Demand Paper

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Abstract

Nonparametric econometric analysis has been a growing field of study over the past few decades. Many new techniques have been developed within a theoretical framework. However, despite the rapid growth of theoretical results, nonparametric applied research has lagged considerably. This paper employs a nonparametric regression analysis within the context of demand theory. Data on prices and quantites of three commodities (meats, dairy products and beans) from the 2006 Ecuadorian consumer expenditure survey will be evaluated to derive Marshallian price and income elasticities. The nonparametric results will be compared with standard parametric demand analysis tools such as the Log-Log demand model and the Almost Ideal Demand system to guage the effectivness of using nonparametric techniques to estimate demand elasticities.

1 Introduction

This may be due in part to the advanced mathematical and statistical exposition presented in many nonparametric research papers. It is often difficult for economist, while well trained in advanced mathematical techinques, to fully grasp the significance and translate from purley theoretical results into applied research. Theoretical researchers working within the field of mathematics and statistics often fail to consider applied economic problems and applied economist are not exploring these newly developed theoretical techinques and refining the theory once they have touched real world data. In addition, until recently, nonparametric techniques were substantially more computationally intensive compared to their paramteric counterparts. While the previous statement would seem to imply that nonparametric tecniques have now become computationally less intesive, in reality it is our computer hardware and programing techniques which have improved to the point where nonparametric analysis has become a viable alternative, especially where parametric techniques fall short. These improvemnts in computer hardware have effectivly opened an area of research which, until recently, had remained closed.

Table 1: Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Max
obs	2,066	1,033.500	596.547	1	2,066
p1	2,066	2.610	0.820	0.365	11.351
p2	2,066	1.231	1.510	0.011	23.736
p3	2,066	1.218	0.444	0.010	4.386
q1	2,066	4.498	3.011	0.001	38.574
q2	2,066	6.244	5.635	0.001	63.762
q3	2,066	0.943	0.929	0.0004	14.074
p1q1	2,066	11.395	7.883	0.003	98.101
p2q2	2,066	4.619	4.215	0.001	51.451
p3q3	2,066	1.073	1.088	0.0005	15.250
X	2,066	17.087	10.679	0.199	128.602
w1	2,066	0.657	0.168	0.001	0.984
w2	2,066	0.269	0.159	0.0001	0.945
w3	2,066	0.074	0.070	0.00003	0.884

good 1 = meats
good 2 = dairy
good 3 = beans

2 Methods and Models

3 Results and Discussion

Table 2: Parametric - Double Log Demand Model

	meats	dairy	pulses	income_elasticity	R-squared
meats_lnq1	-0.9073***	-0.07323***	-0.003844	1.164***	0.74226
dairy_lnq2	-0.05847	-0.8216***	-0.07056*	1.004***	0.64494
pulses_lnq3	-0.3804***	-0.05684*	-0.4394***	0.5658***	0.14743

***Significant at the 1 percent level,
**Significant at the 5 percent level,
*Significant at the 10 percent level.

4 Conclusions

Table 3: Nonparametric Regression using Gaussian Kernel

	meats	dairy	pulses	income_elasticity	R-squared
meats_lnq1	-0.9674***	-0.06514*	-0.04756	1.124***	0.88725
dairy_lnq2	0.002597	-0.843***	-0.0752***	0.9875***	0.71745
pulses_lnq3	-0.3402***	-0.05632**	-0.7777***	0.4965***	0.27586

***Significant at the 1 percent level,
**Significant at the 5 percent level,
*Significant at the 10 percent level.

Table 4: Full AIDS - Marshallian

	meats	dairy	pulses	income_elasticity	R-squared
meats_lnq1	-0.9813***	-0.06048***	-0.03157**	1.073***	0.067727
dairy_lnq2	-0.06908***	-0.8626***	-0.03394***	0.9657***	0.052564
pulses_lnq3	0.1063	0.006219	-0.5657***	0.4532***	0.13459

***Significant at the 1 percent level,
**Significant at the 5 percent level,
*Significant at the 10 percent level.

5 References