Actions towards food safety: choosing labels or self-protection

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1. Introduction

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2. Objectives

- Provide theoretical rationale of consumers’ optimal choices of different protective behaviors so as to meet their demand for food safety.
- Treat a protective behavior as a production process with a special focus on the cost.
- Deeply discuss the mixed effects of factors that affect consumers’ protective behaviors, with a special focus on the factor ‘income’.

3. Theoretical Model

3.1 Expected Utility Framework:

\[ EU = \pi(U_x, Y) + (1 - \pi)U_s(X, Y) \]

where: 
- \( U_x \) is the primary food item.
- \( U_s \) is the secondary food item.
- \( T \) is the household’s total time endowment for working.
- \( \pi \) is a wage rate.
- \( A \) is a non-wage income.

3.2 Household Productive Framework:

\[ \min C = w(t_1 + t_2) + p(z_1 + z_2) \]

\[ S.T.: \quad m = m(t_1, z_1, a) \]

where:
- \( S.T. \) is the household’s total time endowment for working.
- \( \pi \) is the wage rate.
- \( A \) is the non-wage income.
- \( m(t_1, z_1, a) \) is the production technology.

3.3 Pursuing Food Safety —— Get the optimal level of protective behaviors:

\[ EU = \pi(U_x, m) - U_s + U_f \]

where:
- \( U_f \) is the utility of self-protective behavior.
- \( m(t_1, z_1, a) \) is the production technology.

4. Empirical Model

4.1 Bivariate Tobit Model:

\[ y_i = \begin{cases} \beta_i x_i + \epsilon_i, & i = 1, 2, \ldots, n, j = 1, 2 \end{cases} \]

where:
- \( y_i \) is the dependent variable.
- \( x_i \) is the independent variable.
- \( \epsilon_i \) is the error term.

5. Results

5.1 Comparative static analysis:

- With respect to behavior production technologies:
  \[ \frac{\partial m_t}{\partial w} = \frac{\partial m_t}{\partial A} = -C_m \frac{\partial m_t}{\partial A} \]

- With respect to wage rate:
  \[ \frac{\partial m_t}{\partial w} = \frac{\partial m_t}{\partial A} = -C_m \frac{\partial m_t}{\partial A} \]

5.2 Propose two hypotheses:

- Behavior production technologies have positive effects on the corresponding protective behavior.
- Non-wage income has positive effects on both protective behaviors, nevertheless the wage rate will discourage self-protective behavior and prompt label-choosing behavior.

6. Conclusion

- Behavior production technologies have significant positive effects on the corresponding protective behaviors. This finding has important policy implications for those aimed at improving consumers’ levels of protective behaviors.
- Mostly importantly, income has mixed effects on the protective behaviors. Non-wage income works purely to increase the level of protective behaviors as long as they are normal. The effect of wage-income, however, is much more complicated.