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An Economic Model of WIC, the Infant Formula Rebate Program, and the Retail Price of Infant Formula

Mark Prell

Abstract

This report develops an economic model that provides the theoretical framework for the econometric analyses presented in the report's companion volume, *WIC and the Retail Price of Infant Formula* (FANRR-39). The model examines supermarket retail prices for infant formula in a local market area, and identifies the theoretical effects of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and its infant formula rebate program. Special attention is given to the rebate program's sole-source procurement system by which a single manufacturer becomes a State's "contract brand"—the State's one supplier of formula to WIC infants—in exchange for paying rebates to WIC. When a manufacturer's brand is designated a State's contract brand, the model predicts that supermarkets increase that brand's retail price. The model also predicts that an increase in the ratio of WIC to non-WIC formula-fed infants in a local market results in an increase in the price of the contract brand and, through demand substitution, a relatively small price increase for noncontract brands.

Keywords: WIC program, infant formula, cost containment, rebates, food package costs, Special Supplemental Nutrition Program for Women, Infants, and Children, child nutrition, food assistance

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Summary

This report develops an economic model to examine supermarket retail prices for infant formula in local market areas, and to identify the theoretical effects of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and its infant formula rebate program. The model adapts a multi-firm Cournot oligopoly model to a new setting that incorporates two differentiated products: heterogeneous consumers segmented by income, and the roles of WIC and its rebate program. This report provides the theoretical framework for the specification and interpretation of the econometric model presented in the report's companion volume, *WIC and the Retail Price of Infant Formula* (Oliveira et al., 2004).

Using this framework, the influence of WIC in a local market area is measured by the *relative size of WIC*, defined as the ratio of WIC to non-WIC formula-fed infants. While non-WIC consumers are sensitive to the price of formula, WIC households are not price sensitive because they do not pay for formula out of pocket. Holding other factors constant, the model predicts that as the relative size of WIC increases, retailers increase infant formula retail prices. The model also predicts that retail prices depend on the type of contract used by the WIC State agency to procure infant formula. Currently, WIC State agencies use competitive bidding to award a contract to a single manufacturer of infant formula for the exclusive right to provide its product to WIC participants in the State. Under sole-source or exclusive-rights procurement, *all* of the WIC demand is channeled to the formula provided by the contract-winning manufacturer and *none* of the WIC demand goes to other national brands. When the retail price of the formula made by the contract-holding manufacturer increases due to an increase in the relative size of WIC, some non-WIC households respond by switching to other infant formula brands. The retail prices of these other infant formula brands increase as a result, although by a smaller amount than the initial price increase of the contract-holding manufacturer's formula.

The report also examines how retail prices can be affected by different types of distribution systems; socioeconomic factors; the degree of competition faced by the supermarket *sector* (inclusive of all supermarkets) due to the presence of discount stores; the degree of competition faced by a supermarket *chain* (which may own one or more stores) due to the presence of other supermarket chains; and a formula manufacturer's wholesale cost. The model focuses on the retail markup, treating manufacturers' wholesale prices for infant formula as exogenous.