RISK AND RETURN RELATIONSHIP: THEORY AND EVIDENCE

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Abstract

There is evidence that risk and return are not positively related. Higher risk does not necessarily imply higher return. Evidence from Australian capital market is presented.

Introduction

Expected utility theory tells us how a decision maker **should** combine utility (value) and probability when they make decisions under risk (uncertainty).[1] One consequence of the expected utility theory is that higher risk should always be associated with higher (expected) return. However, Maurice Allais and others have shown that choices people do make are not consistent with the expected utility theory.

Prospect theory looks at individual decision making somewhat differently.[2] It has been shown by Kahneman and Tversky (and others) many of the routine violations of the expected utility theory can be accommodated by Prospect Theory. What concerns us here is what prospect theory says about risk and return: Prospect Theory implies that higher risk will be associated with higher return above a reference point and higher risk associated with **lower** return below a reference point.

There are two parts to the theory. (1) Target: There is a "target" that a decision maker takes into account (2) Above the target, the behaviour is "normal" in the sense that higher risk will be associated with higher return. However, below the target, people will behave in a risk loving fashion and hence produce higher risk associated with **lower** return.

Why is a "target" so important? Human decision process in many dimensions tend to pin down a target around which other decisions are measured. Consider optical illusions. They are examples of setting targets (or "framing" effects) in visual dimension. Similarly, our decisions under uncertainty are moderated by targetting.

To clearly see consequence of targets in our decision making under uncertainty, let us consider the following example. You are confronted with two prospects:

Prospect A has 10% chance of winning $1,000,000 and 90% chance of winning nothing;

Prospect B has 10% chance of losing $800,000 and 90% of winning $2,00,000.

Which prospect looks more attractive? Most people find A more attractive than B. However, both A and B have exactly the same mean and *variance* . Clearly, the prospect of losing money makes the difference. To put it differently, in this example, people decide with an implicit target of zero dollars. This example highlights two points: (1) mean and variance are not sufficient in the choice of prospects for most people given sufficiently stark alternatives; (2) either implicitly or explicitly people tend to anchor their decisions under uncertainty on some targets.

Evidence from Australian Industries

I used the Centre for Research in Finance (CRIF) of the Australian Graduate School of Management database of the Annual Report Record (1977-1985). The database contains records of all the publicly traded companies in Sydney Stock Exchange over the period. The classification of companies are made according to the ASIC two digit codes. More recent figures are not available as the updating of the Annual Report Record was discontinued at the end of 1985 by CRIF. The number of companies in total was about 1,000.

As a measure of risk, I take standard deviation of the firm's returns. Standard deviation and mean have the same unit of measurement. The use of ordinary least square is more reliable in such a situation.

Table 1: Australian Share Market (1977-85)

fitted equation : standard deviation of return = a + b(average return) + error

# of firms	below median			above median		
	a	b	R^2	a	b	R^2
30	21*	-0.8*	0.22	17*	-0.0	0.01
37	22*	-1.1*	0.32	0.4	1.6*	0.20
10	11*	-1.6*	0.92	-0.8	1.5*	0.46
15	19*	-1.5*	0.70	-31	2.9*	0.35
31	16*	-1.3*	0.50	5.4	0.1	0.01
20	71*	-7.9*	0.77	-4*	0.6*	0.70
17	19*	-1.3*	0.33	3	0.3	0.03
25	12*	-0.8*	0.26	3	0.2	0.01
19	12*	-0.4	0.06	10	-.1	0.01
10	15*	-1.2	0.09	1.3	0.2	0.01
10	15	-1.3	0.04	0.5	0.3	0.04
36	16*	-1.5*	0.36	-3.3	1.0*	0.17
33	17*	-0.6*	0.32	4	0.3	0.01
48	17	-1.6*	0.37	0.0	0.6*	0.29

* denotes a statistically significant coefficient at 5%.

References

Allais, M. 1953. Le comportement de l'homme rationnel devant le risque: Critique des postulates et axiomes de l'ecole americaine. *Econometrica*, 21, 503-546.

Bowman, E. 1982. Risk seeking by troubled firms. *Sloan Management Review*, 23, 33-42.

Crum, R., Laughhunn, and Payne, J. 1981. Risk seeking behavior, and its implications for financial models. *Financial Management*, 10, 20-27.

Fiegenbaum, A. 1990. Prospect theory and the risk return association: An empirical examination of 85 industries. *Journal of Economic Behavior and Organization*, 14, 187-203.

Kahneman, D. and Tversky, A. 1979. Prospect Theory: An analysis of decision under risk. *Econometrica*, 47, 263-291.