Reply to Prof. Bresnahan

by Jerry Hausman, MIT and NBER

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In his comments on my paper "Valuation of New Goods under Perfect and Imperfect Competition" (1996), Prof. Bresnahan agreed with the basic approach but he raised two potential problems. Since he raised neither of these potential problems in his discussion of the paper at the NBER conference in Williamsburg nor did he send me a copy of his comments before publication, I reply to his comments in this short note. Neither of his potential problems has any importance in reality.

Indeed, Prof. Bresnahan's main contention that successful new goods in differentiated product markets may not create significant consumer welfare is easily seen to be incorrect, given an understanding of basic economics and the data. The consumer value from a new good arises from the difference between the virtual price and the market price in the expenditure function for the representative consumer. The virtual price is determined by the slope of the compensated demand curve (i.e. the second derivative of the expenditure function) and the quantity of the new good sold. For a successful new good with a significant quantity sold, unless the slope of the compensated demand curve is very low which implies a very high price elasticity, the new good will create significant additional consumer welfare because the virtual price will exceed the market price by a significant amount. Moreover, we know that the price elasticity is not extremely high for most differentiated products given the well known relatively high values of price to marginal cost ratios found in differentiated product markets. Thus, in most situations, new differentiated products which sell significant quantities will lead to a significant increase in consumer welfare.

I. Choice of Instruments

Prof. Bresnahan questions the validity of the instruments used in my demand estimation because of the possible presence of nationwide shocks to demand. I believe that he fails to understand the econometric specification because both Tables 5.3 and 5.4 include display variables which typically capture period specific advertising campaigns by cereal manufacturers. His other assertion that demand may shift over time and not be captured by the model specification is also incorrect because geographic specific time trends are also included separately for each MSA. These additional variables are included among the instruments. Indeed, given the panel nature of the data, I have included month specific indicator variables to capture potential shocks not captured by the time trends with no change in the main result of the slope of the demand curves.

Another check on the econometric results is provided by a recent Harvard Ph.D. thesis by Aviv Nevo, "Demand for Ready-to-Eat Cereal and its Implications for Price Competition, Merger Analysis and Valuation of New Brands" (1997). Dr. Nevo uses the Berry, Levinsohn, and Pakes (1995) discrete choice approach to estimate an aggregate model of cereal demand. He includes national advertising expenditures in his model specification (Table 5.3) which should account for Bresnahan's major criticism. He also uses an alterilatiV6 set of instruments which concentrates on costs of production. Nevo's average reported price elasticity is -2.95 (Table 5.4) and the average weighted average price elasticity is significantly lower since large selling brands such as Corn Flakes are estimated to have significantly lower pr. elasticities. The estimated price elasticity for Honey-Nut Cheerios is -2.7. this v-alne is somewhat higher, but quite similar to my estimate for Apple-Cinnamon Cheerios of -2.2. Both would be "me too" products according to Prof. Bresnahan (p. 239), but both products would lead to significant increases in consumer welfare, contrary to Prof. Bresnahan's view of new product demand. Thus, both my results and Dr. Nevo's results imply significant increases in consumer welfare from successful new cereal products and are consistent with observed price cost margins in the cereal industry.

II. Nash-Bertrand Calculations

In my paper I also pointed out that introduction of a new product by a multi-product manufacturer can lead to higher prices on its other products in a model of imperfect competition. To compute the effect, I used a first order linear approximation, equation (15), since the overall effect is likely to be small. Prof. Bresnahan does not appear to understand that a first order approximation which is the first step of the Gauss-Seidel method for solving a system of nonlinear equations will give quite accurate results for small changes.[1] In a recent paper, Hausman and Leonard (1997), 1 compared the first order method with the exact method and found the results to be similar. I would have been glad to share these results with Prof. Bresnahan if he had sent me his comments before publication. Here I have re-computed the results of my cereal paper using the exact method to solve for the new equilibrium in prices under the assumed Nash-Bertrand behavior of my paper while allowinkhe elasticities to change when moving to the new equilibrium.

[1]Indeed, for the price elasticities estimated in the paper, the Gauss-Seidel method converges rapidly.

I now recalculate Table 5.7 from my paper to compare the first order approach with the exact approach:

Table 1: Approximate and Exact Estimation of Price-cost margins

Without Apple-Cinnamon Cheerios

	Brand	Approximation (Paper)	Exact
1.	Cheerios	.5251	.5236
2.	Honey-Nut Cheerios	.5096	.5077

The results in Table 1 are quite close whichever technique is used--Cheerios differs by .0015 and Honey-Nut Cheerios differs by .0019. In terms of the change in the price-cost margin due to the introduction of Apple-Cinnamon Cheerios which I discuss in the paper, the exact calculation for Cheerios yields an increase of 0.61% while the first order approximation used in the paper yields an estimate of .032%. For Honey-Nut Cheerios the exact method yields an estimated change of 2.45% while the first order approximation used in the paper finds an estimated change of 2.10%.[2] As expected, the Cheerios change continues to be small while the Honey-Nut Cheerios and Apple-Cinnamon Cheerios. For the expected small changes, the approximate and exact calculations lead to quite similar estimates.

III. Conclusions

New consumer products which are successful lead to significant gains in consumer welfare. This outcome follows from the basic economics and from the observation that the product would not be successful if it were too much like existing products. Both my results and Dr. Nevo's results lead to significant gains from new brand introductions. The exact and first order Bertrand results also lead to similar results which is to be expected given the small expected changes from the multiple brand situation when a single new brand is introduced.

In terms of the overall effect on the COLI I estimate that the CPI overestimates the true COLI by a 1.2 percentage point amount per year while Dr. Nevo estimates the difference to 1.1 percentage points per year. These estimates are quite close given the two different econometric models used to estimate the demand systems and to do the welfare evaluations.

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[2]Note that in the paper I state that the change for Honey-Nut Cheerios in 3.0%, but I used the incorrect divisor in that calculation. However, no other calculations change in the paper.