

Figure 3. Engel curve with a non-linear budget constraint.

market. Hence per capita free market demand is

$$s \int_{x_T} \{g(x, p_0)Z, p, Z\} dF(x) \quad (110)$$

$$\frac{as}{aZ} = \frac{\int \{t(p_i - p_0)Z, p, p_i - Z\} f(x_T) dF(x)}{\int \{t(p_i - p_0)Z, p, p_i - Z\} f(x_T) dF(x)} \text{ which,} \quad (111)$$

from the definition of  $x_T$  is simply

$$\frac{as}{aZ} = \int (p_i - p_0) dF(x). \quad (112)$$

Since, at the extensive margin, consumers buy nothing in the free market, only the intensive margin is of importance. Note that *all* of these estimations and calculations take a particularly simple form if the Marshallian demand functions are assumed to be linear, so that, even in this non-standard situation, linearity can still greatly simplify.

The foregoing is a very straightforward example but it illustrates the flavor of the analysis. In practice, non-linear budget constraints may have several kink points and the budget set may be non-convex. While such things can be dealt with, e.g. see King (1980), or Hausman and Wise (1980) for housing, and Reece and Zieschang (1984) for charitable giving, the formulation of the likelihood becomes increasingly complex and the computations correspondingly more