previous	361 (40.5%)	125 (16.0%)	225 (21.6%)	257 (23.7%)	211 (19.6%)	85 (23.9%)	1264 (24.2%)
Panel I: Investing experience							
No	376 (42.2%)	573 (73.4%)	629 (60.2%)	750 (69.3%)	654 (60.8%)	194 (54.5%)	3176 (60.7%)
Yes	515 (57.8%)	208 (26.6%)	415 (39.8%)	333 (30.7%)	422 (39.2%)	162 (45.5%)	2055 (39.3%)
Panel J: Investment knowledge							
Mean (*SD*)	2.97 (1.14)	2.62 (1.30)	2.60 (1.27)	2.00 (1.09)	2.74 (1.24)	2.70 (1.25)	2.58 (1.25)
Median [Min, Max]	3.00	2.00	3.00	2.00	3.00	2.00	2.00

Note: This table presents the summary statistics of all demographic variables (gender, age, marital status, education, occupation, salary, wealth, experience with a financial advisor, investing experience and investment knowledge) for each European country broken down into the subcategories that make up these variables. The values within parentheses represent the percentage of respondents within each subcategory.

TABLE 2 Attitude to risk scores across countries.

Panel A: Summary measures							
	UK ($n = 891$)	**France ($n = 781$)**	**Germany ($n = 1044$)**	**Italy ($n = 1083$)**	**Spain ($n = 1076$)**	**Belgium ($n = 356$)**	**Overall ($n = 5231$)**
Mean (*SD*)	5.17 (1.51)	4.89 (1.57)	5.07 (1.68)	4.69 (1.47)	4.51 (1.55)	5.15 (1.54)	4.87 (1.58)
Median	5.00	5.00	5.00	5.00	4.00	5.00	5.00
[Min, Max]	[1.00, 10.0]	[1.00, 9.00]	[1.00, 10.0]	[1.00, 10.0]	[1.00, 10.0]	[1.00, 9.00]	[1.00, 10.0]
Missing	0 (0%)	9 (1.2%)	6 (0.6%)	12 (1.1%)	5 (0.5%)	4 (1.1%)	36 (0.7%)

Panel B: Distribution of attitude to risk scores (numbers of respondents)											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Overall**
UK	10	29	77	148	270	198	105	46	5	3	891
France	1	32	119	191	171	132	80	34	12	0	781
Germany	10	46	140	189	245	196	128	67	14	3	1044
Italy	5	55	162	273	295	150	96	28	6	1	1083
Spain	19	85	174	265	251	170	75	2	4	1	1076
Belgium	2	11	38	69	92	65	52	21	2	0	356
Sum All Countries	47	258	710	1135	1324	911	536	223	43	8	5231

Panel C: Distribution of attitude to risk scores (percentage of respondents)											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Overall**
UK	1.1%	3.3%	8.6%	16.6%	30.3%	22.2%	11.8%	5.2%	0.6%	0.3%	100.0%
France	0.1%	4.1%	15.2%	24.5%	21.9%	16.9%	10.2%	4.4%	1.5%	0.0%	100.0%
Germany	1.0%	4.4%	13.4%	18.1%	23.5%	18.8%	12.3%	6.4%	1.3%	0.3%	100.0%
Italy	0.5%	5.1%	15.0%	25.2%	27.2%	13.9%	8.9%	2.6%	0.6%	0.1%	100.0%
Spain	1.8%	7.9%	16.2%	24.6%	23.3%	15.8%	7.0%	0.2%	0.4%	0.1%	100.0%
Belgium	0.6%	3.1%	10.7%	19.4%	25.8%	18.3%	14.6%	5.9%	0.6%	0.0%	100.0%
Sum all countries	0.9%	4.9%	13.6%	21.7%	25.3%	17.4%	10.2%	4.3%	0.8%	0.2%	100.0%

Panel D: Pairwise t-tests for the differences between the mean attitude to risk scores		
Country pair	***t*-Test statistic**	***p*-Value**
France—UK	−1.787	0.002
Germany—UK	−0.540	0.821
Italy—UK	−2.972	0.000
Spain—UK	−4.112	0.000
Belgium—UK	−0.029	1.000
Germany—France	1.247	0.067
Italy—France	−1.185	0.091
Spain—France	−2.326	0.000
Belgium—France	1.758	0.048
Italy—Germany	−2.432	0.000
Spain—Germany	−3.572	0.000
Belgium—Germany	0.511	0.954
Spain—Italy	−1.141	0.064
Belgium—Italy	2.942	0.000
Belgium—Spain	4.084	0.000

Note: This table presents attitude to risk scores across all six European countries. In Panel A, summary scores in terms of means and standard deviations are provided where minimum scores are 1 and maximum 10. Panel B includes the distribution of the number of respondents across the 10 risk profiles whereas Panel C presents the same information but in percentage format. Panel D includes *t*-test results (*t*-test statistic and *p*-value) for all pairwise comparisons.

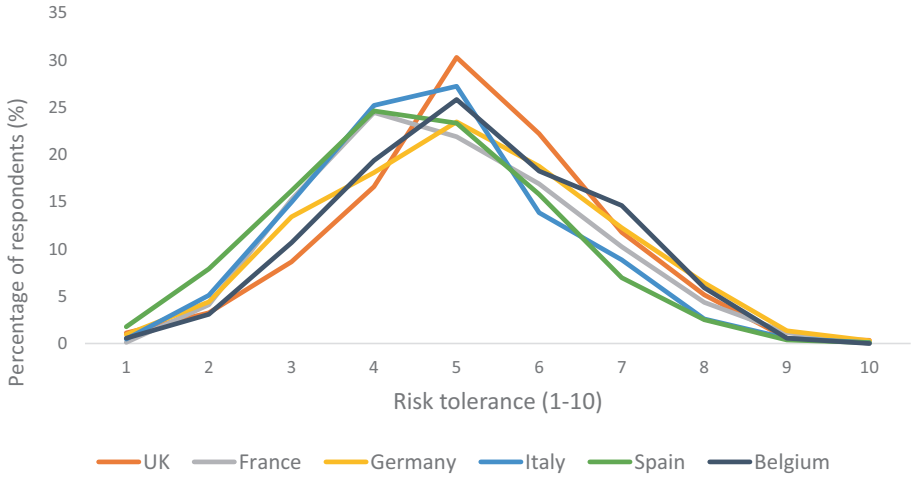

FIGURE 1 Cross-country comparison of the distribution of attitude to risk scores. This figure shows distributions of risk tolerance scores (1–10) for each of the six European countries. All countries have the expected 'bell-shape' curve with a large proportion of respondents for each country within the range of risk profile 4–6. [Colour figure can be viewed at wileyonlinelibrary.com]

summary findings accord with the limited existing evidence on the topic, such as that by Linciano and Soccorso (2012), who suggest that financial knowledge is typically fairly low in Italy.

Table 2 displays the distribution of attitude to risk scores for each country—with the mean and median scores for each country in Panel A, numbers of respondents in each category in Panel B and percentages within that country in Panel C. The mean risk tolerance scores are highest in the United Kingdom (5.17) and Belgium (5.15), while they are considerably lower in Italy (4.69) and especially Spain (4.51). The standard deviation of scores within countries is very similar (1.5–1.6 in all cases). Panel A also shows that the median score is 5 in all countries except Spain where it is 4.

From Panels B and C of Table 2, it is evident that there is similarly broad profile across countries, with very few respondents in the very bottom or top categories. In particular, only 1%–2% fall in the 9–10 categories, with none at all at 10 in France or Belgium and just one in each of Italy and Spain. Spain similarly has virtually no respondents with a risk score of 8. Equally, France and Belgium have just one and two respondents respectively with attitude to risk scores of 1. The majority of respondents fall within the 5–6 categories in the United Kingdom, Germany and Belgium, whereas for France, Italy and Spain it is 4–5.

The final panel of Table 2 presents the results from a sequence of pairwise comparisons of the mean attitude to risk scores across countries; *t*-test statistics and *p*-values are presented in each case. Perhaps unsurprisingly given the findings in the previous panels of this table, the results reveal statistically significant differences between the average risk tolerance scores in all other countries except Belgium and Germany versus the United Kingdom. The average risk tolerances are also significantly different between Belgium and all the other sample countries except Germany and between all other pairwise comparisons (France vs. Italy, Germany vs. France and Spain vs. Italy at the 10% level).

In order to further examine the variation in risk profiles across nations, Figure 1 plots the distributions of attitude to risk scores (1–10 scale) with each European country represented by a separate line. The profiles for all six countries have the expected approximate 'bell-shape' with the bulk of respondents in the 4–6 range in each case. Interestingly, the higher average risk tolerance in the United Kingdom than other countries is not because it has more respondents at the top end (scores of 7–10), but rather because more of its participants are in the 5–7 range than is the case for other countries, and fewer from 2 to 4. Germany and Belgium (and even France) have a greater proportion than the United Kingdom of very risk tolerant individuals with scores of 9 or 10.

3.3 | Models for data analysis

Our primary analysis involves conducting regressions to explain the cross-sectional variation in attitude to risk. Since the risk tolerance measure that we employ is constructed on a 1–10 scale and can only take one of these integer values for each survey participant, we employ ordered probit models with this as the dependent variable. We estimate two sets of models: the first pools observations across all six nations and incorporates country fixed effects alongside a wide range of control variables identified in the existing literature to affect attitude to risk discussed below. The second set of models constructs individual specifications for each of the six countries separately. The latter models allow not only the average level of risk tolerance to vary between countries, but also the relationship between risk attitude and the non-country explanatory variables. This enables us to determine whether the various factors have the same

degrees of importance in all sample nations, or there are instead discernible cross-country variations.

3.4 | Other explanatory variables

3.4.1 | Age

The majority of the large number of extant studies that employed age as a determinant of risk tolerance have found a negative link (e.g., Brooks, Sangiorgi, et al., 2018; Hallahan et al., 2004), although there is evidence that the relationship is not linear (Faff et al., 2009). Bucciol and Miniaci (2011) use data from the US Survey of Consumer Finances and find that the risk embodied in investors' portfolios is roughly constant from the ages of 40 to 60 before declining thereafter. Dohmen et al. (2011) employ German household survey data and find again that risk tolerance declines with age. The proportion of risky assets that investors hold in their portfolios also declines as age increases (Jianakoplos & Bernasek, 2006).

3.4.2 | Gender

A long line of studies has argued that men are more risk tolerant than women across a range of domains including financial decision-making. For instance, Fellner and Maciejovsky (2007) conduct sophisticated experiments where participants choose between lotteries, finding that women trade less and adopt more risk averse strategies. On the other hand, there are also studies suggesting either that gender differences in financial risk preferences are non-existent (e.g., Keller & Siegrist, 2006; Schubert et al., 1999), or that a more nuanced conclusion is required. For instance, Badunenko et al. (2009) find that while women have a lower tendency to select risky assets, after conditioning on the decision to purchase risky assets, the proportion of wealth allocated to them is consistent across genders. There is also evidence, however, that investment experience (Brooks et al., 2019) and knowledge (Gysler et al., 2002) are essential mediating factors, and adequately controlling for these significantly diminishes the gender gap in financial choices.

3.4.3 | Income and wealth

A range of prior studies have documented that investors with higher incomes or greater wealth tend to be more risk tolerant (e.g., Bucciol & Miniaci, 2011; Chang et al., 2004; Grable & Joo, 2004).

3.4.4 | Marital status

Single people tend to be willing to take more risks while married people, who may have dependents and greater financial responsibilities to shoulder, are typically less risk tolerant (Grable & Joo, 2004). However, it is important to account for age and the typical phase in their life cycle when people have a particular marital status (see Brooks, Sangiorgi, et al., 2018). There is also evidence that marriage acts as a mediator to the financial risk attitudes of each spouse (Gilliam et al., 2010) so that the partner's risk tolerances converge.

3.4.5 | Financial education

There is considerable evidence that financial risk tolerance increases with the general level of education (Grable, 2000; Grable & Joo, 2004; Sung & Hanna, 1996). However, the number of studies investigating the impact of financial knowledge specifically is much more limited. For instance, Salas-Velasco et al. (2021) compare the effectiveness of financial education across a range of European countries, while Prasad et al. (2021) show that financial literacy affects investment choices among Indian retail investors. Focusing on risk tolerance specifically, existing research has predictably found that greater investment knowledge is correlated with greater willingness to take financial risks (e.g., Brooks et al., 2022), although it is perhaps unclear which is the cause and which the effect.

3.4.6 | Investment experience

There is evidence that financial literacy improves rapidly with investment experience and that it is socially contagious (Li & Meyer-Cirkel, 2021). The process of having held risky financial assets in the past appears in general to sensitise investors to the experience, so that their tolerance of such risks is higher than otherwise comparable investors who have not done so before (Weber et al., 2005).

3.4.7 | Previous receipt of professional financial advice

Existing research on the impact of receiving financial advice on risk tolerance is mixed. We might expect that receiving advice would encourage risk-taking, since advisors would be on-hand to provide continuing support to their clients during periods of market turbulence. To this

TABLE 3 Ordered logit models to explain the cross-sectional variation in attitude to risk with country effects.

	Dependent variable: Risk tolerance score (1–10)				
	(1)	(2)	(3)	(4)	(5)
Gender = Male	0.955*** (0.053)			0.607*** (0.055)	0.620*** (0.054)
Gender = Other	−0.637** (0.209)			−0.400^{+} (0.210)	−0.417* (0.209)
Age = 25–34	−0.149* (0.072)			−0.066 (0.074)	−0.121^{+} (0.065)
Age = 35–44	−0.356*** (0.102)			−0.277** (0.104)	−0.420*** (0.090)
Age = 45–54	−0.573*** (0.128)			−0.577*** (0.132)	−0.755*** (0.116)
Age = 55–64	−0.630*** (0.153)			−0.792*** (0.160)	−1.016*** (0.139)
Age = 65–74	−0.471^{+} (0.255)			−0.600* (0.264)	−1.032*** (0.173)
Age = 75+	−0.764* (0.366)			−1.066** (0.380)	−1.502*** (0.296)
Divorced	0.248 (0.179)			0.044 (0.181)	
Married	−0.103 (0.080)			−0.241** (0.081)	
Separated	−0.075 (0.264)			−0.031 (0.274)	
Widowed	0.542 (0.360)			0.414 (0.368)	
A levels or equivalent	0.058 (0.114)			0.077 (0.117)	
Degree	0.171 (0.113)			0.114 (0.117)	
Higher degree	0.089 (0.120)			0.082 (0.126)	
Full-time employment	0.132 (0.228)			0.409^{+} (0.233)	
Houseperson	−0.041 (0.284)			0.110 (0.290)	
Part-time employment	0.053 (0.231)			0.316 (0.235)	
Semi-retired	0.242 (0.389)			0.566 (0.410)	
Student	−0.016 (0.236)			0.402^{+} (0.241)	
Unemployed	−0.229 (0.244)			0.252 (0.249)	
Salary = 10,000–19,999	0.147^{+} (0.078)			0.074 (0.079)	0.079 (0.075)
Salary = 20,000–29,999	0.171^{+} (0.094)			−0.010 (0.095)	0.010 (0.084)
Salary = 30,000–49,999	0.700*** (0.101)			0.299** (0.103)	0.313*** (0.089)

TABLE 3 (Continued)

	Dependent variable: Risk tolerance score (1–10)				
	(1)	(2)	(3)	(4)	(5)
Salary = 50,000–69,999	0.887*** (0.139)			0.432** (0.142)	0.439*** (0.129)
Salary = 70,000+	1.219*** (0.176)			0.589** (0.182)	0.586*** (0.172)
Wealth = 10,000–49,999	0.366*** (0.062)			0.117^{+} (0.064)	0.103 (0.063)
Wealth = 50,000–99,999	0.474*** (0.096)			0.037 (0.098)	0.016 (0.097)
Wealth = 100,000–199,999	0.572*** (0.118)			0.225^{+} (0.120)	0.186 (0.118)
Wealth = 200,000–299,999	0.607*** (0.177)			0.264 (0.177)	0.210 (0.176)
Wealth = 300,000+	0.911*** (0.156)			0.454** (0.160)	0.404* (0.158)
Experience_advisor = Yes, currently		−0.190* (0.093)		−0.137 (0.102)	
Experience_advisor = Yes, in the past		−0.129* (0.060)		−0.097 (0.064)	
Knowledge_investing		0.680*** (0.026)		0.660*** (0.028)	0.652*** (0.027)
Experience_investing = yes		0.883*** (0.063)		0.791*** (0.065)	0.786*** (0.065)
Country = France			−0.384*** (0.087)	−0.400*** (0.105)	−0.330** (0.100)
Country = Germany			−0.137^{+} (0.081)	−0.223* (0.098)	−0.153 (0.096)
Country = Italy			−0.570*** (0.079)	−0.253* (0.099)	−0.192* (0.096)
Country = Spain			−0.758*** (0.080)	−1.005*** (0.097)	−0.931*** (0.094)
Country = Belgium			−0.037 (0.111)	−0.265* (0.124)	−0.173 (0.122)
Observations	5195	5195	5195	5195	5195
R^2	0.156	0.288	0.026	0.350	0.346
chi^2	860.411*** ($df = 31$)	1712.600*** ($df = 4$)	133.982*** ($df = 5$)	2170.413*** ($df = 40$)	2142.787*** ($df = 25$)

Note: This table reports the results of logit regressions estimated with robust standard errors in parentheses. *Risk tolerance* is measured on a scale from 1 to 10. *Gender* is a binary variable which equals one if the respondent is male and zero if female. *Age* is measured using seven categories ranging from 18 to more than 75 years where 18–24 is the reference level. *Marital status* is measured in five categories, and single is the reference level. *Education* is measured using four categories ranging from school leaver to higher degree, where school leaver is the reference level. *Occupation* is categorised into seven groups, retired is the reference level. *Salary* is measured in five categories ranging from less than £10,000 to more than £70,000, less than £10,000 is the reference level. *Wealth* is categorised into five groups ranging from £10,000 or less to more than £300,000, where less than £10,000 is the reference level. *Experience with an advisor* is categorised into three groups, yes (currently), yes (in the past) and none, none is the reference level. *Investment knowledge* is measure on a scale of 1 to 5. *Investing experience* is a binary variable which equals one if the respondent has experience and zero if they do not. Finally, *country* is separated into six for each European country with UK as the reference level. *, ** and *** indicate significance at the 5%, 1% and 0.1% levels, respectively.

end, Bernasek and Shwiff (2001) find that clients on average increase the riskiness of their pension portfolios following the receipt of financial advice, but on the other hand, the survey results of Van de Venter et al. (2012) show that investors *increase* their risk tolerance after parting company with their former financial planner.

4 | RESULTS

Table 3 presents the results from estimating ordered logit models to explain the cross-sectional variation in attitude to risk scores using a pooled sample comprising all six countries. Five separate specifications are estimated, in columns labelled (1)–(5), all of which have the attitude to risk score (1–10 scale) as the dependent variable. Specification (1) includes only demographic information; (2) includes only the investment experience and experience with an advisor dummy variables plus the investment knowledge variable (Likert scale); (3) includes only the country fixed effects; (4) is the most comprehensive specification including all of the explanatory variables available to us; (5) retains only the significant predictors found in model 4. The reference categories for the dummy variables are gender = female; age = 18–24; marital status = single; education = school-leaver; employment = self-employed; salary = <10,000; wealth = <10,000; experience with advisor = none; experience of investing = no; country = UK.

The results in model (1) broadly confirm the established findings from the literature presented above. Men are significantly more risk tolerant than women, and risk tolerance declines with age, particularly for respondents over 45 years old, although the relationship between risk attitude and age is not quite monotonic. None of marital status, educational attainment or employment type have any significant effect on risk tolerance. But as anticipated, risk tolerance is increasing with levels of income and wealth, almost monotonically in both cases.

Model (2) of Table 3 presents the results for experience with an advisor and investment knowledge and

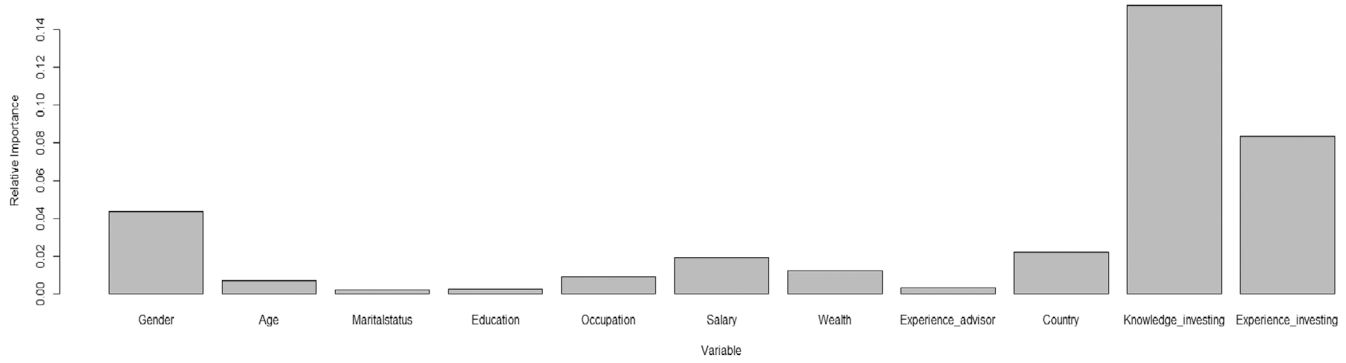

FIGURE 2 Shapley-Owen decomposition of variables to explain attitude to risk. This figure presents the results of a relative importance analysis that identifies the percentage contribution of each independent variable and variable category. The estimated model is an OLS with robust standard errors. This analysis is based on the variables present in model 4 of Table 3. The overall proportion of variance explained by the model is 35.85.

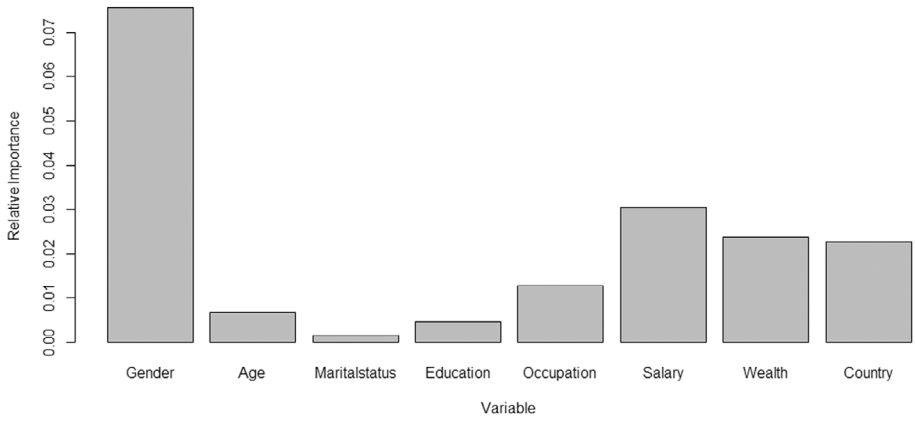

FIGURE 3 Shapley-Owen decomposition of variables to explain attitude to risk excluding investment knowledge and experience. This figure presents the results of a relative importance analysis that identifies the percentage contribution of each independent variable and variable category. The estimated model is an OLS with robust standard errors. Two key variables (investment experience and knowledge) are removed in relation to Figure 2 so that the relative differences between the remaining factors is easier to discern. The overall proportion of variance explained by the model is 17.8.

TABLE 4 Separate ordered probit models for each country to explain the cross-sectional variation in attitude to risk.

	Dependent variable: Risk tolerance score (1–10)					
	UK	**France**	**Germany**	**Italy**	**Spain**	**Belgium**
Gender = Male	0.473***	0.512***	1.039***	0.478***	0.389**	0.787***
	(0.139)	(0.144)	(0.132)	(0.120)	(0.119)	(0.234)
Gender = Other	−0.602	0.290	−0.091	−0.542	−0.754^{+}	0.072
	(1.291)	(0.472)	(0.449)	(0.427)	(0.413)	(0.865)
Age = 25–34	0.537^{+}	−0.066	−0.001	−0.395**	−0.091	0.303
	(0.284)	(0.204)	(0.168)	(0.143)	(0.166)	(0.321)
Age = 35–44	0.424	−0.190	−0.494*	−0.648**	−0.278	−0.467
	(0.298)	(0.291)	(0.246)	(0.247)	(0.225)	(0.473)
Age = 45–54	0.124	−0.301	−0.932*	−0.856*	−0.844**	−0.657
	(0.309)	(0.393)	(0.366)	(0.355)	(0.294)	(0.693)
Age = 55+	0.105	−1.878**	−0.823	−1.408**	−0.986*	0.205
	(0.317)	(0.643)	(0.517)	(0.532)	(0.389)	(1.214)
Divorced	0.165	0.523	−0.965^{+}	−0.473	−0.00001	−0.286
	(0.267)	(0.648)	(0.568)	(0.612)	(0.548)	(0.723)
Married	−0.489**	−0.231	−0.315	−0.438^{+}	0.056	0.231
	(0.161)	(0.217)	(0.201)	(0.224)	(0.188)	(0.360)
Separated	−0.248	−0.557	0.770	0.058	0.333	0.530
	(0.393)	(0.970)	(2.416)	(0.720)	(0.639)	(2.806)
Widowed	0.034	0.723		0.508	2.649^{+}	−1.423
	(0.429)	(1.593)		(1.637)	(1.465)	(1.608)
A levels or equivalent	0.260	0.653	0.019	−0.003	−0.015	−0.729
	(0.190)	(0.854)	(0.225)	(0.444)	(0.309)	(1.552)
Degree	0.298	0.490	−0.027	0.045	−0.006	−0.447
	(0.190)	(0.846)	(0.237)	(0.450)	(0.308)	(1.544)
Higher degree	0.408^{+}	0.100	0.237	0.410	−0.319	−0.729
	(0.227)	(0.850)	(0.254)	(0.466)	(0.325)	(1.559)
Retired	−1.107**	0.008	0.768	−0.905	1.107	
	(0.428)	(1.119)	(0.628)	(1.093)	(0.915)	
Full-time employment	−0.378	−0.378	0.261	−0.029	0.014	−0.067
	(0.385)	(0.262)	(0.208)	(0.194)	(0.214)	(0.509)
Houseperson	−1.054*	−0.120	−0.420	−0.175	0.748	−0.624
	(0.465)	(0.956)	(0.499)	(0.787)	(0.502)	(1.611)
Part-time employment	−0.653	−0.671*	0.325	−0.286	0.015	−0.405
	(0.400)	(0.313)	(0.210)	(0.184)	(0.205)	(0.707)
Semi-retired	−0.440	0.933	0.863		1.878	
	(0.621)	(1.479)	(1.393)		(1.348)	
Unemployed	−0.799^{+}	−0.024	0.438	−0.238	−0.288	
	(0.457)	(0.254)	(0.302)	(0.198)	(0.219)	
Salary = 10,000–19,999	0.371	0.529*	0.065	−0.169	−0.069	−0.004
	(0.234)	(0.235)	(0.164)	(0.168)	(0.175)	(0.525)
Salary = 20,000–29,999	0.0002	0.196	−0.365	0.056	0.232	−0.454
	(0.236)	(0.283)	(0.248)	(0.199)	(0.224)	(0.523)
Salary = 30,000–49,999	0.255	0.980**	0.062	0.150	0.548*	−0.182
	(0.244)	(0.313)	(0.258)	(0.237)	(0.257)	(0.525)
Salary = 50,000–69,999	0.592^{+}	0.692^{+}	0.153	0.027	0.399	0.227
	(0.307)	(0.403)	(0.316)	(0.411)	(0.486)	(0.742)
Salary = 70,000+	0.621	1.563**	−0.076	0.329	1.079*	0.741
	(0.384)	(0.543)	(0.375)	(0.601)	(0.525)	(0.850)

(Continues)

TABLE 4 (Continued)

	Dependent variable: Risk tolerance score (1–10)					
	UK	**France**	**Germany**	**Italy**	**Spain**	**Belgium**
Wealth = 10,000–49,999	0.036 (0.169)	0.047 (0.167)	0.337* (0.135)	0.001 (0.146)	0.108 (0.144)	0.157 (0.262)
Wealth = 50,000–99,999	−0.179 (0.211)	0.124 (0.280)	0.582* (0.243)	−0.046 (0.241)	−0.034 (0.222)	0.420 (0.362)
Wealth = 100,000–199,999	0.198 (0.225)	0.406 (0.414)	0.900** (0.327)	0.090 (0.305)	−0.011 (0.281)	−0.065 (0.432)
Wealth = 200,000–299,999	0.087 (0.319)	0.639 (0.506)	0.809 (0.499)	0.221 (0.546)	−0.144 (0.382)	0.137 (0.805)
Wealth = 300,000+	0.642* (0.270)	0.053 (0.458)	−0.059 (0.535)	0.151 (0.496)	0.158 (0.392)	−0.075 (0.941)
Experience_advisor = Yes, currently	−0.152 (0.190)	0.512 (0.321)	−0.871*** (0.256)	0.011 (0.227)	0.157 (0.307)	0.437 (0.516)
Experience_advisor = Yes, in the past	−0.396** (0.145)	0.336^{+} (0.192)	0.002 (0.143)	−0.044 (0.141)	−0.080 (0.152)	−0.342 (0.267)
Knowledge_investing	0.865*** (0.071)	0.592*** (0.068)	0.336*** (0.055)	0.850*** (0.072)	0.636*** (0.060)	0.868*** (0.114)
Experience_investing = yes	0.263^{+} (0.144)	1.374*** (0.203)	1.151*** (0.143)	0.626*** (0.156)	0.807*** (0.146)	0.522* (0.265)
Observations R^2	891 0.379	772 0.406	1038 0.355	1071 0.328	1071 0.331	342 0.427
chi^2	409.836*** (df = 33)	388.848*** (df = 33)	442.619*** (df = 32)	410.709*** (df = 32)	418.296*** (df = 33)	183.895*** (df = 30)

Note: This table reports the results of logit regressions estimated with robust standard errors in parentheses. *Risk tolerance* is measured on a scale from 1 to 10. *Gender* is a binary variable which equals one if the respondent is male and zero if female. *Age* is measured using seven categories ranging from 18 to more than 75 years where 18–24 is the reference level. *Marital status* is measured in five categories, and single is the reference level. *Education* is measured using four categories ranging from school leaver to higher degree, where school leaver is the reference level. *Occupation* is categorised into seven groups, retired is the reference level. *Salary* is measured in five categories ranging from less than £10,000 to more than £70,000, less than £10,000 is the reference level. *Wealth* is categorised into five groups ranging from £10,000 or less to more than £300,000, where less than £10,000 is the reference level. *Experience with an advisor* is categorised into three groups, yes (currently), yes (in the past) and none, none is the reference level. *Investment knowledge* is measure on a scale of 1–5. *Investing experience* is a binary variable which equals one if the respondent has experience and zero if they do not. *, ** and *** indicate significance at the 5%, 1% and 0.1% levels, respectively.

experience as the only explanatory variables. Perhaps surprisingly, having accessed financial advice—either currently or in the past—has a negative and marginally significant effect on risk tolerance. Although we are unable to test this conjecture directly, a plausible reason why having previously accessed financial advice has a slight negative influence on risk tolerance is that investors who are lacking financial confidence and wish to avoid risks might elect to use an advisor to make financial decisions for them as a 'safety net' while those who are more comfortable taking risks would make investments directly themselves. But having greater knowledge of investing or experience of investing (both self-assessed) have large, significant positive impacts on risk tolerance.

Specification (3) of Table 3 includes the country fixed effects only, confirming the univariate analysis reported in Table 2. Compared with the United Kingdom, all other countries have lower average risk tolerance scores, with France, Italy and especially Spain significantly so. Model (4) in the table includes both the country dummies and all of the demographics, therefore combining the variables included separately in (1)–(3). We find that including the country effects in the model somewhat diminishes the parameter sizes on the gender, income and wealth variables compared to the corresponding values in column (1). Looking from a different perspective, when we allow for differences in the demographic make-up of the respondents and their characteristics across nations, the country fixed effects still remain significant, but the sizes of the parameters vary in some cases. Comparing columns (3) and (4), the negative coefficient on Italy is halved while that on Spain increases from 0.76 to 1.00 and in Belgium it becomes more negative, moving from −0.04 to −0.26.

The final column (5) in Table 3 reports other combinations of the independent variables: including only the empirically most important variables from the previous columns in (4), which at the margin reduces the standard errors and therefore increases significance levels but the main findings from the previous columns remain unaltered. Overall, we can conclude from this table that there are statistically significant differences between the risk tolerances of UK retail investors compared with their European counterparts that mostly cannot be explained by differences in their individual characteristics. However, it is worth emphasising that this statistical significance belies a lack of economic relevance of cross-county differences in most cases. Even focusing on the most extreme case (Spain), in column (5), average risk tolerance scores are less than one unit lower (on a 1–10 scale) than those of the reference category (the United Kingdom). Moreover, the differences between the estimates for Germany, Italy and Belgium are all less than 0.2. This contrasts considerably with the economic importance of investment knowledge as an explanatory factor for the cross-sectional variation in attitude to risk scores. Pooling all of the observations from the six countries and sorting them by investment knowledge, the lowest quintile of investment knowledge has a mean attitude to risk score of 3.9 (median = 4) while the highest has a mean ATR score of 5.9 (median 6), a difference of two full units (on a 1–10 scale).

It is clear from the summary statistics above that there are variations in the demographic make-up of the samples across countries, and in particular, the UK subsample contains a higher proportion of older respondents. In order to examine the impact that this may have on the findings, we rerun the regressions after limiting the responses from all countries to only people under 45 years old. The number of respondents for each country is: UK: 402; France: 726; Germany: 987; Italy: 1025; Spain: 955; Belgium: 341. This is now a much more homogeneous sample, but reassuringly, the results (that we do not present due to space constraints) are not qualitatively altered compared with those presented in Table 3. We can conclude that sample-specific differences in the demographics of respondents across countries are not driving the results.

The control variables relating to educational attainment, marital status and occupation are mostly insignificant in specifications (1) and (4) of Table 3. A plausible explanation for the lack of significance of these variables is that the other controls included in the models are correlated with them but capture the variation in risk tolerance over investors' lifecycles better – specifically, age and investment experience are linked with marital status (younger and less experienced investors are more likely to be single) while occupation is linked with salary and wealth.

The bottom panel of the table reports the number of observations, the pseudo-R^2 and a test for the joint significance of all the explanatory variables in each model. Regarding the R^2, the figures are quite respectable given that explaining the cross-sectional variation in risk tolerance is a highly challenging problem with a considerable amount of heterogeneity that is hard to explain with currently known factors (Guiso & Paiella, 2008). The R^2 values do demonstrate, however, the inadequacy of using country effects alone, highlighting the explanatory power of other factors.

Examining further the relative importance of each group of variables, Figures 2 and 3 display the results from Shapley-Owen decompositions of the total amount of variance explained from a full specification such as model (4) in Table 3. Figure 2 includes all variable groups, and shows the explanatory power of investment knowledge and experience, which together account for around a quarter of all of the explained variation. Gender is also an important factor, accounting for around 5% of the explained variation. On the other hand, age, marital status, education level, occupation, salary and wealth each cover less than 2% of the explained variation. Most relevant for our study, when combined into a specification containing all of these other factors, the impact of country effects is very modest: only around 2% of the explained variation.

Figure 3 presents a sub-set of the information in Figure 2 where two key variables (investment experience and knowledge) are removed so that the relative differences between the remaining factors is easier to discern. This figure makes the low ranking of the country fixed effects in explaining the cross-sectional variation in risk attitudes easier to see: as a variable it is dominated by gender (which has three times the explanatory power), salary and wealth.

In order to allow the relationships between the explanatory variables and attitude to financial risk to vary across countries, Table 4 incorporates the same independent variables as those in Table 3, but the models are estimated separately for each country. Naturally, therefore, there are no country effects. Also, some categories have zero observations for particular nations—for instance, there are no widowed respondents in Germany, and no retired, semi-retired or unemployed respondents in Belgium. Therefore, the parameters on those specific variables cannot be estimated for those countries.

The most salient result in Table 4 is the degree of similarity across countries in the significances and signs of the parameter estimates, particularly given that the samples are entirely independent. Men are significantly more risk tolerant than women in every country, but especially in Germany and Belgium, while risk tolerance falls with age

in every country except the United Kingdom and to a lesser extent Belgium. Neither marital status nor educational attainment nor employment status has explanatory power except for the latter group within the United Kingdom, where respondents who are retired or house persons have significantly lower average risk tolerances. Risk tolerance is increasing in salary and wealth in every individual country except Belgium, and not significantly so in Italy or Spain. Knowledge and experience of investing are both important predictors for all countries. Finally, the goodness of fit as measured by the pseudo-R^2 is very similar across all countries, ranging from around 0.3 to 0.4.

In order to further examine the differences across European countries presented in Figure 1, a chi-squared test was conducted comparing distributions across all the risk profiles within the six countries. The relation between these variables was significant, χ^2 (6, $N = 5231$) $= -3.34$, $p < 0.001$. Regarding the more risk averse countries, we find more Spanish respondents fall into risk profile 1 and 2 with fewer in risk profile 7 than would be expected if all country distributions were the same, and fewer Italians were classified as a risk profile 6. On the other hand, fewer UK respondents are a risk profile 3 and 4, but more a risk profile 5 and 6, whilst more German respondents were categorised as a risk profile 8 than expected if all country distributions were equal. There appears to be no significant differences between countries across risk profiles 9 and 10.

5 | DISCUSSION, CONCLUSIONS AND IMPLICATIONS

There is a lack of research exploring the impact of nationality and culture on attitudes towards financial risk, particularly within Europe (Kolnhofer-Derecskei, 2018). The present paper has attempted to address this lacuna by comprehensively examining the factors that affect attitudes to financial risk across six European countries. Our main findings are first, the importance of gender and investment knowledge and experience as explanatory variables for risk tolerance, with these three each dwarfing country-specific effects. However, significant differences in risk preferences are nonetheless apparent when comparing the United Kingdom with France, Italy and Spain which could be explained by country differences in uncertainty avoidance as the United Kingdom have been found to have low levels. However, although Belgium has a high level of uncertainty avoidance (Kang & Kim, 2019), no significant differences in attitudes to financial risk with the United Kingdom were observed.

Perhaps our finding of similar distributions of risk profiles across countries should not be viewed as surprising: many psychologists believe risk attitude to be genetically predisposed (e.g., Cesarini et al., 2009), and as such we might anticipate that local variations in economic conditions would not significantly alter the distribution of risk profiles across countries. However, this does not imply that investment choices will be equally similar: even if innate risk preferences are similar across European countries, people's financial choices might still differ due to variations in subjective evaluations of the risks and expected returns of the various asset classes (see Nosić & Weber, 2010), as well as differences in the types of financial products available. A further complicating factor in disentangling risk appetite from risk perceptions is the challenge in modelling the latter and that the way investors evaluate risk might not align with the standard approaches, such as standard deviations or value at risk, employed by finance scholars.

In certain existing studies, such as Bontempo et al. (1997), cultural differences trumped income and occupational differences in explaining risk perceptions. But considering this the other way around, we could interpret our findings as being consistent with such studies in that we present evidence that culturally similar groups of retail investors hold similar typical risk appetites despite language and other differences. This ties in with the notion expressed in prior studies that risk preferences within a domain are deep-seated psychological traits that vary little over time. Bucciol and Zarri (2015) show that among many significant life events covered by the survey data they examine, only the death of a child or a natural disaster were sufficiently salient to cause a shift in financial risk preferences, whereas job loss, being a victim of theft or suffering a serious illness appeared to make no difference.

Hsee and Weber (1999, p. 176) note that it is not possible to unambiguously attribute cross-country differences in choices or outcomes to specific cultural variations because of a myriad of confounding factors. Equally, our results that there are at best modest cross-country differences in investment risk preferences should not be interpreted as implying that cultural variations are absent or unimportant as they could nonetheless be present but cancelling each other out in some senses.

One way to reconcile our result that financial risk tolerance is remarkably uniform across countries with those of existing studies that observed significant variations within a country over time is that the latter have conflated innate attitude to risk with investors' subjective perceptions of the levels of risks and returns offered by each asset class, as Roszkowski and Davey (2010) had suggested. In particular, it is possible that a change in those perceptions whereby the expected returns are reduced, or their risks heightened, would lead to a decline in risky investing even if appetite for risk

remained the same. For instance, Weber and Milliman (1997) argue that risk preferences are stable personality traits once situation-specific effects are controlled for. Weber and Hsee (1998) show that cross-country differences in willingness to pay for financial options was primarily due to variations in how risky the options were perceived to be rather than differences in risk tolerances. Similarly, the primary reason why some people are willing to become entrepreneurs while others are not, is due to the former's more optimistic projections of the likely outcomes from risky decisions rather than inherent differences in preferences for taking risk (Brockhaus, 1982).

Although it cannot be tested directly, it is plausible that countries where the recent performance of risky asset portfolios had been stronger might display more positive attitudes towards future risk-taking at the margin. There is evidence supporting this conjecture at the individual level, where higher risk tolerance arose for retail investors whose previous stock holdings had performed well (Malmendier & Nagel, 2011), and for professional investors, who were found in an experimental setting to be more risk tolerant when they experienced a market boom rather than bust (Cohn et al., 2015).

Weber and Klement (2018) argue that changing subjective interpretations of the risk and returns of risky assets can make it appear as if an individual's risk tolerance has changed over time. Our findings suggest that the same logic applies in cross-section: the use of an inappropriately designed instrument could identify spurious cross-country differences in risk appetites. In reality, however, while there might be substantial variations in the way investors in different European countries perceive each asset class, their innate risk preferences are remarkably similar.

5.1 | Policy and practical implications

Turning now to the implications of our findings for policymakers, our key finding that risk tolerance is heavily dependent on financial knowledge would suggest that a push towards improving investment education would be a route to encouraging people to take greater control of their finances. This could entice them to entertain investment in risky products that are likely to be more suitable for long-term wealth accumulation than savings, particularly in countries where the rates of such investment are low. However, achieving better educational outcomes is likely to be very challenging, with considerable evidence that it would need to begin at an early age, therefore taking at least a generation to achieve. Doubts have been expressed about the effectiveness of financial education in improving investment literacy (Benartzi & Thaler, 2007), and people are often not keen to enhance their financial knowledge even given opportunities (Van Rooij et al., 2007).

It is also clear that the low returns available on the sorts of guaranteed savings products that are prevalent across many countries in continental Europe suggests that retail investors there may need to rethink their investment strategies to have any chance of securing reasonable retirement savings. But on the other hand, relatively small domestic stock markets will also require them to eliminate any home biases in their investment choices, and to diversify internationally. If financial education is not a viable route to achieving these objectives, a greater role for financial advisors might be the solution. Governments and regulators should ensure that the supply of financial advisors is sufficient, and that an environment is established where they are trusted to provide worthwhile and good value advice.

A final implication of our findings for financial product providers is that investment in equities and other higher risk securities could become almost as common in France, Italy, and other European countries as it is in the UK if its risk-return characteristics become more widely appreciated. In the same vein, given that we find the distribution of risk profiles is remarkably stable across comparable countries, the same processes and products could be adopted in each case without the need for market-specific investment propositions.

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DATA AVAILABILITY STATEMENT

The data are commercially sensitive and a guarantee was offered to survey participants that their responses would only be used for the survey and only available to the researchers. These issues mean that the data cannot be made available.

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