

Milk Marketing Order Winners and Losers

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Our Objective

- determine the distributional effects of milk marketing orders
- determine whether the policy is regressive

Milk Market

- not a textbook competitive industry
- affected by 3 government programs
 - dairy price supports
 - import quotas on dairy products
 - milk marketing orders

History

- for several decades, supports, quotas, and marketing orders jointly determined farm, wholesale, and retail prices for milk and manufactured products
- by the mid-1980s:
 - price supports had become essentially irrelevant to market outcomes in the dairy industry
 - trade policy was renegotiated in the 1986 GATT Uruguay Round

Marketing Orders

- most states covered by federal milk marketing order (FMMO)
- 4 state orders (only Virginia's and California's orders completely replace federal orders)
- milk marketing laws cause “price discrimination” (classified pricing)

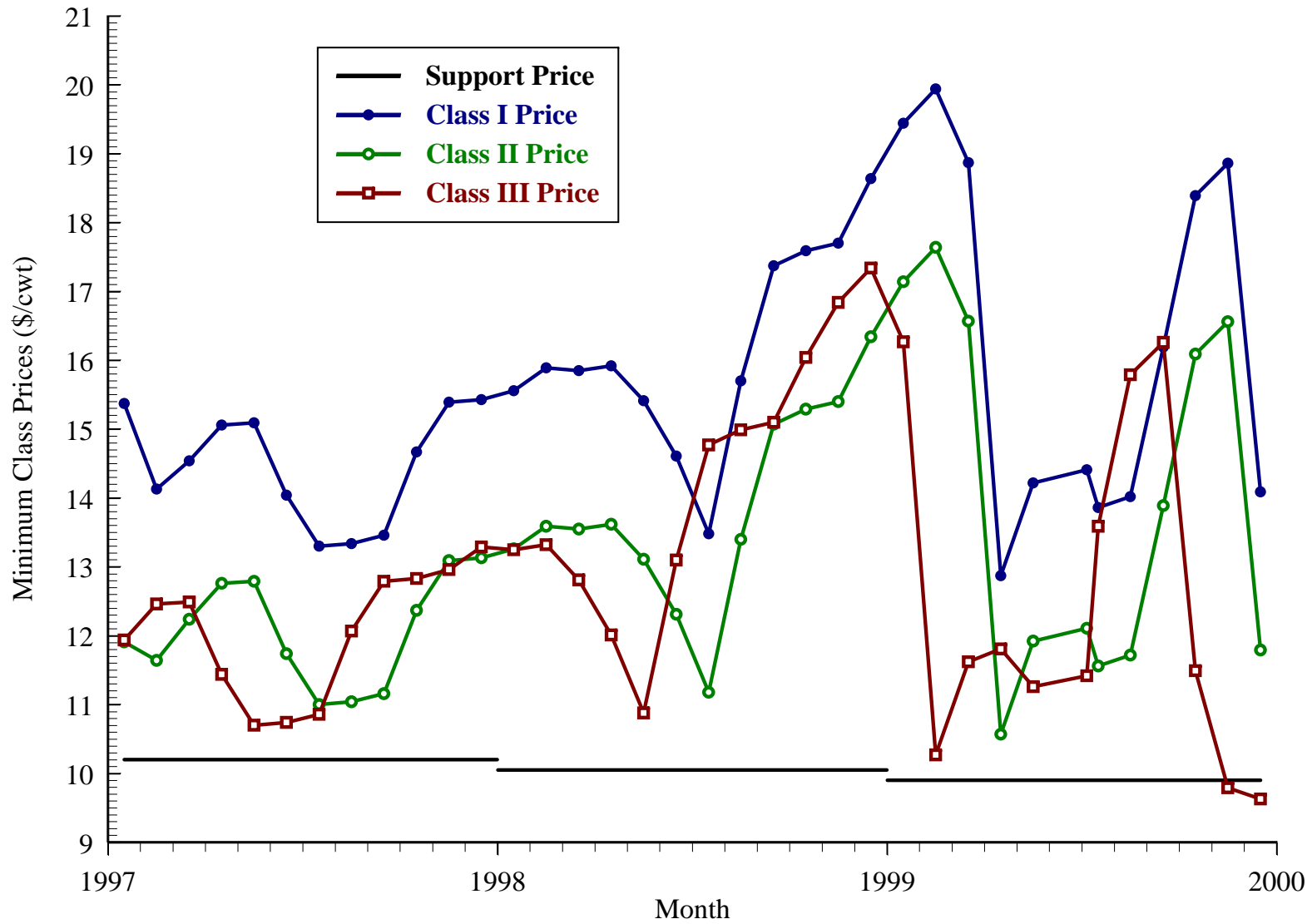
Price Discrimination

- Class I milk: fluid beverage products.
- Class II milk: used in soft dairy products such as ice cream, cottage cheese, and yogurt
- Class III milk: used in hard dairy products such as butter and cheese
- Class III–A milk: used to manufacture nonfat dry milk

FMMO History

- Federal Agriculture Improvement and Reform Act of 1996 mandated reforms to the FMMO program
 - changed the way that minimum prices paid to farmers were determined
 - consolidated the number of FMMOs from 42 to between 10 and 14 by January 2000
- 1997–1999 was a significant transition period

Figure 1. Federal Milk Marketing Order Minimum Prices, 1997-1999



Price Differentials 1997-1999

- minimum Class III FMMO price = basic formula price (BFP)
- minimum Class II price = BFP from two months previous + \$0.30/cwt
- average minimum Class I price = BFP + \$2.60/cwt
- average farm-level prices:
 - Class I \$15.58/cwt
 - Class II \$13.04
 - Class III \$12.91
 - farm-level FMMO blend price \$14.04/cwt
- average dairy support price \$10.05/cwt

Empirical Study

- scanner data: weekly city–level purchases of dairy products matched with demographic characteristics of the purchasing households in 22 cities
- prices adjusted for taxes
- program’s transition period of 1997–1999

Estimation model

- generalization of AIDS: linear and quadratic in prices, linear in income (LQ-IDS)
- nonlinear 3-stage least squares estimation
- includes city-level demographic variables:
 - ethnicity
 - home ownership
 - employment status
 - occupation
 - age and number of children in the household
 - education and age of household heads
 - income

Incomplete Demand System

- consistent with utility theory: consistent estimates of elasticities and welfare measures
 - 2 primary differences w/ complete demand system
 - budget constraint is an inequality
 - demand for the $n+1^{\text{st}}$ good is not forced to have exactly the same functional form as the included goods
- can be made complete by identifying the demand for expenditure on other goods through the budget identity

NL3SLQ

- 856 instruments
- 819 structural parameters
- total of 3,588 cross–section/time–series observations per demand equation
- given 14 demand equations, 50,162 total observations

Estimation Model's Properties

- has null hypothesis of zero for each price and income elasticity (cf. AIDS: null is -1 for own-price and 1 for income)
- flexible with respect to price and income effects
- satisfies necessary and sufficient conditions for a rational, representative consumer in each city

14 Products

- *milk*: non-fat, 1% milk, 2% milk, whole
- *cream/creamers*: dairy cream (including half and half), coffee creamers
- *spreads*: butter and margarine
- *ice cream* (including frozen yogurt and ice milk)
- *yogurt*: cooking (plain and vanilla yogurt), flavored
- *cheese*: cream cheese, shredded and grated, American and other processed cheese, natural

Disaggregation affects Substitution

- whole, 2%, 1%, and nonfat milk should be close substitutes
- if price of 2% milk $>$ average of whole and nonfat milk prices, mixing two half gallons of whole and nonfat gives 1.9% milk at a reduced cost
- thus, we expected *ex ante* (and found) larger estimated own-price elasticities of demand than in studies w/ more aggregated products

Welfare

- we use the carefully estimated demand system to calculate equivalent variation of milk marketing orders by demographic groups
- check whether policy is regressive

Previous Loss Estimates

- 2 studies: average annual consumer surplus losses due to marketing orders 1970s-mid 1980s
 - \$700 million (\$1967)
 - \$3.6 billion (\$2000)
- 3 studies: social costs of \$175 million, \$25 million and \$70 million per year, respectively (\$1967)

Previous Pricing Studies

- raw milk prices would fall nearly 20% in the absence of marketing orders
- if retail pass-through is 100%, retail prices would also decrease 20%
- eliminating the New England Dairy Compact, which acted much like a marketing order, would result in a 4% to 70% decrease in fresh milk prices

Eliminating Milk Marketing Orders

- general agreement on effect on fluid milk, some minor dispute about effect on manufactured dairy prices
- we consider 3 scenarios:
 - milk -20%, manufactured no change
 - milk -20%, manufactured +5% increase
 - averages of literature's estimates

Percentage Change in Quantity

	p	Q	p	Q	p	Q
1% Milk	-20	32.9	-20	32.7	-15.5	25.0
2 % Milk	-20	12.2	-20	12.9	-15.5	9.5
Nonfat Milk	-20	8.8	-20	9.6	-15.5	7.4
Whole Milk	-20	9.2	-20	6.8	-15.5	6.8
Fresh Cream	0	1.3	+5	2.1	1.25	0.8
Natural Cheese	0	0.6	+5	-0.9	0.5	0.2
Cream Cheese	0	0.3	+5	-3.8	0.5	-1.1
Butter	0	-1.4	+5	-1.8	-3.0	-0.3
Ice Cream	0	1.0	+5	1.2	-1.0	1.9
Flavored Yogurt	0	-0.1	+5	-2.7	1.25	-1.0

Equivalent Variation (\$/week)

	0%	5%	literature
Mean	1.44	0.63	2.94
White	1.50	0.68	2.96
Non-white	0.96	0.23	2.10
Income=\$10,000	1.73	0.80	3.84
Income=\$50,000	0.94	0.33	1.41
Income=\$90,000	0.15	-0.14	-0.92
Young Child (0-5.9)	1.68	0.76	3.88
No Children	1.69	0.84	2.83
Family with 3 Children (\$20K)	1.25	0.70	5.77
Childless Couple (\$60K)	0.22	-0.37	3.34

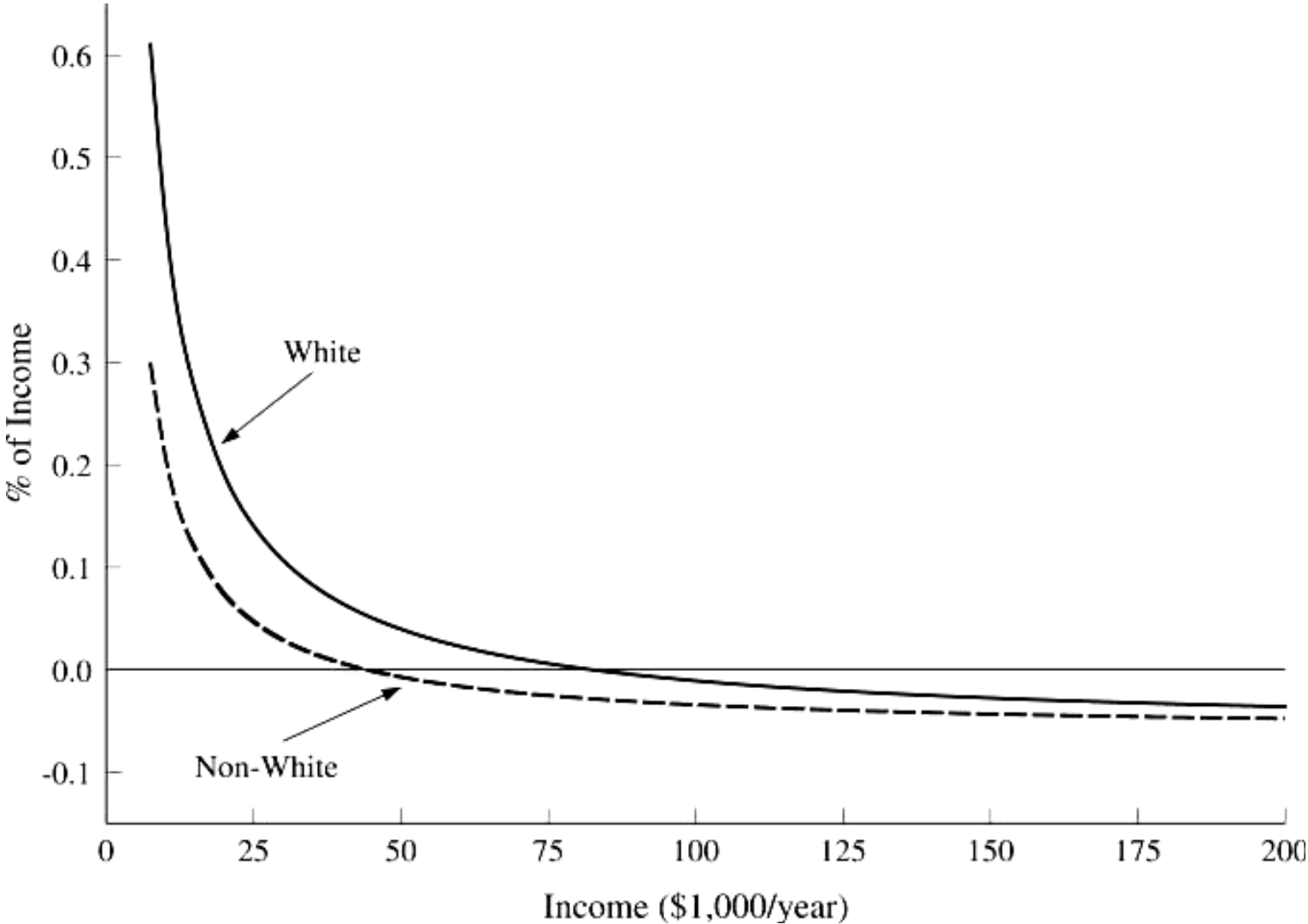
Regressive

- marketing orders are highly regressive
- fall disproportionately on the poor

Regulatory Burden

- regulatory burden: household's annual equivalent variation from removing the marketing order divided by its annual income
- look at the regulatory burden from 20% decrease in fluid milk prices and 5% increase in manufacturing prices
- the following figure compares the regulatory burden as a function of income for White and Nonwhite families

Distribution of Regulatory Burden for Federal Milk Marketing Orders



Conclusions

- milk marketing orders *harm widows and orphans* (raises fluid milk price)
- *help yuppies* (lowers triple cream cheese, premium ice cream prices)

Harm

- luckily the losses are relatively small per average household:
 - \$2.94/week
 - \$152.88/year
- total harm to society (given 100 million HHs buy dairy products): \$15.3 billion