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## **Research Technical Paper**

# **An analysis of the determinants of risk attitudes in Ireland and the United Kingdom\***

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## **Abstract**

In this paper we avail of new data in studies of financial capability conducted separately in the United Kingdom and Ireland to model the determinants of individuals' attitudes to risk. These risk attitudes are explored explicitly in the context of savings and investments and are modelled on the basis of socio-economic characteristics such as age, gender, region of residence and educational attainment. Furthermore, we explore the relatively complex relationship between risk attitudes and proxies of individual's wealth levels in the context of potential *reverse causation*.

JEL classification: D81, C81, D14.

Keywords: Risk, Wealth, Investment.

## **Non Technical Summary**

Attitudes to risk have significant implications for economic decisions made across the entire economy. Ongoing changes in employment conditions have led to individuals having to take more responsibility for their pension provision than previously. Allied to increased consumer participation in the stock market, these developments mean that individual citizens are assuming greater levels of financial independence and responsibility than before. Differences in individual risk preferences are, therefore, likely to be a major reason for differentials in the rate of future pension uptake and planning. At a macroeconomic level, the global financial turmoil experienced since the summer of 2007 has placed renewed emphasis on estimating aggregate risk premia levels across different countries. Therefore, it can be argued that achieving an understanding of the likely determinants of risk attitudes amongst the general population has never been of a greater policy concern.

Due to the lack of relevant data, there are few international studies of determinants of individual risk attitudes. This paper makes use of a specific question on risk attitudes to savings and investments in new data from surveys of financial capability conducted separately in Ireland and the United Kingdom to examine the impact of socio-economic factors on individual risk attitudes. The two-country approach serves as a useful control measure. The results are quite similar in both countries. People from ethnic backgrounds appear to be more risk averse, while married people and males seem to have a significant preference for risk. It would, also, appear that the greater the degree of population density, the greater the preference for risk. From a policy perspective, it appears that improving educational attainment within the population can increase peoples preferences for risk.

The relationship between risk attitudes and proxies of individuals wealth levels is also addressed and issues of causation between these variables are explored. The results in this regard suggest that behavioural characteristics revealed by risk preferences are a significant determinant of an individuals ability to accumulate wealth.

## 1. Introduction

Attitudes to risk have significant implications for economic decisions made across the entire economy. While standard consumption and investment decisions have always been significantly influenced by risk attitudes, increased consumer participation in the stock market along with changes in employment conditions means that individual citizens are assuming greater levels of financial independence with associated responsibility for investment decisions. Traditionally, for example, pensions have been provided and organised by employers, however, increasingly, the responsibility for pension provision is resting with individual workers themselves. Differences in individual risk preferences are, therefore, likely to be a major reason for differentials in the rate of future pension uptake and planning.

At a macroeconomic level, the global financial turmoil experienced since the summer of 2007 has placed renewed emphasis on estimating aggregate risk premia levels across different countries. The fall in estimates of these premia levels, which had occurred during the period, commonly referred to as the “great moderation” (circa 1985 - 2007), resulted in considerable investment and capital deepening within economies, however, events subsequent to this period suggest risk may well have been underpriced systematically across many countries. Therefore, it can be argued that achieving an understanding of the likely determinants of risk attitudes amongst the general population has never been of a greater policy concern.

Across countries, however, relatively few studies have sought to determine the nature of individuals risk attitudes. This can mainly be attributable to the dearth of relevant data addressing the issue. However, in this paper we avail of a specific question on risk attitudes included in a nationally representative survey conducted separately in the Republic of Ireland and the United Kingdom to examine the impact of key socio-economic factors on risk attitudes in both countries. The question on risk attitudes, is specifically in the context of savings and investments and is contained within a financial capability survey. Financial capability surveys were conducted in both Ireland and the UK by the respective financial regulators in each country and are almost identical in terms of the questions asked.<sup>1</sup> Using the information contained in the surveys presents a unique opportunity to

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<sup>1</sup>When the Irish survey was being compiled, the UK survey conducted by the UK Financial Services Authority (FSA) was used as a benchmark.

compare and contrast the likely determinants of risk attitudes across both countries. Clearly, the Republic of Ireland and the United Kingdom share a common history, long standing similarities in public and private governance structures, as well as, in recent times, the penetration of the Irish market place by leading UK retail banking and commercial outlets. This suggests the possibility of similar societal attitudes to issues such as risk. Therefore, a comparison of risk attitudes between both countries would appear to be highly appropriate.

Such a comparison also serves as a potential control in evaluating the results. Where determinants of risk have been estimated, some discussion in the literature has centered on whether survey questions, as used here, are actually a good measure of attitudes. This arises due to the absence of financial incentives associated with the responses in such surveys. Consequently, some have argued that responses concerning risk attitudes may be vulnerable to distortions caused by issues such as self-serving biases or strategic motives. A recent study by Dohmen et al. (2009) is significant in this regard. Examining a large nationally representative survey of German risk attitudes, the authors “cross-check” their results with those from a smaller sample using an experimental study which quantifies risk-taking behaviour with actual incentives being present. Overall, responses to a general risk question are found to be a reliable predictor of actual risky behaviour thereby lending considerable credence to survey based measures.

In a second part of the paper we examine the more complex relationship between risk attitudes and proxies of individual’s wealth levels. While, initially, we assume these indicators of wealth are determinants of risk attitudes and include them accordingly in the models of risk attitudes, it may well be the case that the behavioural information contained within individual’s risk preferences are themselves determinants of wealth levels. Therefore, in a formal context, we examine this issue as a case of potential reverse causation.

The rest of the paper is structured in the following manner; in the next section, we discuss the respective financial capability studies of the United Kingdom and Ireland, the model of risk attitudes is then presented and a subsequent section examines the effectiveness of the risk attitude measures as determinants themselves. A final section offers some concluding comments.

## 2. Financial Capability Studies

Financial capability refers to the study of a persons knowledge of financial products, their understanding of their own financial position and their ability to choose products appropriate to that position along with their ability to plan ahead financially and to seek and act on appropriate advice when necessary. Studies of financial capability were conducted in the United Kingdom and the Republic of Ireland by the respective financial regulators. The Irish survey, which was published by the Central Bank and Financial Services Authority of Ireland (CBFSAI), was carried out in late 2007 and early 2008, while the UK study, which served as the blueprint for the Irish one, was completed in 2005. Both surveys are nationally representative. The results of the UK survey are available in Atkinson et al. (2006) while O'Donnell and Keeney (2009) summarise the Irish results.

The UK study is based on a survey of approximately 5,300 households, while in the Irish case just over 1,500 households were questioned. Four domains of financial capability are covered in both questionnaires. These are as follows: managing money, planning ahead, choosing products and staying informed. The managing money domain assessed the extent to which people were able to make ends meet and keep track of their finances. The planning ahead domain considered whether people have prepared for substantial future financial commitments, in particular, the implications of retirement. Provision for unexpected events with financial implications was also assessed. The choosing products area covered choice and purchase of financial products. This covered behaviour and confidence in selecting products and focussed on products purchased in the five years preceding the survey. The staying informed section considered whether and how often respondents monitored financial topics and their behaviour in dealing with complaints, e.g., to financial services firms, where relevant.

In a comparison of the results from both countries surveys, O'Donnell (2009) notes that for several of the questions considered, the Irish and UK results are strikingly similar. An important feature of the surveys is that both countries had been experiencing broadly similar macro-economic conditions of strong economic growth in the period preceding the respective surveys and around the time the surveys were undertaken. However, there are some important differences, mainly with regard to product holdings and in particular pensions.

The question on risk attitudes is in the choosing products domain of both capability surveys and the actual question, which is asked of all the sample, is presented in Table 1 along with the responses in both countries for the different risk categories. The attitude to risk question relates specifically to savings and investments. As can be seen from the table, the results are broadly similar for both countries with a relatively high percentage of the population displaying a complete aversion to risk - 44 per cent in the case of Ireland and 43 per cent for the UK. A similar percentage of the population in both countries, at about 28 per cent, display preferences for low risk in their savings and investment strategies. In the next section we examine potential determinants of individual's risk preferences.

### 3. Determinants of Risk Attitudes

In examining individual's risk preferences, we conduct a series of regression analyses, where we model individual risk preferences as a function of various different socio-economic variables. We re-classify the eight responses to the risk attitudes question in Table 1 into a 0, 1 variable, where 0 denotes complete risk aversion or a very low risk preference and 1 represents low to moderate risk or greater. Table 2 summarises the percentage composition for these new categories. Nearly 74 per cent of the Irish sample display little appetite for any type of risk in savings and investment, while the figure for the UK is marginally lower at 72 per cent.<sup>2</sup>

In Table 3 we report the results of a binary probit regression using the risk variable, defined in Table 2, as the dependent variable. In this first model, we include, the following as independent variables; ethnicity variables, age, region of residence, marital status, gender, illness, the number of children under 18 years of age and the highest educational attainment of the individual. Estimation results are presented both for Ireland and the UK. For all variables with the exception of age and number of children under 18, the marginal effect refers to the discrete change of the dummy variable from zero to 1. Reference groups for Ireland are White-Irish, rural, Dublin for the region variables, single, female, no long-lasting illness and upper secondary education. Urban equals 1

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<sup>2</sup>By reclassifying the dependent variable in such a manner, we are able to estimate the subsequent regressions with a binary probit model. This has a number of advantages, chief of which is the ease of interpretation of the marginal effects of the independent variables.

if the respondent lives in a county where the proportion of the population in aggregate town areas is 50 per cent or greater, Urban / Rural equals 1 if that percentage is between 40 per cent and 49 per cent, while in the omitted category of rural that percentage is less than 40 per cent. For the UK, the reference groups are white-British, England, single, no long-lasting illness, female, upper secondary education, while only the significant ethnicity categories for the UK are shown.

The estimation results are interesting in that many variables appear to have the same effect across both countries - people from an ethnic background are more risk averse (significantly so in the case of the UK), married people appear to have a preference for risk as do males in both countries. The only significant difference between both countries results is that those with an illness in Ireland have a preference for risk, while those with an illness in the UK are the opposite. The UK estimate for this latter result would conform with what one would, on an intuitive basis, expect. The coefficient signs are different between both countries for the number of children under 18 years of age, however, the result is only significant in the case of the UK.

Some interesting results are obtained for the regional variables. In the case of Ireland, urban dwellers would appear to have a preference for risk as well as people living in the Munster province. For the UK, Northern Ireland, Scotland and Wales are significantly more risk averse than those living in England. This may tally with the Irish result, as population density in England would be higher than that in the other “home countries”, suggesting that those who live in a more urban setting are more favourably disposed towards risk.

The results for the educational categories across both countries are very similar. The clear result to emerge is that, once upper secondary education has been achieved, the greater the educational attainment obtained subsequent to this, the stronger the preference is for risk. Any qualification above upper secondary has a positive and significant sign, while a postgraduate degree in both Ireland and the UK has the most positive effect on risk attitudes and is highly significant. These results are interesting from a policy perspective as it indicates that risk attitudes amongst the general population can be significantly influenced by increasing access to higher levels of education.



## 4. Wealth and Attitudes to Risk

Information in both surveys is available for households' savings, borrowings (including mortgages), property values and income levels. This results in the interesting issue of whether individuals' wealth levels (as proxied by the four variables listed above) are determinants of risk attitudes or, are these attainments themselves a function of underlying behavioural characteristics revealed by individuals' attitudes to risk? In a technical sense, this gives rise to the question of reverse causation.

To address this issue, we commence by re-running the model estimated in Table 3, except in this case we include (separately) the four different wealth proxies. The results for the different models are reported in Table 4. In the interests of brevity we exclude the results for the other variables.<sup>3</sup> With the exception of the income and borrowings variables for Ireland, the results for the wealth proxies are positive and highly significant, suggesting, initially that wealth is an important determinant of risk attitudes.

In exploring the interrelationship between risk attitudes and wealth levels, previous studies by Lusardi and Mitchell (2007) and Ameriks et al (2003) are relevant. Lusardi and Mitchell (2007) examine the impact of financial literacy, where, initially, greater levels of financial planning appear to result in greater wealth accumulation. Ameriks et al measure a households 'propensity to plan' and assess the link between planning and wealth accumulation. Of particular interest in our analysis of the relationship between risk and wealth is the examination by Lusardi and Mitchell of reverse causation. They run a series of regressions where wealth is the dependent variable and planning is included as an independent regressor along with all of the other variables contained in their initial financial planning model. The significance of the planning variable can then be assessed.

We run separate regressions for wealth where the risk variable is included as an independent variable along with all of the other variables in Table 3. In Table 5 we report the results for the risk variable in each of the four different wealth models. From the table, it is apparent that, with the exception of the Irish results for borrowing and income levels, the coefficient on risk is highly significant. To further explore this issue, we also perform a series of instrumental variables regressions, where we seek to capture the exogenous variation in the different wealth proxies. This involves using an instrument, which is correlated with the wealth proxy but uncorrelated with the

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<sup>3</sup>These can be obtained, upon request, from the authors.

unobservables captured in the error term.

As an instrument we take the changes in regional house prices across the UK and Ireland as these are likely to be highly correlated with increases in household wealth but less likely to be correlated with individuals' unobservable characteristics. This correlation with wealth levels is likely to be the case for Ireland and the UK as both countries experienced substantial property price booms since the mid 1990s. From 1995 to 2007, nominal Irish house prices had increased, on average, by 15 per cent per annum. Indeed, of all the OECD countries, who experienced a property price boom during this period, Ireland's price increases were the most substantial. The United Kingdom also experienced significant house price increases during the period. For example, nominal house prices increased by nearly 200 per cent between 1995 and 2005 (the latter being the date of the UK Financial Capability Survey).

The results of the IV are presented in Table 6. In the second and fourth column, we report the significance of the instrument in the first stage regression with the equivalent wealth proxy. So, for example, in the case of savings for both Ireland and the UK, the change in house prices is significant at the 1 per cent level in predicting savings levels. In all cases, with the exception of borrowings in Ireland, the change in prices is a significant predictor of wealth levels. In the second stage regressions, where the results are in the third and fifth columns, however, it is clear that the instrumental variables results reveal that wealth levels do not positively impact on risk attitudes. In each case, the effect of wealth is either negative or positive and not significant.

Taken with the results for the risk model, this would suggest that behavioural characteristics revealed by risk preferences are a significant determinant of an individual's ability to accumulate wealth. This result would appear to conform with the finding in Lusardi and Mitchell (2007) and Ameriks et al (2003) in that wealth levels appear to be determined by behavioural characteristics revealed by either the degree of financial planning engaged upon by an individual or, in this case, an individual's attitude to risk.

## 5. Conclusions

This paper avails of information contained in two new surveys conducted in Ireland and the United Kingdom to examine the determinants of individual risk attitudes. Financial capability surveys were recently conducted in both countries, where explicit questions concerning risk attitudes in the context of investments and savings were asked. Understanding and identifying influences on risk attitudes, is increasingly important owing to the greater degree of financial responsibility experienced by ordinary citizens. Increasingly, significant investment and pension decisions, previously made at an employer or, even, at the State level, are being delegated to the individual. Heterogenous attitudes to risk are likely to be one of the major reasons for differences in these financial decisions going forward.

Comparing and contrasting the empirical estimates from the model of risk attitudes across both countries serves as a useful control, particularly given the similiarity of the underlying surveys in both cases. The results are quite similiar. People from ethnic backgrounds appear to be more risk averse, while married people and males seem to have a significant preference for risk. It would, also, appear that the greater the degree of population density, the greater the preference for risk. From a policy perspective, it is interesting to observe, that improving educational attainment within the population of both countries can increase peoples' preferences for risk.

As a final exercise, we examine the relationship between risk attitudes and different proxies for wealth contained in the surveys. We do this in the context of potential reverse causation. Strong evidence emerges in both countries to suggest that risk attitudes are a significant determinant of wealth levels.

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Table 1: Attitude to risk question

Question		
Thinking now about savings and investments, how much risk are you prepared to take that you might lose some of the money you put into a savings account or investment?		
Response	Ireland	UK
	%	
No risk at all	44.2	42.6
Low risk	27.4	28.3
Low to moderate risk	12.3	15.5
Moderate risk	9.8	9.2
Moderate to high risk	1.7	2.1
High risk	1.5	1.1
Dont know	3.1	1.2
Refused	0.1	
Total	100	100

Table 2: Risk variable for analysis

Attitude	Ireland %	UK	Variable Score
No risk at all or low risk	73.95	71.79	0
Low to moderate risk or greater	26.05	28.21	1

Table 3: Determinants of Savings and Investment Risk Attitudes for Ireland and the United Kingdom  
- Marginal Effects (ME)

Ireland			United Kingdom		
Variable	M.E.	S.E.	Variable	M.E.	S.E.
<u>Ethnicity</u>					
Except white Irish	-0.051	(0.032)	Asian-British: Indian	-0.089***	(0.030)
			Asian-British: Pakistani	-0.1116***	(0.032)
			Asian-British: Bangladeshi	-0.108***	(0.050)
			Asian-British: Caribbean	-0.070*	(0.034)
			Other Ethnicity	-0.119*	(0.047)
<u>Regional</u>					
Urban	0.076**	(0.033)			
Urban/Rural	-0.01	(0.040)			
Connacht/Ulster	-0.005	(0.048)	Wales	-0.048***	(0.019)
Munster	0.078**	(0.033)	Scotland	-0.043**	(0.019)
Leinster	-0.038	(0.034)	Northern Ireland	-0.117***	(0.019)
<u>Marital Status</u>					
Married	0.075***	(0.029)	Married	0.044***	(0.017)
Widowed	0.011	(0.074)	Widowed	0.011	(0.033)
Divorced/Separated	0.063	(0.058)	Divorced/Separated	0.031	(0.024)
<u>Other Variables</u>					
Age	-0.006***	(0.001)	Age	-0.003***	(0.000)
Male	0.141***	(0.022)	Male	0.124***	(0.012)
Illness	0.098***	(0.040)	Illness	-0.040***	(0.015)
No. of children	0.006	(0.011)	No. of children	-0.012**	(0.005)
<u>Highest Educational Qualification</u>					
Primary	-0.136***	(0.030)			
Lower secondary	-0.117***	(0.026)	Lower secondary	-0.034*	(0.017)
Non-degree qualification	0.099**	(0.047)	Non-degree qualification	0.048**	(0.024)
Primary degree /			Primary degree /		
Prof Qualification	0.078**	(0.034)	Prof Qualification	0.077**	(0.023)
Postgraduate	0.158**	(0.081)	Postgraduate	0.104***	(0.029)
			Other		
			educational qualifications	-0.097***	(0.029)
			None of these qualifications	-0.086***	(0.018)
Log Likelihood	-740.45			-2851.41	
N	1479			5254	

**Note:** Standard errors (S.E.) are in parenthesis, \*\*\*, \*\* significant at the 1 and 5 per cent level.

Table 4: Determinants of Savings and Investment Risk Attitudes for Ireland and the United Kingdom  
- Marginal Effects (ME); results for wealth proxies only

Variable	Ireland	United Kingdom
Total Savings	0.031*** (0.008)	0.027*** (0.004)
Total Borrowings	0.002 (0.008)	0.016*** (0.004)
Property Value	0.133*** (0.050)	0.03*** (0.008)
Income	0.015 (0.015)	0.041*** (0.008)

**Note:** Standard errors (S.E.) are in parenthesis, \*\*\* denotes significant at the 1 per cent level, while \*\* denotes significance at the 5 per cent level.



Table 5: Wealth Regressions for Ireland and the United Kingdom - OLS Regression; results for risk variables only

	Ireland	United Kingdom
Variable		
<i>Dependent Variable</i>	<i>Log of Savings</i>	
Risk	0.499*** (0.135)	0.663*** (0.097)
<i>Dependent Variable</i>	<i>Log of Borrowings</i>	
Risk	0.036 (0.191)	0.375*** (0.095)
<i>Dependent Variable</i>	<i>Log of Property Values</i>	
Risk	0.170*** (0.062)	0.190*** (0.054)
<i>Dependent Variable</i>	<i>Log of Income</i>	
Risk	0.036 (0.047)	0.134*** (0.026)

**Note:** Standard errors (S.E.) are in parenthesis, \*\*\* denotes significant at the 1 per cent level, while \*\* denotes significance at the 5 per cent level.

Table 6: Determinants of Savings and Investment Risk Attitudes for Ireland and the United Kingdom  
- Marginal Effects (ME); results for wealth instruments only

Variable	Ireland		United Kingdom	
	1 <sup>st</sup> stage		1 <sup>st</sup> stage	
Savings	***	-0.153 (0.092)	***	-0.018 (0.329)
Borrowings		-0.786** (0.313)	**	0.236 (0.528)
Property Value	***	0.453 (0.232)	***	-0.043 (0.416)
Income	**	-0.929** (0.418)	**	-1.49 (1.58)

**Note:** Standard errors (S.E.) are in parenthesis, \*\*\* denotes significant at the 1 per cent level, while \*\* denotes significance at the 5 per cent level.