

## Risk Management of Students in Response to the Proposed Degrees Structure Change at the University of Zimbabwe

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### Abstract

*This paper investigated the risk and time preference of the University of Zimbabwe students in response to the proposed degrees structure change in the faculties of Arts and Science. Overall, 70.76% of the students were risk-loving, expressing their willingness to embrace the proposed specialization degree program structure. Overall, 51.46% were lowly discounting on time, preferring an extra year of study and hence a delay in entry onto the job market. There were insignificant associations between the preferences and the demographic factors, faculty, gender and academic year of study; however, a statistically significant association between the two preferences was observed. The logistic regression model and its multinomial form showed that risk preference and time preference were two-way dependent and hence reliable indicators of each other.*

**Key Words:** decision, risk preference, time preference, association, logistic regression

### 1. Introduction

Risk management is the process of identification, assessment, and prioritization of risks in decision making. Interest in risk management has grown immensely for a better understanding of the risk attitudes and preferences of individuals in decision making. The crucial step is to determine the risk preferences and time preference of the recipients or people upon whom a decision is being made. Research on decision making under uncertainty has a long tradition as it involves both risk and time, which are interrelated variables (Andreoni and Sprenger, 2010, Epper *et al*, 2009). Such decisions include the ones with a big impact on life such as the choice of education, the choice of career, investment decisions, and even when and if to get married or divorced (Spivey, 2010). Human preferences are not identical and have an impact on the extent to which economic success is achieved. If people are impatient, they may be reluctant to invest and educate their children (Tanaka *et al*, 2010), and in some instances the intended beneficiaries, for instance, the children's impatience can deter investment in their education.

A better understanding of how people weigh future consumption against current consumption is crucial in comprehending many individual economic decisions including how much to invest in education, health care and savings (Laurie, *et al*, 2010). Typically, optimal decisions tend to hinge on the risk and time preferences of individuals; hence there is a need to ascertain whether these two variables are dependent and reliable indicators of each other. Spivey (2010) observed that risk preference directly impacted the timing of marriage (*time preference*) and that demographic features in particular gender was crucial, with men significantly contributing to the effect of risk aversion on timing of marriage. Schmidt (2008) alluded to the fact that risk preference and uncertainty were pivotal on marriage and fertility decisions. Schmidt (2008a) further argued that when considerable uncertainty existed regarding the availability of suitable marriage partners, women's risk preferences tended to play an important role in marriage and fertility timing decisions.

Fetter (1915) noted that time-value/preference was essential in that goods that met momentary desires made an exaggerated appeal to untrained minds. Therefore an improper estimation of the relative values of the present and the future establishes the significance of time preference in decision making. The University of Zimbabwe has been offering three-year general degree programs, particularly, in the faculties of Arts and Science since its inception and is planning to change them to four-year honours degree programs, including one year of industrial attachment. Evidence that risk preference varies within subjects raises challenges for policy decisions that hinge on assumptions about the public's degree of risk tolerance, as noted by (Berg *et al*, 2005). Students' risk preference and time preference are exogenous and noisy variables; and an investigation of them is essential in determining their influence on students' willingness to embrace the proposed change. This paper seeks to ascertain and model the risk and time preferences of the University of Zimbabwe students in the faculties of Arts and Science on the proposed change in their degree programs structure.

## **2. Data and methodology**

Data was collected from a sample of 171 students comprising 124 (72.5%) from the Faculty of Arts and 47(27.5%) from the Faculty of Science. This distribution was necessitated by the fact that we have a large number of students in the faculty of Arts than Science, thus this distribution helps in getting a representative view. The sample consisted of (52.7%) female and (47.3%) male students. A further aggregation within each faculty was done to take care of different preferences at different study levels. The Faculty of Arts sampled students consisted of 38.1% first year students, 25.6% second year and 10.71% third year students whilst there were 13.69% , 5.37% and 6.54%, respectively, from the Faculty of Science.

The sampling technique used was quota sampling and convenience sampling was used to identify subjects to fill up each quota. The issues of accessibility of the sampling frame, that is, the student register as well as devising a proper probability sampling procedure within the timeframe of this research were also considered. The students were divided into two main strata, that is, Faculty of Arts and Science. The total sample size from each stratum was calculated from the respective faculty registry information to ensure representativeness.

A questionnaire was administered for the collection of data. The collected data were captured into SPSS and data manipulation and analysis were done using STATA. A variable that measures risk preference was created from the first eleven lottery questions and another variable for time preference was created from the last three lottery questions. These two variables were then used to categorize the risk and time preferences of the students, overall, by faculty, gender and level of study. Chi-square tests of association were used to determine the factors that influenced the risk and time preferences of students and the presence of dependence between the two preferences.

Furthermore, the logistic regression model was used to explain time preference in terms of risk preference, and the multinomial logistic regression model was used to explain risk preference in terms of time preference.

## **3. Results**

Risk preference assessment revealed that overall, 23.39% (40) of the students were risk averse, 5.85% (10) were risk neutral and 70.76% (121) were risk loving.

Table 1 shows that Science students were slightly more risk loving than their Arts counterparts; similarly, male students were more risk loving than female students. The least risk loving academic year of study group was the final year students, whilst the first year students were most risk loving.

There were no significant associations between risk preference status and any of the demographic factors, faculty of study ( $p=0.936$ ), gender ( $p=0.170$ ), and academic year of study ( $p=0.373$ ).

Time preference analysis showed that 51.46% (88) of the sampled students were lowly discounting and 48.54% (83) of them were highly discounting on time.

Table 2 shows that Arts students were highly discounting and Science students were lowly discounting on time; male students had no distinct time preference whilst their female counterparts were lowly discounting on time. First and second year students were lowly discounting whilst the final year students were highly discounting on time.

Insignificant associations were revealed between time preference status and the demographic factors, faculty ( $p=0.161$ ), gender ( $p=0.715$ ), and academic year of study (0.411).

There was a significant association between risk preference and time preference ( $p=0.013$ ); with risk averse students being highly discounting and risk loving students being lowly discounting on time.

Table 3 gives the results for the logistic regression model of time preference in terms of risk preference status to assess their relationship. The overall relationship ( $p\text{-value} = 0.015$ ) indicates that risk preferences affect students' time preferences. Risk loving students are significantly different from risk averse students ( $p\text{-value}=0.011$ ) while risk neutral students are not significantly different from their risk averse counterparts (0.766) in their choice of time preference. The risk averse preference is not significantly associated with the time preference choice of the students ( $p\text{-value} = 0.062$ ). The table shows that having a risk loving preference relative to having a risk averse preference increases the log odds of a student having a low discount on time by 0.9697. Similarly, having a risk neutral preference relative to having a risk averse preference decreases the log odds of a student having a low discount on time by 0.2283. The odds of a student having a low discount on time are almost three times ( $odds=2.6371$ ) higher for a risk loving student as compared to a risk averse student. A risk averse student is highly likely to have a low discount on time as compared to a risk neutral student ( $odds = 0.7959$ ). This table shows that a student's time preference is associated with the student's risk preference.

Table 4 shows the results for the multinomial logistic regression model relating the risk preferences to the time preferences. From the table, the relative log odds of a student being risk averse relative to a student being risk loving will decrease by 0.9697 if moving from the lowest level of time preference (high discount) to the highest level of time preference (low discount). This indicates that risk averse students are more likely to discount highly on time compared to risk loving students. The relative log odds of a student being risk neutral relative to a student being risk loving will decrease by 1.19796 if moving from the lowest level of time preference (high discount) to the highest level of time preference (low discount). This indicates that risk neutral students are almost equally likely to discount lowly on time with risk loving students. This table thus shows that a student's risk preference is associated with the student's time preference.

#### **4. Conclusion and Recommendations**

We conclude that the students were overall risk-loving, showing that the students were more willing to adopt the proposed four-year degree programs structure. The most notable risk-loving groups were Science, male and first academic year students. The demographic factors were insignificantly associated with either risk preference or time preference, showing that they were not pivotal determinants of the preferences. A statistically significant association existed between the two preferences, coupled with their established dependence through both the simple and multinomial logistic regression models, show that time preference and risk preference are reliable indicators of each other. We recommend that an investigation of the risk and time preferences of the administrators and lecturers at the university be conducted to ascertain their complimentary willingness and readiness to embrace the proposed change as they are an integral constituency in the change's implementation and sustenance.

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**Table 1: Risk preference analysis by faculty, gender and academic year of study**

	Faculty		Gender		Year of study		
	Arts	Science	Male	Female	1	2	3
Risk averse	23.77	21.28	17.50	29.21	17.72	25.86	33.33
risk neutral	5.74	6.38	7.50	4.49	7.59	3.45	6.06
Risk loving	70.49	72.34	75.0	66.29	74.68	70.69	60.61

**Table 2: Time preference by faculty, gender and academic year of study**

	Faculty		Gender		Year of study		
	Arts	Science	Male	Female	1	2	3
High discount	52.46	40.43	50.00	47.19	49.37	43.10	57.58
Low discount	47.54	59.57	50.00	52.81	50.63	56.90	42.42

**Table 3: Logistic regression of time preference in terms of risk preference**

Time preference	Coefficient	Odds Ratio	Standard Error	z	P>z
Risk neutral	-.2282586	0.7959	0.76556	-0.3	0.766
Risk loving	.9696961	2.6371	0.37944	2.56	0.011
Constant	-.6190392		0.3315	-1.87	0.062

**Table 4: The multinomial logistic regression model for risk preference in terms of time preferences**

Risk preference	Coefficient	Standard Error	z	P>z
Risk averse				
Low discount	-.9696961	.3794399	-2.56	0.011
Constant	-.6539265	.2417882	-2.7	0.007
Risk neutral				
Low discount	-1.197955	.7143353	-1.68	0.094
Constant	-1.966113	.4035556	-4.87	0
Risk loving		(base outcome)		