

## Appendix: WIC Model Symbols

M	the number of supermarket chains in a local market area
$c_k$	marginal cost to the supermarket chain for formula brand $k$ ( $k = 1, 2$ )
$C_{k,i}$	total cost of brand $k$ ( $k = 1, 2$ ) for chain $i$ ( $i = 1, \dots, M$ )
$q_{k,i}$	quantity of brand $k$ formula sold by chain $i$ ( $i = 1, \dots, M$ )
N	the number of households in a local market area that use formula
H	high-income households, used to represent both their number and their type
L	low-income households, used to represent both their number and their type
$q_{k,j}$	quantity demanded for brand $k$ formula ( $k = 1, 2$ ) by type $j$ households ( $j = L, H$ )
$P_k$	supermarket price for brand $k$ formula ( $k = 1, 2$ )
$a_k$	price-independent demand parameter (intercept) for brand $k$ formula
u	demand parameter that measures the tag-along effect
$b_j$	own-price demand parameter (slope) for type $j$ households ( $j = L, H$ )
s	cross-price demand parameter
z	a household's saturation level of formula (and the WIC allocation)
$q_{k,W}$	quantity demanded for brand $k$ formula ( $k = 1, 2$ ) by WIC households
v	the fraction of vouchers that a representative WIC household redeems in supermarkets
$\theta_k$	the share of supermarket formula demand by a representative WIC household that is provided by brand $k$ formula ( $k = 1, 2$ )
$\delta$	dummy variable that equals 1 if WIC formula is distributed through the food delivery distribution system and zero otherwise
$Q_k$	Market demand for the supermarket sector for brand $k$ formula ( $k = 1, 2$ )
$A_k$	market-level term equaling $(H + L)a_k$
U	market-level term equaling $(H + L)u$
B	market-level term equaling $Hb_H + Lb_L$
S	market-level term equaling $(H + L)s$
$Q_W$	market-level WIC demand for all formula
D	the ratio of the number of discount stores to total population
h	a constant of proportionality relating U to $Q_W$
$\alpha$	a derived parameter
$\beta$	a derived parameter
$\gamma$	derived parameter
Y	the number of non-WIC households
w	the ratio of WIC to non-WIC households that buy formula
b	the group-weighted average of price sensitivity terms $b_H$ and $b_L$ , if WIC is present
$b_0$	the group-weighted average of price sensitivity terms $b_H$ and $b_L$ , if WIC is absent