

## 1. Introduction

Expected returns are estimated in line with expected risk when evaluating investment in assets and/or portfolios in the field of finance. Only a few studies, however, have attempted to investigate investment in human capital in this way; moreover even fewer studies attempted to do so *ex ante* (Hartog et al., 2004; 2007). This study thus attempts to fill this gap by combining finance theory with the theory of human capital in order to contribute to an understanding of the relationship between risk and return to investment in human capital in higher education.

## 2. Methodology

Between the academic years 2004/2005 and 2009/2010, a repeated cross-sectional survey of earnings expectations was undertaken of first year students at three Czech Faculties of Economics and one English Business School. Altogether there were 4,163<sup>1</sup> respondents. The questionnaire, which was used to collect the data, began with general questions relating to gender and age. In the second part, the students were asked about their expectations of income in current prices (i.e. without taking into account price inflation) in their first job immediately after graduation and then after 10 years of work experience. They were asked also about the level of earnings they would have expected if they had not entered higher education, both immediately after leaving school and after 10 years of employment.

## 3. Main findings

Finance theory<sup>2</sup> suggests that if investors behave rationally they will require a higher expected average rate of return if the expected risk<sup>3</sup> is greater (Markowitz, 1952). As risk increases, the expected return to the investment will increase as a result of the risk premium earned – in other words, investors should expect a higher return on an investment when that particular investment carries a higher level of risk or uncertainty associated with the return.

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<sup>1</sup> 935 respondents in England and 3,228 in the Czech Republic

<sup>2</sup> In particular the Modern Portfolio Theory (Markowitz, 1952)

<sup>3</sup> In this paper two ways of estimating risk are used. Firstly, risk is measured by the variance of expected earnings attached to an educational choice. In addition, the standard deviation of the rates of return is used as a proxy for risk.

This study has shown that there is a positive relationship between expected risk and expected returns<sup>4</sup>. The analysis provides evidence that students expect to benefit from their investment in higher education more in the medium term than at the point of labour market entry. However, a question arises about whether the increase in the *ex ante* rates of return was caused by the uncertainty of future returns, i.e. by the greater risk borne by the investors when estimating returns ten years after graduation, or whether there was a genuine increase expected in the rates of return, i.e. whether students would expect higher rates of return even if the investment was risk-free.

Regression analysis was used to identify risk-free rates of return and as a result it was concluded that the expected rates of return were indeed lower immediately after graduation than ten years later for both men and women at all surveyed institutions. In effect, students do not expect to benefit from their investment in higher education more in the medium term to compensate only for the increased risk in terms of uncertainty of obtaining the returns in the future, but genuinely even if the risk is eliminated.

Hartog et al. (2007) simulated the risk of investment in human capital and estimated the *ex ante* risk of university education using the coefficient of variation. Their best guess was a coefficient of variation of about 0.3, which they found to be comparable with that of a randomly selected financial portfolio with some 30 stocks (Hartog et al., 2007). In our study the estimate of individual *ex ante* risk associated with a university education is a coefficient of variation of 0.35. In addition, students in our surveyed samples expect greater variance in the income which they expect to earn with a university education than in the income which they would expect to earn with a high school education. Similarly, the coefficient of variation is greater for earnings expectations with experience than without. Therefore it seems that the further into the future the estimate is done the less sure are the students of the relative position in the earnings distribution at which they will end up. As a result we conclude that, at least partially, expected earnings increase with education and experience to compensate for the expected risk.

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<sup>4</sup> The rates of return are calculated using the short-cut method (Psacharopoulos, 1981) in its original form in the cases of the Czech sample and English sample (2004/2005 and 2005/2006), and a modified version developed by Anchor et al. (2011) for the English sample between 2006/2007 and 2009/2010.

Díaz-Serrano and Hartog (2006) reported on the existence of a risk-return trade-off across educational choices in the Spanish labour market. Periera and Martins (2002) identified a rather large compensation which was needed to compensate for the risk associated with the investment in education; for every 2pp increase in risk there was a 1pp increase in average rates of return. Our study shows that the required compensation for incurred risk seems to be higher for women than men. On average, for an approximately 1.1pp increase in risk there is a 1pp increase in the average expected rate of return to higher education for men, and for a nearly 2pp increase in risk there is a 1pp increase in the average expected rate of return for women.

#### **4. Conclusions**

This study assumes higher education to be an investment rather than a consumption good. Expected earnings and *ex ante* rates of return were therefore examined in relation to risk. The findings indicate that students act rationally as investors, since they are found to require compensation via increased expected returns for their expected risk of investment in higher education. In addition, students are found to expect their investment in university education to be more profitable in the medium term, even if the risk associated with the investment is eliminated.

#### **References**

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