

**INVESTMENT RISK BEHAVIOR IN DIFFERENT DOMAINS:
ENTREPRENEURS VS. PUBLIC EMPLOYEES**

Prof. Massimo Franco, Università degli Studi del Molise, Italy
mfranco@unimol.it

Dr. Nicola D'Angelo, Università degli Studi del Molise, Italy
nicola.dangelo@unimol.it

ABSTRACT

The definition and measurement of risk propensity has long been a topic of debate among researchers, reflecting the perceived theoretical and practical importance of the construct. Recent work by Weber and collaborators suggests that such apparent domain differences in risk taking might have more to do with situational, domain-related differences in the perception of risk than with attitudes toward risk (Weber and Milliman, 1997; Weber, 2001). The bungeejumpers may well dislike risk in both his recreational and social decisions (i.e., be consistently risk-averse across both domains) but perceive the risk of fall from a bridge to be very low (perhaps because it feels controllable) and the risk in social situations to be high. This study analyzes differences in risk behavior and risk propensity between different domains like entrepreneurs and people employed in public administration. We used a translated and validated version of the original Domain-Specific Risk-Taking (DOSPERT) scale developed by Weber, Blais, and Betz in Italian language. This scale is for use in measuring, for several risky activities/behaviors, an individual's behavioral likelihood, risk perception, and perception of expected benefit. The scale contains 40 items, evenly distributed across five general domains: financial decisions, health/safety, recreational, ethical, and social decisions. We investigated if entrepreneurs are more risk-taking in financial domain than people employed in public administration.

Keywords: Risk Propensity, Investment, Diversity, Gender.

INTRODUCTION

The appropriate definition and measurement of risk propensity has long been a topic of debate among researchers in personality psychology, organizational behaviour, decision research, economics and other fields, reflecting the perceived theoretical and practical importance of the construct (Yates and Stone, 1992)

A study by Sitkin and Pablo (1992) assigns influence both to current characteristics of the subject and the perception of the situation at the time of the decision as determinants of risky behaviour.

Using the definition proposed by Kahneman and Tversky (1979) this contribution identifies risky behaviour in conjunction with the degree of risk associated with decisions that are taken. A decision will be more hazardous when the results are uncertain, the goals are difficult to reach and the potential consequences could be significant.

In this context, the willingness to take risk is linked to the predisposition of the subject itself (Rowe, 1977; Baird and Thomas, 1985). Some studies have found that there is a direct correlation between age, seniority and willingness to take risk. The older and more senior a person is, the less likely they are to take risk. Brockhaus (1980) illustrated by analyzing a sample of entrepreneurs and employees of public administration, that this predisposition is innate. This result was confirmed by studies by Nicholson, Frenton et al. (2002) on a sample of managers and professionals. Other studies have tested the influence of past behaviour in terms of success and failure on the propensity to take risk. These studies, however, have found conflicting results. In some cases, past success led to a repetition of hazardous behaviour (March and Shapira, 1980) and in others the opposite was the case, since a desire to protect the results of past success prevailed (Kahneman and Tversky, 1979).

In Economics, choices are presumed to be made rationally through the weighing of costs and benefits. A rational person would select the option that had the highest benefits in relation to cost incurred. However, there is evidence to suggest that people make choices involving risk taking based on their individual perception of the risk involved rather than always choosing the seemingly rational option.

Risk taking has often been thought to be a heritable trait most prevalent in males due to way they perceive the risk (Cook and Bellis, 2001). Perception of risk is what shapes the expected utility curve and underlies the rationale for a person's choices. Perhaps one of the most influential scholars in the realm of risk behavior and perception studies is Paul Slovic. He has been conducting experiments for several decades pertaining to risk decisions across various topics. He has noted that traditional economic theory does not always address the higher

effects of accidents that tend to be social and consequential. Particularly, people view hazard risks as unnecessarily higher than it should be and actually find it to be unacceptable (Slovic, 1987).

Using experiments to classify one's risk is no new phenomena, but is slowly becoming more accepted in the academic world. Weber and Milliman (1997) studied risk behavior in the context of horse betting and analyzed the changes in the person's betting pattern and their decisions after each round based on how their perceived risk had changed. Another study of interest was done by Dionne, Fluet, and Desjardins (2007) on risk perception in the case of impaired driving. They found that those who tend to underestimate the risk of receiving a DUI are less cautious and, thus, more likely to get into trouble on the road. They sampled people with past infractions and compared them to the general population in order to determine how their risk perception differed when it came to driving under the influence of alcohol. In their study, gender is not shown to have an effect, but age does. Overall, they found that those who underestimate the risk of receiving a DUI are more likely to commit those violations.

DOSPERT

Assessing the risk of an individual can be a tricky subject as there are many factors that can influence an individual's decision. In order to examine the relationship between risk perception and risk taking it is necessary to use a standard measure to compare results. Weber, Blais, and Betz (2002) developed a scale that was designed to measure this relationship across several different domains. They call it the "Domain-Specific Risk-Attitude Scale." They first conducted this study to examine risk behavior across genders. A questionnaire was developed assessing risk in a scaled format across five domains. They found that males and females differed in risk perception across all domains except social risk. To test the reliability of their scale, they used a subset from the first study and discovered that individuals were not consistent with their own risk decisions across domains. The differences in behavior could be explained by the perceived risk and the expected benefits of a given risk. The scholars adapted their scale to study adult populations across cultures, primarily English and French speaking (Blais and Weber 2006). The one scale distinguished risk-taking behaviors while the other examined risk perception. They gave half of the subjects the risk taking scale first and the other half the risk perception scale and found no order effects. They used multilevel modelling to reveal any behaviors within individuals or in groups. They found that the French-speaking group reported a higher mean level of perceived risk than the

English speakers. The subjects seemed to be more similar to other respondents than they were to themselves across the domains.

Using scales such as the Domain-Specific Risk-Attitude scale can be useful in determining the category in which risk taking is most prevalent or where the risk perception has the greatest effect on decisions.

Three major extensions on the study of risk taking can be seen in our approach, which builds on previous work by Weber and colleagues. First, we examine the domain specificity of risk taking.

Second, we conceptualize risk taking within a risk–return framework; that is, we see it as a tradeoff between hope and fear (see Weber, 2001 and Weber & Milliman, 1997). To model risk taking as a tradeoff between risk (fear) and expected return (hope) we first must understand and measure decision makers' perceptions of the risks and expected benefits of risky behaviors.

Weber et al.'s (2002) DOSPERT scale measures people's stated likelihood to engage in risky behaviors as well as their perception of the risks and expected benefits of these activities, allowing us to examine the relationship between these three variables. Although Horvath and Zuckerman (1993) discussed a possible relationship between risk perception and risk taking, they neither attempted to measure perceptions of risk or expected benefit nor included these variables in their model.

Finally, we look for similarities and differences in risk taking as a function of sex, culture, and membership in specific populations and examine possible explanations for these observed group differences. Previous work suggests that such differences exist. A great deal of research has examined sex differences in risk taking (e.g., Eckel & Grossman, 2002; Poppen, 1995; see Byrnes, Miller, & Schafer, 1999, for a meta-analysis) or the influence of culture (e.g. Weber & Hsee, 2000b), two topics we will address in this first section. In contrast, only little attention has been paid to the heterogeneity of risk profiles among specific populations of risk takers; we devote a separate section of this chapter to this important issue.

OBJECTIVES

By acknowledging that risk taking has multiple determinants, involving both the perceptions of benefits and risk and a true attitudinal component that reflects a person's propensity to take on (or shy away from) an option perceived as being risky, we allow for both cognitive/affective differences in the perception of the situation and risk attitude as a true

personality trait to play a role in risk taking. Because the former variables are often domain specific (partly as a function of previous experience and familiarity with different domains of risk), their addition to the model of risk taking allows the perceived-risk-attitude personality trait to be consistent across situations. We also follow the prescription of Weber et al. (2002) – who argued that all social science theories ought to be tested cross-culturally, to understand which model variables are similar across cultures (reflecting our common biological and evolutionary history as *Homo sapiens*) and which variables are subject to cultural shaping and construction. Specifically, we are interested in whether domain-specific differences in risk taking exist in an Italian population; whether there are cultural differences in risk taking between an American and an Italian population; and in what way(s) a risk–return model of risk taking will explain observed domain and cultural differences in risk taking. To this aim we selected two different samples of entrepreneurs, for which it is assumed that the level of financial risk propensity is high, and a control group of female and male people employed in public administration, for which it is assumed that the level of financial risk propensity is low.

METHODOLOGY

The empirical research was conducted on two sample groups: one composed of entrepreneurs and the other was made up of different civil servant. The first sample consisted of 60 entrepreneurs extracted from a database provided by the Campobasso Chamber of Commerce updated 31 December 2008. The sampling was conducted by a method using a stratified probability sampling rate equal to 0.002, on the population of Molise consisting of 32,789 businesses. Only one of the survey packages collected were discarded (female civil servant) for failing to meet our pre-established completeness criterion (no more than 5 missing responses on 120 items).

The sampling, carried out using the SPSS statistical program, made it possible to select a primary sample and a reserve sample, which was necessary in cases it was impossible to administer the questionnaire to companies in the main sample. Were chosen, as the discriminating variables the business sector and the home province (Campobasso and Isernia). Given that previous research shows that in the agricultural sector there is a high incidence of companies on paper but in reality not working, the sample excluded this sector, even if it represents 65% of the total population.

The second sample consisted of 60 civil servant from various government offices (university, municipality, province) in the same region of the first sample, in order to sterilize, as much as

possible, the impact of context on the results. The sampling was random, however, it tried to understand the different levels of supervision provided by the national contract.

Survey administration differed slightly between civil servant and entrepreneurs. For the entrepreneurs, we went directly to the related firm to complete the questionnaires. For civil servants, we sent questionnaires by mail with the necessary information, which, once completed, were sent back to the us

The questionnaire consisted of two sections: the first section of a general nature, for the collection of demographic, social and motivational information about subjects interviewed, the second section was designed using the methodology widely tested questionnaires DOSPERT-E, duly translated in Italian language (Domain-Specific Risk Scale, English version, Weber, Blais, Betz, 2002).

RESULTS

The Italian validation of the Domain-specific risk scale

The DOSPERT-I is an Italian-language scale assessing tendencies to engage in hazardous behaviour, as well as perceptions of risk and the expected benefits from such behaviour, and it is derived from an English version and validated by 120 Italian participants. The scale contains 25 items in five distinct domains of risk taking: ethical, recreational, health, social and investment.

The DOSPERT-I (25 items, evaluated on each of three response subscales) was administered to 120 Molise's inhabitants, equally divided in males, females, entrepreneurs and civil servants. The mean age of the entire sample was 46.04 years (SD = 10.19).

Henceforth we will refer to the original version of the scale as the DOSPERT-E, and our translated version of the scale as the DOSPERT-I (Italian version) the three separate judgements as response scales, and the five content areas as domain subscales. We used the method of back-translation (Brislin, 1986) for all materials used in the study with native/fluent speakers.

However, the original DOSPERT were eliminated on the domain of gambling as a certain item because we think they were prejudicial to the privacy of participants and difficult to use given the cultural context of Molise.

To determine risk behaviours, participants read 25 statements relating to these risk domains and indicate the likelihood that they themselves would engage in the activity or behaviour described (1='very unlikely' to 5='very likely'). The risk perception component assesses whether any observed risk behaviour is a result of risk perceptions or due to attitudes towards

perceived risk. Participants are asked to indicate how risky they perceive the same 25 statements to be, using a scale between '1' and '5' (1='not at all risky' to 5='extremely risky').

Demographic information and responses on all three response subscales did not significantly differ between entrepreneurs and civil servant and thus the samples were combined and analyzed together.

Reliability statistics for the six domains of the DOSPERT-I are shown in Table 1, in particular Cronbach's alpha.

Table 1: Domain-subscale-specific Cronbach's alpha for risk behavior, risk perception, and expected benefit subscales

<u>Domain</u>	<u>Cronbach's Alpha</u>		
	<u>Behavior</u>	<u>Perception</u>	<u>Benefit</u>
<u>Recreational</u>	0,75	0,73	0,71
<u>Social</u>	0,73	0,77	0,51
<u>Health</u>	0,56	0,54	0,44
<u>Ethic</u>	0,73	0,45	0,64
<u>Investment</u>	0,36	0,70	0,50

Note: Based on a sample size 119 participants.

We examined the Internal consistency reliability of our translated instrument for all participants (N=119).

The data obtained for the risk behavior subscale showed good reliability in recreational, social and ethic domains (.75, .73, and .73, respectively), respectable correlation for health domain (.56), and lower correlation for investment domain (.36). Lower correlations, although in a similar ordering, emerged for the expected benefits subscale, where the poorest correlations were in the health, social, and investment domains (.44, .51, and .50, respectively), but good correlations were obtained for, ethical (.64), and recreational (.71) domains. Finally, for the risk perception subscale, there were lower values on ethic and health domains (.45 and .54, respectively), but higher values for the recreational, social, and investment domains (.73, .77, and .70, respectively).

The similarity between degrees of risk taking in different domains was assessed by correlating the risk behavior scores across respondents for pairs of domains. Table 2 shows the

correlations for each pair of domain subscales. The generally low values of these correlations suggest that risk taking does not easily generalize across domains, reiterating the need for a domain-specific measurement instrument.

Table 2: Pearson correlations among domains for risk behavior scale.

<u>Domain</u>	<u>Recreation</u>	<u>Social</u>	<u>Health</u>	<u>Ethic</u>	<u>Investment</u>
<u>Recreational</u>	–	0,50	0,65	0,23	0,26
<u>Social</u>		–	0,34	0,07	0,13
<u>Health</u>			–	0,39	0,37
<u>Ethic</u>				–	0,32
<u>Investment</u>					–

Note: Based on a sample size 119 participants.

In the previous section we challenged the prevailing notion that risk taking is a stable trait in which individuals show consistent risk-seeking or risk-avoiding behavior across domains and we subscribed to an alternative approach that appreciates the domain specificity of risk taking: Individuals who exhibit high levels of risk-taking behavior in one content area (e.g., bungee jumpers taking recreational risks) can exhibit moderate or low levels in other risky domains (e.g., financial). In the following study, we sought to further validate the domain-specific nature of risk taking by recognizing the heterogeneity of risk profiles among experimental samples.

Risk-Taking Behavior in Heterogeneous Populations

Although our study might seem to resemble previous research, such as investigating stockbrokers', bankers', and lay people's risk attitudes in the financial domain (e.g. MacCrimmon & Wehrung, 1990), ours differs in examining domain specific behaviors, and employing "domain-specific" participants, which also provides us with another, novel way to test the validity of the DOSPERT scale (Weber et al., 2002).

Mean behavioral scores for each risk domain are given in Table 3. This table is organized such that domain-specific risk propensity can be viewed across columns, whereas differences dependent on subsample membership can be viewed across rows-variance across both columns and rows indicates these dependencies. We propose that the subsample is a useful

level of analysis, especially when subsample clustering can be theoretically, empirically, or intuitively performed prior to analyses. Here, we report several indicators of this advantage. We established that will take in consideration only difference in the means of at least .20.

Table 3: Mean scores on DOSPERT-I subscales, by subsample

<u>Subsample</u>	<u>Subscale (risk-taking domain)</u>				
	<u>Behavior subscale</u>				
	<u>Recreation</u> <u>al</u>	<u>Social</u>	<u>Health</u>	<u>Ethic</u>	<u>Investment</u>
<u>All</u>	2,39	2,88	2,09	1,25	2,10
<u>All entrepreneurs</u>	2,31	2,86	2,05	1,25	2,10
<u>All civil servants</u>	2,46	2,88	2,12	1,25	2,11
<u>Females</u>	2,33	2,96	<u>1,89</u>	1,17	2,08
<u>Males</u>	2,45	2,80	<u>2,27</u>	1,34	2,13
<u>Female entrepreneurs</u>	2,35	<u>2,99</u>	<u>1,87</u>	<u>1,17</u>	<u>2,03</u>
<u>Male entrepreneurs</u>	<u>2,29</u>	<u>2,77</u>	<u>2,24</u>	<u>1,33</u>	<u>2,17</u>
<u>Female Civil servants</u>	2,30	2,94	<u>1,92</u>	1,16	<u>2,14</u>
<u>Male Civil servants</u>	<u>2,61</u>	2,83	<u>2,31</u>	1,34	<u>2,09</u>
<u>Subsample</u>	<u>Perception subscale</u>				
	<u>Recreation</u> <u>al</u>	<u>Social</u>	<u>Health</u>	<u>Ethic</u>	<u>Investment</u>
<u>All</u>	3,39	2,53	3,54	4,11	3,56
<u>All entrepreneurs</u>	3,38	2,52	3,49	<u>3,98</u>	<u>3,46</u>
<u>All civil servants</u>	3,40	2,55	3,59	<u>4,23</u>	<u>3,65</u>
<u>Females</u>	3,45	2,54	<u>3,65</u>	4,13	<u>3,66</u>
<u>Males</u>	3,34	2,53	<u>3,43</u>	4,08	<u>3,45</u>
<u>Female entrepreneurs</u>	<u>3,35</u>	2,54	3,57	<u>3,98</u>	<u>3,52</u>

<u>Male entrepreneurs</u>	<u>3,42</u>	2,49	3,43	3,99	3,41
<u>Female Civil servants</u>	<u>3,56</u>	2,53	3,74	<u>4,29</u>	<u>3,81</u>
<u>Male Civil servants</u>	<u>3,25</u>	2,57	3,44	4,17	3,49

Expected benefits subscale

<u>Subsample</u>	Recreational	Social	Health	Ethic	Investment
<u>All</u>	2,26	2,04	1,46	1,33	2,00
<u>All entrepreneurs</u>	2,28	2,08	<u>1,54</u>	<u>1,43</u>	2,04
<u>All civil servants</u>	2,22	1,97	<u>1,36</u>	<u>1,21</u>	1,96
<u>Females</u>	2,27	2,10	1,49	1,38	2,03
<u>Males</u>	2,25	1,97	1,42	1,27	1,97
<u>Female entrepreneurs</u>	<u>2,38</u>	<u>2,19</u>	<u>1,60</u>	<u>1,53</u>	<u>2,11</u>
<u>Male entrepreneurs</u>	2,21	2,01	1,49	<u>1,35</u>	<u>1,97</u>
<u>Female Civil servants</u>	<u>2,15</u>	<u>2,00</u>	<u>1,38</u>	<u>1,23</u>	<u>1,95</u>
<u>Male Civil servants</u>	2,29	1,93	1,35	<u>1,19</u>	<u>1,96</u>

Note: Based on a sample size 119 participants.

First of all, the financial domain in risk-taking shows that are few and contrasting results about the categories. Despite the hypothesis, civil servants engage more frequently in risk behavior than entrepreneurs (2.10 and 2.11, respectively). Moreover, male entrepreneurs engage in investment risk behavior more than male civil servants (2.17 and 2.09, respectively). Yet, the result of female civil servants stand out in a singular way.

Other interesting results derive from the analysis of the recreational domain. In fact, male civil servants engage more frequently in recreational behavior than male entrepreneur (2.61 and 2.29, respectively). Finally, as demonstrated by Eckel and Grossman (2002) male are more risk taking in the health domain than female, in both category of entrepreneurs and civil servants.

The financial domain in risk perception shows that males have less risk perception than female. However, this result depends on the great difference into the female group. In fact, female civil servants perceive financial decision more hazardous than female entrepreneur (2.52 and 2.81, respectively). No interesting differences are in the social domain, while males perceive health decision less risky than females.

Moreover, civil servants (4.23) perceive less risky ethic decision than entrepreneur (3.98), but female civil servants more (4.29). Finally, male civil servants (3.25) fear less about recreational decision than female civil servants (3.56), but the opposite is for entrepreneurs (3.35 females, 3.42 males).

Referring to the investment domain, the expected benefits differ overall between female entrepreneurs and female civil servants (2.11 and 1.95, respectively), but also comparing female entrepreneurs with the other categories.

Yet, entrepreneurs (1.43) expect more ethical benefits in hazardous behavior than people employed in public administration (1.21). Finally, female entrepreneurs expect more benefits than female civil servants in all social (2.19 than 2.00), recreational (2.38 than 2.15), and health (1.60 than 1.38) domains.

DISCUSSION

The primary goal of this study was to develop and validate an Italian-language scale that allows for the assessment of domain-specific risk propensity. Our results suggest that the DOSPERT-I is such a tool, based on evidence of reliability, convergent validity, and test–retest reliability.

Furthermore, our results replicate many, if not most, of the findings in the U.S. sample studied by Weber et al. (2002): Risk behavior (apparent risk taking) varied for a given respondent across the five content domains. Domain-specific risk taking in one domain showed very little relationship to risk taking in other domains. However, these differences in risk taking were almost completely explained by differences in the perceived levels of risk and benefit associated with activities.

Also similar to participants in Weber et al. (2002), male respondents were found to be more risk taking than females in all but the social domain (Table 3). This DOSPERT-I scale could benefit personality psychologists working with Italian populations and has many other potential applications. By offering a tool that can assess components that contribute to risk propensity (perceived risk, expected benefit, and perceived risk attitude) in five content domains for Italian populations, our study extends basic research and provides a psychometric

service. The Italian version of the scale allows for additional cross-cultural comparisons of risk propensity and its contributing variables.

The results of the current study seem sufficient to support continued use of the DOSPERT-I, although improvement may be necessary for confident scale use in discerning smaller differences. Perhaps items developed specifically for an Italian population—rather than developed for an American population and translated from English— would be more effective in tapping the same dimensions.

Although employing new methodology can at times be risky, our study does have several broad and exciting ramifications. It illustrates the utility of investigating heterogeneous clusters of risk takers to further our understanding of the psychological processes that determine and motivate risky behavior, as well as their effects on the experimental results.

The level of analysis we utilize here also avoids the pitfalls associated with aggregating data across participants from different underlying populations and simultaneously avoids the dependencies and low power that plague individual analyses.

The current results suggest that taking risks is largely mediated by the perceived benefit of the activity, and to a lesser extent by the perceived risk. Needless to say, our data do not allow one to explain risk-taking behavior solely on account of the perceived benefit and/or riskiness, since people might have many other motivations to participate in various activities. However, referring to the results derived from this research, the gathered data inform us that probably female civil servant engage in more risk behavior than male civil servant because usually in Italy, the families are single income. This country characteristic, make possible that in families where the wife is engaged in a work, the economic situation of the family grows and is more possible to have investment decisions.

Moreover, male civil servants engage more frequently in recreational behavior than male entrepreneurs. This result derives from the difference in hours of work in which are constrained entrepreneurs and people employed in public administration.

The fact that male entrepreneurs fear more about recreational hazardous decisions may depend on the “reputational” factor that involves more male professionals than other categories.

FUTURE DIRECTIONS

Additional work is necessary to determine the relative impact of the costs and benefits in risk-taking behavior. The current study has shown how such work can be done in a domain-specific manner —by targeting the subsamples of interest.

However, it is important to increase the number of items of every domain. Second, the psychometric instrument of DOSPERT needs a more clear distinction between investment, recreational, and gambling domains. Maybe, the solution will be the creation of new items focused on the culture of each country.

Finally, it will be interesting to know how the personality trait of risk changes during the life of a person and how this trait embeds the result of a life of risk behavior.

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