

## Economic Thinking and Risk Attitudes: An Empirical Study



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### Abstract

In the light of the current economic crisis, which had its roots in high risk dealings in the international financial markets, the question how economically minded students are and what propensity towards risk they have, are essential to improving their financial literacy. In a broad survey including economic and non-economic schools 649 students aged 14 and 18 were questioned. In this paper results are presented and implications for classroom teaching and curricular development are derived.

### Introduction

The world economy suffered from a severe blow to one of its foundations: the financial system. Issues in mortgage markets and subsequently the lack of trust between financial institutions led to a crisis, similar to the Great Depression of 80 years ago. Due to the openness of the global economy the financial turbulence that originated in the US spread around the world and affected almost every other nation worldwide. Irresponsible and high risk mortgage granting of some financial institutions, the viral contagion of foreign economies and the real effects on employment, production and federal budgets

once again make clear the necessity of solid financial and economic literacy. Every citizen in a democracy has to be able to take care of his or her financial affairs and needs a basic understanding of certain basic financial concepts. Examples of these concepts can be the mechanism of supply and demand and the trade-off between risk and return. In order to become financially literate an individual needs to be taught how highly complex economic systems work. This amongst other things is a task educators have to perform.

In this paper results from a study that was conducted in Graz, Austria, Europe in April 2009 are presented. Subjects were asked to complete a standardized questionnaire covering the above-mentioned topics of economics and risk. The Austrian Education System splits students at the age of 14 into several groups. Those students going through to the Matura or Reifeprüfung are able to choose between Secondary Academic Schools and Vocational and Educational (or VET) Schools (Bmukk, 2009a). Within the group of VET Schools, there are specialized schools covering economic topics. Those schools are referred to as economic schools. The abundance of schools not – or only marginally – covering economic topics are referred to as non-economic schools.

The remainder of the paper proceeds as follows. Section 1 gives a short introduction into the relevant literature. Section 2 introduces the study design. Section 3 presents the questionnaire used. Section 4 discusses the hypotheses and covers the study's results. Section 5 concludes and derives implications for business education.

## **Literature Review**

The two basic research concepts of this study – economic thinking and risk attitudes – have been addressed before. Economic understanding belongs to a group of concepts used to describe entrepreneurial qualities. Within the literature (Faltin & Ripsas & Zimmer, 1998; Fueglistaller & Mueller & Volery, 2008; Bmukk, 2009) there are plenty of definitions for economic understanding reaching from entrepreneurship education to entrepreneurial competence to economic action. In the following an overview of those different aspects of economic understanding as well as a short description of each aforementioned concept is given.

Entrepreneurship education in the broader sense contains all educational measures necessary to develop entrepreneurial spirit and skills, leading to the formation of certain values, mindsets, and personal qualifications. Within an educational context, entrepreneurship education means teaching economic thinking (Bmukk, 2009). Entrepreneurial competence is the capability to realize ideas and visions. To achieve this creativity, innovative thinking and a certain degree of risk appetite are necessary. Furthermore, economic competence simplifies everyday life. Entrepreneurial competence is the foundation for the special skills entrepreneurs need to found a successful business (Commission of the European Community, 2005). Economic action results out of the human necessity to optimally manage limited resources. Human needs are unlimited, their available resources on the other hand are very limited. This disparity necessitates economic action (Homann & Suchanek, 2000). Due to the ongoing financial crisis, these definitions were not chosen and instead economic understanding was defined as understanding of how the economy functions.

The second basic research concept – risk taking attitudes – has been a concern of (financial) economists for a very long time. Von Neumann and Morgenstern (1953) were the first researchers to put economic behaviour onto solid scientific foundations. They argued that each individual has a

unique utility function. A utility function sums up all consumption decisions of an individual and transforms it into utility units. Although it is very hard – probably impossible – to accurately identify an individual’s utility function it is possible to analyze its general shape. Typically humans prefer more to less. The more money a person owns the more utility this wealth creates. After having satisfied their basic needs the marginal utility of an additional wealth unit decreases – the millionth dollar is worth less than the first dollar. This leads to a concave overall shape of the utility function. This abstract concept of a concave utility function also represents a risk-averse individual. Such individuals include risk into their decision making process.

In addition to risk aversion, there are also the notions of risk neutrality and risk appetite (Copeland & Weston & Shastri, 2005; Lengwiler, 2006). In this study, this classical von Neumann & Morgenstern (1953) approach of modelling individual decision-making was utilized. The rivalling prospect theory by Tversky and Kahnemann (1992), which includes perception into the decision-making process, is a promising alternative but was rejected to limit the already high complexity of the study.

### **Study Design**

The objectives for this survey were derived from two main questions: 1) How economically minded are adolescents? and 2) What is their attitude towards financial risks?

This survey has been conducted among 9th and 12th grade students in 32 classes in eight schools in Graz, Austria, from April to May 2009. In this survey, 649 students from different schools were asked to complete the questionnaire. The questionnaire consisted of 34 multiple choice questions. In the following, a short outline of the Austrian Education System is given. Within this framework the school types that participated in this study are displayed.

Education in Austria is compulsory for every child with permanent residence in Austria. It begins with primary school at the age of six and is fulfilled after the completion of the ninth year of school at the age of about fifteen. After four years of primary education in primary school, pupils can choose to attend either regular secondary school for four years, or secondary academic school for eight years. The latter is separated into a compulsory four year lower level, and a voluntary four-year upper level. About 30% of the pupils choose the secondary academic school, which entitles one to enter the higher education sector (university) after passing the final matriculation exam. Another option to enter the higher education sector is the technical and career vocational schools and colleges (VET colleges and VET schools). These types of schools focus on academical and technical skills and knowledge, providing a combination of both, which results in a workforce-oriented education. There are different types of VET colleges such as business, technique, or tourism and hospitality (North-South Centre, 2006). Another option after finishing the the ninth year of school is the apprenticeship training. Apprentices have to complete a predefined amount of company-based training and have to attend a part-time vocational school. Thus, apprenticeship training is also referred to as dual vocational training system or as dual system (Bmukk, 2009b).

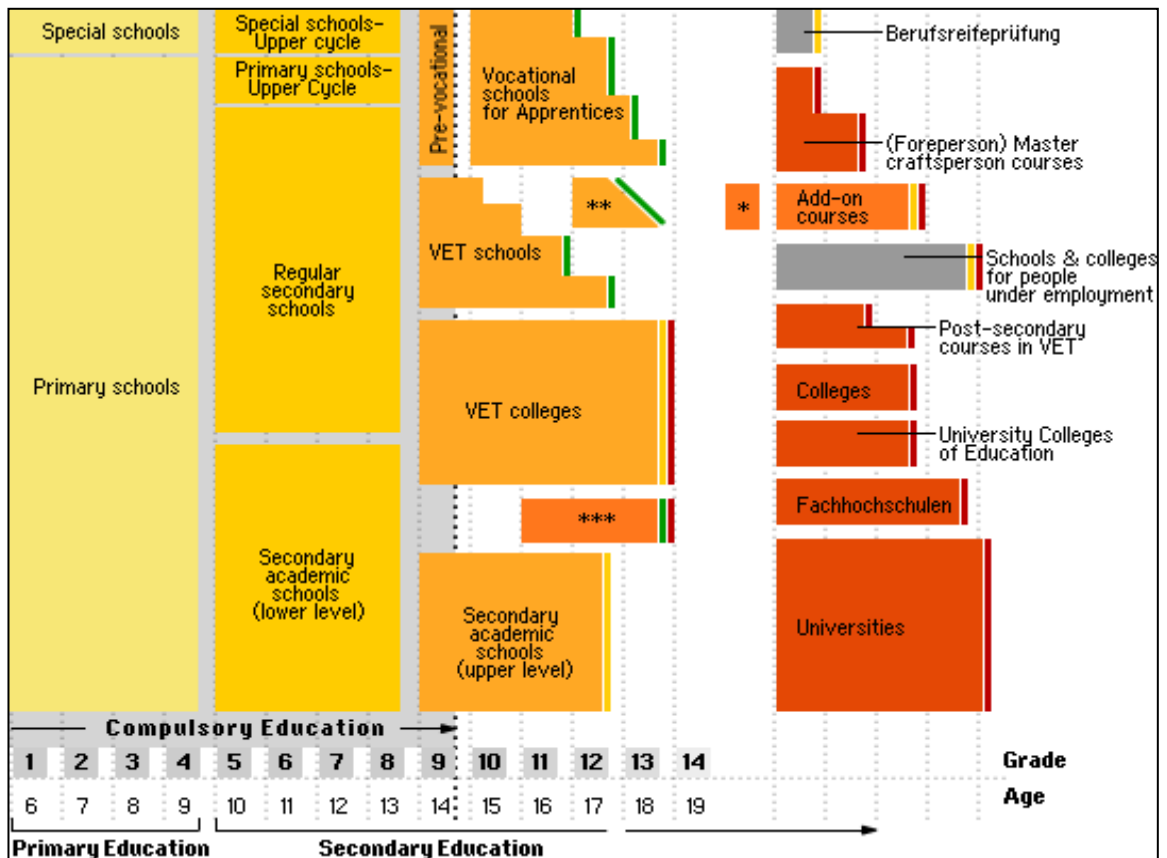


Figure 1. Austrian Education System (Euroguidance 2009)

Four school types have been chosen for this survey. Two from the economic, and two from a non-economic sector. All of these schools culminate in a matriculation or diploma exam. The successful completion of this exam entitles students to admission to university.

### Questionnaire

The following section provides a summary and selected content of the questionnaire. (A comprehensive presentation of all answer options is omitted due to space constraints).

#### Demographic Data

Pupils were asked to indicate their sex, age, their mother’s profession, their father’s profession, their own professional experience, and their native tongue. Pupils were also asked to state their reason for attending this particular type of school.

#### Economic Understanding

This section contained questions about the principle of supply and demand, exports and imports, customs duties, the government budget deficit, exchange rates and their impact on private individuals and companies, and the comparison of discounts and inflation with regard to their impact on income and insolvency. These questions were designed to guarantee comprehensibility for all pupils regardless of school type. Factual questions about accounting records or accountancy rules were therefore avoided as they would have privileged pupils of economic schools. Figure 2 shows an exemplary question:

If your mother's income rises by 50% and the prices of the goods she buys rise by 70%, this means that your mother	
<input type="checkbox"/>	can buy more goods than before.
<input type="checkbox"/>	can buy the same amount of goods as before.
<input type="checkbox"/>	can buy fewer goods than before.
<input type="checkbox"/>	No idea.

Figure 2. Inflation

The questions about economic understanding were subsequently amalgamated into a sum index. It should be noted that the concept of economic understanding is difficult to measure and can only be partly covered by the selected questions.

### *Risk Attitudes*

In this section, pupils were asked about their risk assessment and risk-bearing attitudes. Questions concerning risk-bearing attitudes dealt with various scenarios in which pupils were asked what proportion of a specified capital they would invest in a risky but highly rewarding return opportunity and what proportion they would rather set aside for a safe, but less rewarding alternative. Two further scenarios dealt with situations under uncertainty. In these cases all amounts of possible returns and losses were known, but not their probability. In order to investigate risk assessment, pupils were asked to assess the risk involved in various scenarios (lotteries).

### **Hypotheses**

One of the objectives of this study was to investigate causalities between economic understanding and risk attitudes of students from economic and non-economic schools. One would expect students graduating from economic schools to have a better understanding of issues regarding the economy than students from non-economic schools. This notion brings us to Hypothesis 1:

*H1: Students attending economic schools have a better understanding of economic issues than students of non-economic schools*

This surprisingly is not the case. Within the study, several measures were used to compare the different student groups. The measure for economic understanding indicated that students from non-economic schools have more understanding of economics than those from economic schools. The results for risk attitudes remained mostly inconclusive. In total, students from non-economic schools scored significantly higher (16.61) than students from economic schools (16.03). So H1 had to be rejected.

The second hypothesis is intended to connect economic understanding to risk awareness. Individuals, who understand the incremental structure of risky situations – hence have good economic understanding – tend to assess risk stronger in their decision-making process. As a result, they perceive the negative consequences associated with risk more clearly than individuals with less economic understanding. A rather extreme example of this behavior would be a statistician avoiding the roulette table because he knows his (very slim) chances. Hypothesis 2 therefore is:

*H2: Students with a better understanding of economic issues tend to be more risk-aware (Risk assessment)*

Again this hypothesis has to be rejected. Individuals with a high score on economic behavior tend to be less risk aware (Pearson Correlation coefficients: -0.130 and -0.069 for both Risk-Awareness Items). Apart from risk awareness, risk-bearing attitudes play an important role in the financial decision-making process. To continue the above example, it is not unthinkable to see statisticians gambling in a casino. That person knows his chances (high economic understanding) and is yet willing to gamble. Individuals with a low degree of economic understanding do not understand the incremental structure of the situation they are in and refuse to get involved. Therefore:

*H3: Students with a better understanding of economic issues tend to be less risk-averse. (Risk-bearing attitude)*

The study's results support this notion (Pearson correlation coefficients: 0.110 and 0.128 between economic understanding and both risk bearing attitude items). Taken together H1, H2 and H3 implicitly contain hypotheses 4 and 5:

*H4: There are differences in risk assessment depending on school type.*

*H5: There are differences in risk-bearing attitudes depending on school type.*

Again the study delivers evidence supporting H4. For situations of relatively small risks, there are significant differences between school types. In riskier situations, this difference vanishes. For H5, the evidence is mostly inconclusive, which is due to the difficulties encountered during the assessment of risk-bearing attitudes.

## **Implications**

The following recommendations for the area of economic understanding can be derived from our study:

- Economic schools should not merely focus on teaching techniques: Individual subjects (such as Business Administration and Accounting) have to be integrated more strongly in order to convey the bigger picture.
- In its function as a fundamental principle of economics and prerequisite for understanding economic contexts, mathematics has to be better integrated into the curriculum.
- Education – business education in particular – should be less focused on factual knowledge and more oriented on a person's competence to be able to solve problems self-dependently according to a given situation.

To conclude, the study has shown interesting results, but also raised some questions. These issues shall be further investigated in a follow-up study, which will contain questions designed to better measure economic understanding by placing pupils in decisive situations modeled as close to reality as possible and having a closer look at the motives for pupils' individual decisions.

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