Some Implications of the Friedman-Savage Hypothesis

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> «Whether or not they realize it and whether or not they take explicit account of the varying degree of risk involved, individuals choosing among occupations, securities, or lines of business, are making choices analogous to those that they make when they decide to buy insurance or to gamble.»
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> Milton Friedman and Leonard Savage «The Utility Analysis of Choices Involving Risk», *Readings in Price Theory*, American Economic Association, page 58.

We propose to elaborate on the above statement as it relates both directly and indirectly to occupational choice. Specifically, we will show that under Friedman-Savage assumptions it is possible to rationalize certain patterns of labor mobility and various «irrational» choices regarding education as well.

The basic model is as follows :

Consider an individual faced with alternatives.

$A = aI_1 + (1-a)I_2$, $0 < a < 1$, and
$B = aI_0$, $a = 1$, $I_2 > I_0 > I_1$, I being money income.

The expected utility of A, $U(A) = aU(I_1) + (1-a)\,U(I_2)$, the utility of B being $U(I_0)$. A will be chosen, B will be chosen, or the individual will be indifferent between them as $U(A) \gtreqless U(I_0)$ respectively.

«Average Income», $I(A) = aI_1 + (1-a)I_2$ and if equal to I_0 makes the gamble or insurance «fair». If, nonetheless, A is chosen,

it is evident that we can set $\overline{U}(A) > U(I)$, and if B is chosen we can set $U(A) < \overline{U}(I)$.

Now introduce I^*, an income with the property $U(I^*) = \overline{U}(A)$. If the utility function describing choice in this situation is a monotonically increasing function of income this implies that if

$$\overline{U}(A) \gtreqless U(\overline{I}), \quad \text{then} \quad I^* \gtreqless I.$$

The positive difference $(I^* - \overline{I})$ thus measures the individual's preference for gambling, or maximum «casino entrance fee», while a negative difference measures the individual's preference for insurance, or maximum «premium».

The condition that $I^* > \overline{I}$ for «gamblers» is shown in the right-hand diagram of Figure 1-a utility function with monotonically rising marginal utility for money income. The left-hand diagram depicts the case of an «insurer» - a utility function with monotonically falling marginal utility for money income.

We now turn to the case of an individual faced with the alternatives

$$C = .5I_1 + .5I_4 \quad \text{and}$$
$$D = .5I_2 + .5I_3, \quad \text{wehere} \quad I_4 > I_3 > I_2 > I_1.$$

Figure 2 is drawn so that $\overline{I}(C) = \overline{I}(D)$. But, it can be seen that, since I^*C must be $< I^*C$, $\overline{U}(C)$ must be $< \overline{U}(D)$, and the individual will choose alternative D.

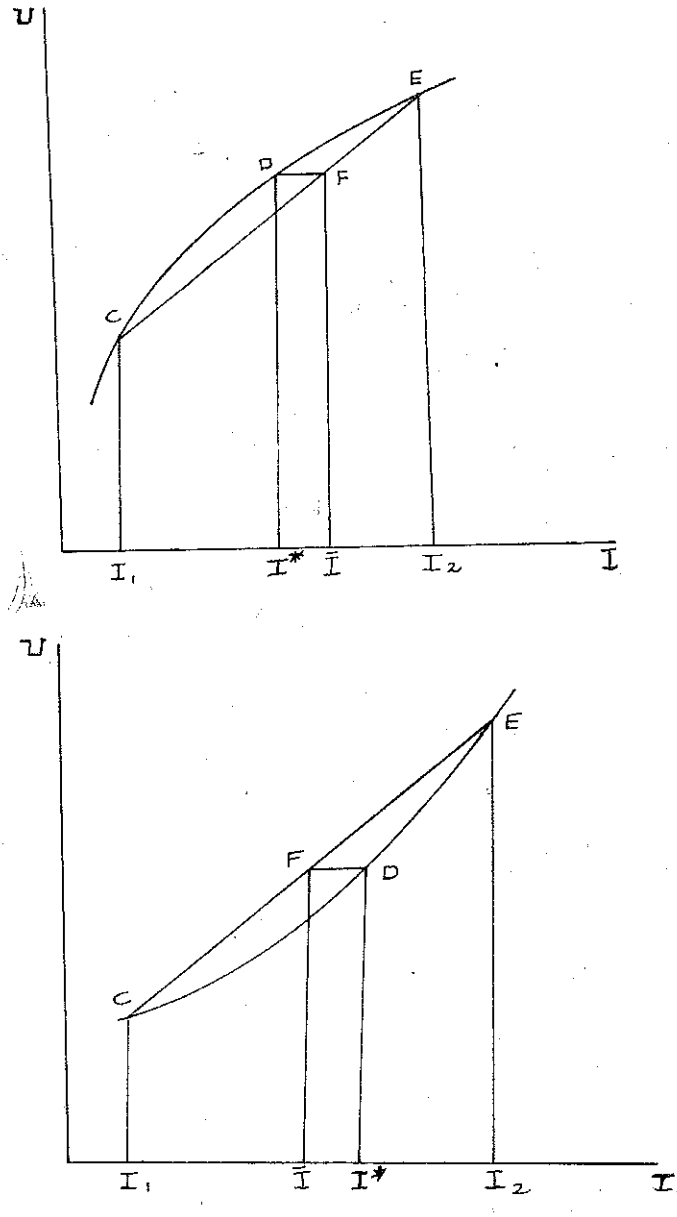
Let the individual now face alternatives

$$D = .5I_2 + .5I_3 \quad \text{and}$$
$$E = aI_1 + (1 - a)I_4.$$

These alternatives are shown in Figure 3, which is drawn so that $U(D) = \overline{U}(E)$ and, therefore, $I^*D = I^*E$. But, for this to be true $I(E)$ must be $> I(D)$, implying $0 < a < .5$.

We interpret these results as follows :

In the first case (alternatives C and D), even though the actuarial values of the gambles were equal, the individual chose the alternative with the smaller income dispersion. This follows immediately from the assumption of diminishing marginal utility and the geometry of the requisite utility function. In the second case (alternatives D and E), a higher average income was needed to compensate for a wider dispersion of income. This also follows immediately



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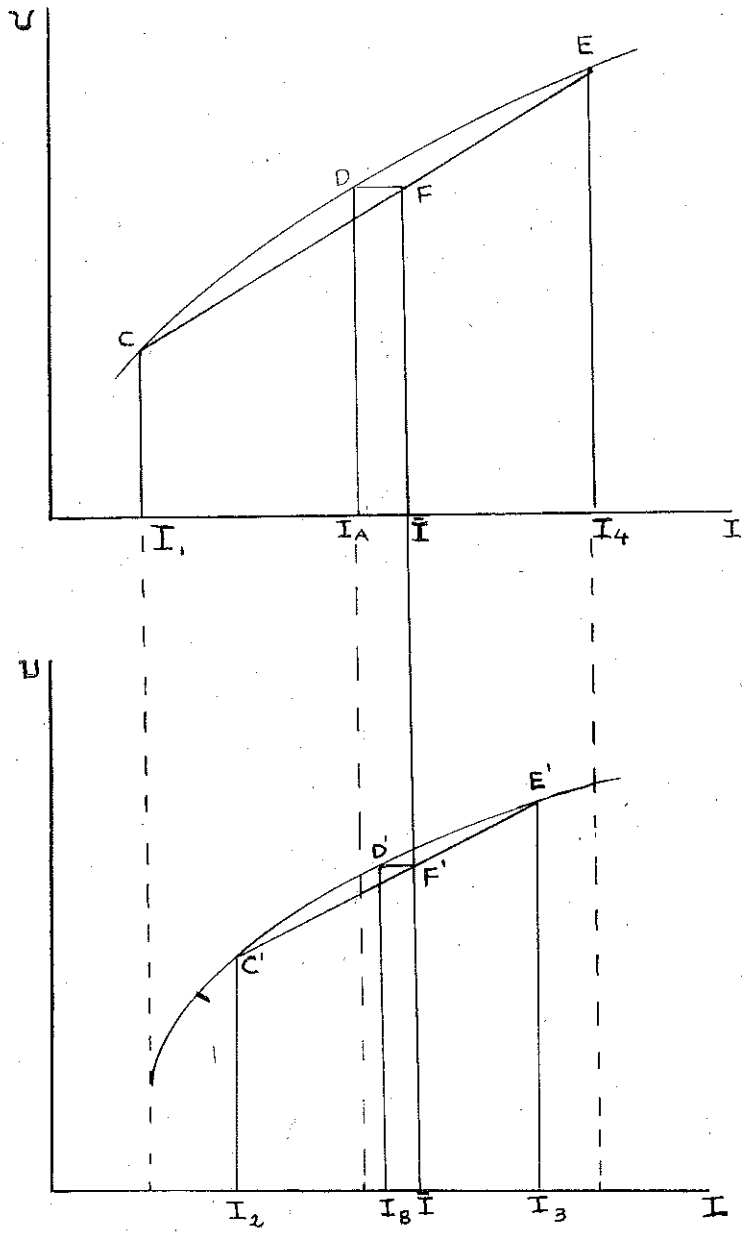

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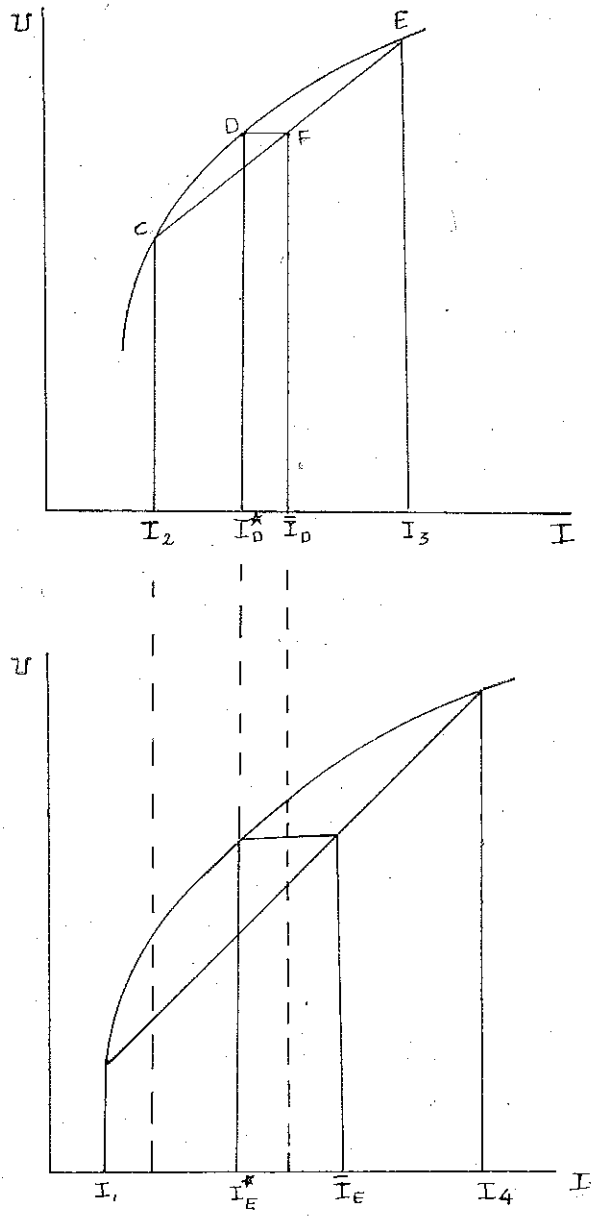

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from the assumption of diminishing marginal utility and the geometry of the utility function. If income dispersion is made to stand for «risk» or an index thereof, our individual could well be described as a «risk-avoider» or «insurer».

In the case of an individual whose choices are described by a utility function where marginal utility is monotonically rising, the above conclusions are suitably reversed. We do not illustrate this case.

What conclusions can be drawn from the foregoing? The most obvious is that under certain conditions Friedman-Savage choice-makers regard income variance as a prime decision variable. The implications of this, among many that could, no doubt, be drawn are: a) some labor mobility patterns which do not make obvious «sense» can be explained persuasively in Friedman-Savage terms, and b) educational drop-outs of certain sorts are rationalized in similar terms.

Canadian data on present values of lifetime earnings reflect the rather curious fact that, though intra-occupational differences over time tend to narrow, inter-occupational differences remain fairly constant. In conventional analysis this can be explained as an «equilibium» situation representing the existence of «transfer costs» of occupation change. In our analysis this is (better) explained by the particular relation between individual preference functions incorporating a risk variable and the empirical pattern of earnings size and variance by occupation. Admittedly, until data such as the Canadian are examined in an actual test of the above implications the model of choice presented remains crucially incomplete. We hope, however, that our suggestions provide the theoretical framework upon which such investigation can be based.

Of what relevance is our model for the behavior of individuals making educational choices? Precisely this: if an individual drops out of higher education (or secondary, for that matter) even though he is intellectually and financially qualified to continue, *in spite of* the fact that his education will most likely yield a return higher than an investment in physical capital, it is possible that the income alternative to education is subjectively more certain than the increment to income due to an investment in education, i.e. its variance is less. Furthermore, if the purchase of an education involves the willingness to accept a gamble with a higher variance than other alternatives (choosing an education is seen as a surrogate for choosing

an occupation or range of occupations), it also implies, for an individual with a Figure 3 type of preference function, that a higher average return is demanded. Thus, to the extent that individuals can be described as «insurers», we must expect the occurence of «irrational» desertion from the educational system of individuals whose risk-avoiding predilection make such behavior «rational» in our terms.

Some implications for public policy, at least in the United States, which can be generated from the above are:

Some risk involved in the purchase of education could be reduced by making available more and better information concerning expected returns. One likely publication which could benefit from greater detail is the federal government *Occupational Handbook*, used as a career guide by many. It is quite possible that the creation of more reliable data sources would reduce the average variance of income gains expected from education relative to other income sources and a rise in its average return.

Risk-sharing schemes might be devised. Insurance in the form of education subsidies from sources other than public agencies, in particular from private firms, seems perfectly feasible. Thus, self-liquidating (on the average) loans to students might go a long way towards reducing the subjective risks involved in «committing» oneself to an education and a resultant bounded set of job alternatives. (This suggestion is Friedmanian in another, obvious sense.)

Fiscal and monetary policies designed to achieve employment levels would make it harder to find job alternatives to education, thus increasing the risks involved in dropping-out of Academy. The other side of the coin is, of course, that the higher opportunity costs involved (income and employment are highly positively correlated) make it more attractive, *cet. par.*, to drop out. The two effects may or may not cancel, and which is dominant in the latter case is empirically unclear.

Finally, the elimination of racial and other forms of discrimination in relatively unskilled and, therefore, relatively low-education-intensive jobs tends to make education more attractive by increasing the competition for such jobs. It might also make education more attractive through the widening of employment opportunities.

The above conclusions are woefully vague in the absence of data to confirm or refute each assertion, but our contribution, if any, will be to point out those areas where our model might direct such empirical research with relatively high pay-offs.

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November 25, 1968