Resale Price Maintenance: Output Increasing or Restricting? The Case of Distilled Spirits in the United States

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Theories of resale price maintenance (RPM) differ strongly on the pro- and anticompetitive effects of RPM. There are few tests of the welfare gains or losses from RPM in industry case studies. This paper tests RPM's welfare effects in the retail sale of distilled spirits in the US. Using regression analysis to estimate demand, comparing liquor store license values over time, and analyzing political contributions, the study finds that efficiency arguments for RPM are unsupported, with RPM leading to a reduction in distilled spirits consumption. Evidence shows substantial wealth transfers from consumers to retail liquor store owners due to RPM.

I. INTRODUCTION

PROPONENTS OF resale price maintenance (RPM) argue that it promotes efficiency by protecting against free riding on both product specific and storewide retailer services. Opponents of RPM argue that it fosters manufacturer and retailer cartels, induces wasteful expenditures on marketing, and inhibits the adoption of more efficient distribution networks.[1] The debate ranges widely over such issues as the welfare effects of RPM, alternative theories of RPM, the likelihood of cartelization, and whether the many efficiency explanations of RPM are credibly supported.

Largely missing in the debate are empirical tests of alternative theories of RPM, such as tests of efficiency gains versus monopoly welfare losses. This paper offers some empirical tests of RPM, focusing on a major area of conflict: whether RPM serves to protect retailer special services or to effect a retailer cartel. These theories are tested in a study of distilled spirits at the retail level in the US. The findings show that the more prominently mentioned efficiency arguments lack logical plausibility in the retail sale of distilled spirits and, more importantly, lack empirical support. Contrary to efficiency arguments, we find that RPM led to a reduction in consumption and thus to a potential monopoly welfare loss. Evidence shows that rent

[1] The vast literature on RPM is exhaustively reviewed in Overstreet [1983]. Recent versions of the debate are in Comanor and Kirkwood [1985], Marvel [1985], Overstreet and Fisher [1985], Sharp [1985], and White [1985].

seeking motivated the continuation of RPM in the case of liquor stores and resulted in a substantial wealth transfer from consumers to retail store owners.

II. RPM: OUTPUT INCREASING OR RESTRICTING?

II(i).   *Efficiency theories of RPM*

The product-specific special service theory of Telser [1960] has been found wanting in recent years. For many recent examples of products using RPM, such as underwear, raincoats, automobile parts, and shoes, no special service requirements can be readily identified (Overstreet [1983]). Attempting to remedy this, recent papers expand the special service theory from product-specific to storewide services. Marvel and McCafferty [1984] argue that dealers with established reputations act as agents for consumers, screening out low quality goods and selecting high style goods. RPM, coupled with sellers' refusal to sell to low quality stores, blocks free riding on dealer reputation and ensures product adoption by the optimal distribution network. Klein and Murphy [1986] posit that RPM provides an income premium to dealers that ensures compliance with manufacturer wishes owing to the threat of dealer termination. Any behavior that affects product quality or detracts from maximizing manufacturer sales is said to be controllable by RPM. Similar arguments are offered by Goldberg [1984], who adds buying shelf space to RPM's purposes.

II(ii).   *Testing for efficiency effects*

Once service theories become storewide and not product-specific, they are far more difficult to test as sources of efficiency gains. Given the multitude of services offered by retailers, RPM under storewide theories can always be rationalized as pro-competitive. However, a simple enumeration of potential services offered by retailers is not convincing, since by themselves they indicate neither changes in demand nor in consumer welfare.

Estimating RPM's effects on output is a possible test of efficiencies. RPM-induced consumer benefits should shift demand outward or reduce price elasticity at existing output levels. Our test will be output changes. Such changes are at the heart of all efficiency theories of RPM and can be clearly contrasted with rent seeking output restrictions.[2]

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[2] The welfare implications of an output increase for a single producer with RPM is in dispute. It is theoretically possible for RPM to induce an increase in output but nevertheless decrease welfare. See Comanor [1985], Marvel [1985], Scherer [1983], Mathewson and Winter [1983], and White [1985]. But an RPM-induced decrease in output should imply a decrease in welfare in most cases.

II(iii). *RPM and rent seeking*

Two conditions signal potential competitive problems: industrywide RPM and government mandated RPM. If RPM fails to increase a manufacturer's output, that is largely his problem. When output fails to increase under industrywide RPM, it suggests possible anticompetitive behavior: either a manufacturer or retailer cartel (Ornstein [1985]). Industrywide RPM instituted by manufacturers is, however, also consistent with the attainment of efficiencies by all manufacturers, who may share a common distribution technology. Examples of common firm efficiencies include guarding against product quality degradation (e.g., ethical drugs and fast food franchisees), seeking specialized outlets or an optimal number of outlets (e.g., designer label products), or gaining economies of scale in distribution (e.g., soft drinks and beer). In contrast, when there are broad differences in market segments, product quality, channels of distribution, and outlet types, industrywide RPM to effect efficiencies is suspect.

The use of government by private interests to administer mandatory, industrywide RPM raises further suspicions. Government imposed market restrictions are an invitation to rent seeking. They provide retailers and politicians with potential wealth gains if (along with increased price) entry and various forms of nonprice competition, such as advertising and promotions, tie-in sales, and hours of sale, are controlled.

The special interest group behind industrywide, government administered RPM is important in assessing its anticompetitive potential. As just noted, industrywide RPM generated by manufacturers may be due to efficiencies common to all firms in an industry. But to make RPM effective, it must be mandatory on all retailers. Further, government enforcement may minimize overall enforcement costs. But, in turn, this may provide the opportunity for retailer rent seeking. Hence, while the origin of RPM may be efficiency based, its government administration may subsequently be captured by rent seekers. Thus, in practice, the distinction between voluntary and mandatory RPM instituted by manufacturers can become blurred. Mandatory RPM sought by retailers is less ambiguous: it is almost always for anticompetitive purposes. Identifying the origins of RPM or who controls it in a state is, however, a difficult task.

III. EFFICIENCIES AND THE SALE OF DISTILLED SPIRITS

III(i). *Analyzing efficiencies*

Where RPM exists in the sale of distilled spirits, it is mandatory and industrywide (Distilled Spirits Council of the United States [1974]). However, the commonly mentioned RPM efficiencies for distilled spirits—product specific and store wide services, product quality preservation, and ensuring an optimal distribution network—are not plausible explanations. Product

specific information, such as taste and quality, is available through low cost direct experience. Product information and brand image through advertising comes primarily from manufacturers (*Liquor Handbook* [1979]). Retail distilled spirits advertising consists almost exclusively of price advertising.

Retail liquor stores compete on numerous nonprice grounds, such as hours of sale, brands available, shopping convenience, and so forth. Storewide services of this nature are not subject to free riding, nor do they require RPM to assure their provision. Stores seeking repeat purchase customers have sufficient incentives to provide courtesy, cleanliness, etc. All stores have an incentive to carry the leading brands, with or without RPM, and to carry minor brands according to customer tastes.

Product quality is assured without RPM. Products are sold under Federal seal with high penalties for tampering. Degrading a product entails loss of a license to sell, which is a prohibitive cost. Product quality is further assured before products reach retailers by manufacturer brand name capital, federal bottle labeling laws, and pure food and beverage laws.

A more plausible RPM efficiency explanation in this case is to establish an optimal distribution network (Gould and Preston [1965]; Gallini and Winter [1983]). By restricting price discounting, RPM results in a relatively large number of small outlets, restrained in number by retail economies of scale and state limitations on number of licenses. Over time, however, economies of scale in distribution and retailing, and lower consumer shopping costs will favor larger, more efficient stores, or chain operations. Economies of scale in retailing can come from quantity discounts, chain store advertising, and, with higher sales volume, more efficient use of buildings and fixtures. As economies grow, RPM will block such gains, to the detriment of manufacturers. However, eliminating RPM will lower the value of retail liquor licenses, so retail trade associations will fight its repeal.

Although we are skeptical of efficiency claims for RPM in the sale of distilled spirits,[3] we recognize that the importance of services, such as brand coverage (analogous to book sales, where RPM was long used), store image, and so forth is arguable. This highlights the need for empirical testing.

III(ii).   *Testing for efficiencies*

Four tests of RPM's efficiency effects are presented: a consumption test on whether RPM increases or decreases consumption; a distribution network test of RPM's relationship to retail economies of scale; a license value test of the effect of RPM on liquor store license values; and a political contribution test of whether contributions by special alcohol interests are consistent with rent seeking or efficiency promotion.

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[3] Our arguments apply only to distilled spirits. Beer and wine may require services for maintaining product quality or providing information.

Consumption test. If RPM has demand-increasing effects, it should be reflected in higher *per capita* consumption in RPM states. Conversely, if RPM is part of rent seeking via alcohol control laws, it should be associated with lower *per capita* consumption.

We estimated a demand equation to test the impact of RPM on distilled spirits consumption across all license states for the period 1974–1978 (Ornstein and Hanssens [1985]).[4] The demand equation includes economic, socio-demographic, and legal control variables identified in prior demand estimation studies on distilled spirits (Ornstein [1980]). The model estimated did not include a supply equation since costs, absent transportation costs, are relatively constant across states. Spirits are produced in a few states and shipped nationwide, or they are imported. More importantly, roughly three-quarters of all states have most-favored-nation laws for spirits, requiring spirits manufacturers to sell to wholesalers at the lowest price sold in any other state. Excise taxes do differ across states, but they are included in the price variable.

Using a pooled time-series, cross-section sample of 185 observations, regression results (with *t*-values in parentheses) for RPM and other key explanatory variables of *per capita* consumption are:[5]

$$\begin{array}{l} \textit{Per capita} \quad = 0.627 - 0.081 \textit{ RPM} - 0.614 \textit{ Price of} \\ \textit{consumption} \quad (0.70) \quad (2.45) \qquad (3.94) \textit{ spirits} \end{array}$$

$$\begin{array}{l} + 0.042 \textit{ Lowest adjacent} + 0.576 \textit{ Income per} \\ (4.67) \textit{ state price} \qquad (3.92) \textit{ capita} \end{array}$$

$$\begin{array}{ll} + 0.273 \textit{ Tourism} & R^2 = 0.89 \\ (13.0) \end{array}$$

The results show that the presence of RPM is related to a *decrease* in *per capita* consumption of about 8 percent. This is diametrically opposite to efficiency explanations for RPM in spirits.

Distribution network test. The optimal distribution network theory is weakened if RPM forecloses economies of scale. A crude indicator of scale effects comes from comparing the population served by off-sale liquor outlets

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[4] In the US distilled spirits are sold under either private license or state monopoly ownership.

[5] The variables are measured as follows: state consumption in gallons per 14 years of age and older; RPM is a dummy variable equal to one if present and zero otherwise; price is a weighted average of eight leading brands in each state; adjacent state price is the ratio of lowest adjacent state price to own state price, divided by own state size; income is real *per capita* state income; and tourism is annual state payroll in hotels, motels, and tourist courts divided by total state payroll. The full model is not reported to save space but it included variables for urbanization; age distribution of the population; Christian religious affiliation; mean temperature; minimum legal drinking age; number of outlets; bans on billboard advertising, price advertising, and novelty-give aways; and the legality of Sunday sales, sales in drug stores and sales in grocery stores. The measure of consumption is debatable. If RPM improves the quality mix of consumption, then quality-adjusted consumption may be higher in RPM states. Unfortunately, the data do not allow adjustments for quality changes.

in RPM and non-RPM states. Using our sample, the average number of people per off-premise outlet in ten non-RPM states in 1978 was 3309, while in seven RPM states it was 2422. RPM appears to have blocked the attainment of scale economies in liquor retailing.[6] This finding is also consistent with evidence on drug stores, where RPM was widely used. The average size of drug stores in RPM states in 1963 was significantly smaller than drug stores in non-RPM states (Marvel and McCafferty [1984]).

License value test. If RPM exists because of retailer rent seeking, an end to RPM would result in declining liquor store license values. Of course, if RPM exists for efficiency reasons its loss would also lower license values as industry sales decline. However, the loss should be less in the latter case since retailers would be affected more or less equally. More importantly, substitute distribution practices to protect services, such as selective dealer termination, would arise, preserving license values. If retailer rent seeking is the goal, there are no good substitutes for RPM. The average license values would fall as more efficient retailers captured sales from less efficient outlets.

We tested RPM's effect in a regression explaining license values by county in California before and after RPM was repealed in 1978. Average license values by county are available from 1970–1977, but were not collected annually after 1977. Fortunately, a special survey was conducted in 1984. Hence, the test is based on continuous annual data from 1970 to 1977, plus data for 1984. All counties with 100 000 population or above were used in order to minimize outliers due to only a few license exchanges, resulting in a sample of 31 counties.

License values in real terms are explained by the number of persons per license, real *per capita* income, a time trend variable, and a dummy variable for 1984 equal to one and representing the absence of RPM.[7] A proxy for urbanization was also tried, but the results were unstable due to collinearity and are not reported.

License values should be positively related to persons per license and to *per capita* income. The trend variable is included to account for shifts in consumer tastes toward distilled spirits. *Per capita* consumption of distilled spirits in California increased 9 percent from 1970 to 1979 but declined by 17 percent from 1980 to 1985. License values likely fell as a result. The dummy variable should be negative owing to the absence of RPM.

A logarithmic model provided the best fit on the pooled cross-section time-series data base. A Chow test for parameter homogeneity failed, resulting in

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[6] These figures are only suggestive since the number of outlets in a state is influenced by factors besides economies of scale, many of which do not lend themselves to more formal regression analysis (Kiholm-Smith [1982]). The full population of license states could not be used since in many cases a single license provides for both on- and off-premises sales.

[7] License values and number of licenses by county were provided by the California Department of Alcoholic Beverage Control. Population, income, and the CPI for California came from the *California Statistical Abstract, 1984.*

TABLE I
REGRESSIONS EXPLAINING OFF-SALE GENERAL LICENSE VALUES
IN CALIFORNIA COUNTIES

	Equations	
	VC	OLSDV
Intercept	13.43	
	(6.13)	
Persons per License	1.42	1.78
	(10.13)	(7.15)
Real Per Capita Income	0.44	0.62
	(2.07)	(2.33)
Time	−2.02	−2.61
	(−3.52)	(−3.94)
Year 1984	−0.29	−0.26
	(−3.74)	(−3.21)
R^2	n.a.	0.85
N	279	279

t-value in parentheses.

the use of variance components (VC) and, alternatively, OLS with dummy variables for each county (OLSDV).

The results, seen in Table I, are consistent with expectations. Persons per license and *per capita* income are positively related to license values. The trend variable is negative, reflecting the decline in distilled spirits consumption. Most importantly, the repeal of RPM had a significant negative impact on license values. The reduction in license values due to the absence of RPM is estimated to be between 23 and 25 percent (Halvorsen and Palmquist [1980]). This finding is consistent with RPM being used to establish supra-competitive retail prices.

Political contributions test. If the decline in license values represents a monopoly rent loss to retailers and not a demand reduction owing to a loss of services, it should be reflected in contrasting lobbying efforts of manufacturers and retailers. Indeed, the history of state alcohol regulation presents a classic example of the interest group theory of regulation. Rents are created by legislation, and politicians allocate these rents across groups to maximize voter support (Becker [1983]). The nature of alcohol regulations in each state, such as the level of taxes, bans on advertising, and bans on price competition, reflect the political strength of opposing interests by retailers, wholesalers, manufacturers, and temperance groups (Kiholm-Smith [1982]). Anticompetitive restrictions sought by retailers conflict with manufacturer goals of sales increases and should be reflected in opposing lobbying efforts.

Lobbying expenditures and campaign contributions in primary and general elections in California are given in Table II. These figures understate total contributions since they do not include all alcohol interests, such as

TABLE II
CAMPAIGN AND LOBBYING EXPENDITURES (US $) BY ALCOHOL INDUSTRY GROUPS IN CALIFORNIA

	1975–76	1977–78	1979–80	1983–84
Anheuser–Busch	0	5 150	24 456	238 765
California Beer Wholesalers Association	52 995	94 312	134 937	214 790
California Retail Liquor Dealers Association	154 029	133 665	65 945	55 484
California Association of Winegrape Growers	0	9 739	26 756	62 264
Coors Brewing Co.	0	17 000	21 968	0
Distilled Spirits Council of the US	12 090	12 195	21 275	79 024
E & J Gallo Wine Co.	63 143	54 637	98 949	0
Malt Beverage Industry Welfare Fund	32 880	61 998	51 950	0
Miller Brewing Co.	0	11 100	0	109 213
Wine & Spirits Wholesalers of California	75 050	114 440	146 163	233 235
Wine Institute	81 133	124 318	133 074	300 860
Total Expenditures	471 320	638 554	723 473	1 293 635

Sources: Derived from State of California, Fair Political Practices Commission, *A Report on Lobbying*, 1976, 1978, and 1980; State of California, Fair Political Practices Commission, *Campaign Contribution and Spending Report*, Primary and General Elections for 1976, 1978, and 1980; and, State of California, Fair Political Practices Commission, *Report on Lobbying 1983–1984*.

restaurants, hotels, and affiliated labor unions. They also exclude other often sizeable expenditures, such as paying politicians for speeches or hiring a politician's law firm. The figures are consistent with RPM's support coming from retailers and not from manufacturers. Expenditures increased during the period covered for almost all special interests. The contributions of wine and spirits wholesalers rose sharply, as did those of spirits manufacturers through their trade arm, the Distilled Spirits Council of the US. But expenditures of the Retail Liquor Dealers Association, which clearly had the greatest stake in RPM, were quite different. Retail liquor dealers' expenditures declined over the period and dramatically so after 1978 when RPM on distilled spirits was repealed by the California Supreme Court. In real terms, retail liquor dealers contributions fell more than five-fold, from $154 029 in 1975–76 to $29 517 in 1983–84. Hence, it appears quite likely that the bulk of the dealers' contributions in the 1970s were to support the continuance of RPM. These findings support the view that the fall in license values reflects a loss in monopoly rents, not in services to consumers.

IV. MONOPOLY WELFARE LOSSES

Given the finding of output restriction, it is instructive to estimate the size of the potential monopoly welfare loss. All estimates of monopoly welfare losses

are controversial because of difficulties in measuring price elasticity and monopoly price increases and because of their static nature (Scherer [1980]; Rice and Ulen [1981]). Nonetheless, some welfare loss estimates are offered, rough as they may be, since informed public policy requires evidence when analyzing the costs and benefits of regulations.

IV(i). *A simple welfare model of control laws*

Estimating welfare changes from restricted consumption requires examining the trade-off between reduced social costs from lower drinking and monopoly welfare losses generated by anticompetitive control laws. A model is presented in Figure 1. Assume demand D for a hypothetical alcoholic beverage industry, along with marginal private costs, MC_p, and marginal private plus social costs, MC_{ps}. Under competitive conditions price is P_1 and output is Q_1, resulting in a social loss of P_2UVP_1. The socially optimal price P_2 assumes that each drinker contributes to the negative externalities of drinking in direct proportion to the amount purchased and enforcement costs are zero. However, internalizing social costs at P_2 is unlikely. Drinker contribution to
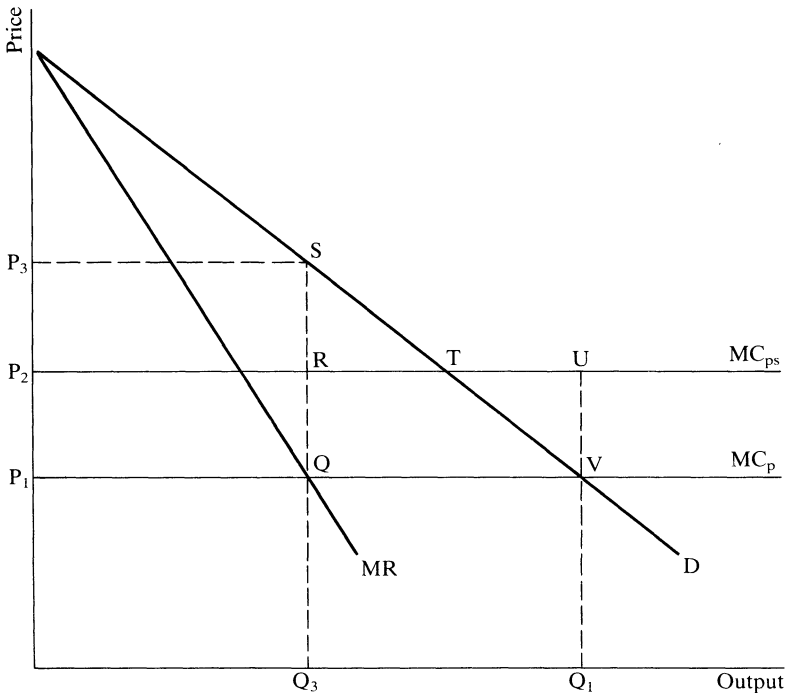

Figure 1
A Welfare Model of Restrictive Alcohol Consumption

negative externalities is not necessarily in direct proportion to purchases. Alcohol purchases are sometimes shared and often used as gifts. In addition, drinking distribution is highly skewed; 10 percent of drinkers account for 40 to 50 percent of all consumption (Cook [1981]). Under the plausible condition of increasing returns in externalities, a uniform price will not efficiently internalize the social costs of drinking. It will understate the externalities produced by some drinkers and overstate the externalities produced by the vast majority of drinkers. For drinkers who create no externalities, deadweight losses from state regulations come in many forms, including higher nominal prices, higher transaction costs from reduced hours of sale, and a suboptimal number of stores. Using a public interest theory of regulation, the vast majority of non-problem drinkers are unlikely to allow the price to be set at the socially optimal level.

Both state monopoly control and private licensing are compatible with monopoly pricing P_3. If $P_2 < P_3$, a welfare trade-off exists between the deadweight monopoly loss, SRT, and the social cost savings, TUV, from pricing at P_3. Unfortunately, measuring these areas is not feasible with present knowledge. If $P_2 \geq P_3$ there is no trade-off, but (as was just argued) a state is unlikely to set $P_2 \geq P_3$.

To summarize, there are two unknowns on pricing: whether P_2 is greater or less than P_3 and whether price is actually at P_2 or P_3? We hold that a uniform P_2, whether above or below P_3, will not fully internalize externalities and is politically infeasible. The theoretical P_2 to internalize social costs may be at or above P_3, but, again, it may not be politically feasible to set a high enough price. At present public alcohol revenues are far less than estimated social costs from drinking. Social costs for 1975 were estimated to be $43 billion (US Dept. of Health, Education, and Welfare [1978]), while total public revenues from alcoholic beverages were $9.7 billion, of which $6.3 billion came from distilled spirits (Distilled Spirits Council of the United States [1977]). Though these figures pertain to total costs and total revenues, it seems unlikely that marginal tax rates are at high enough levels so that the marginal social costs of alcohol use are fully incorporated in the price.

Two areas in Figure 1 can be estimated: SQV, an overestimate of the deadweight monopoly loss, and P_3SQP_1, the potential monopoly rents to retailers.[8] The latter rents, in turn, are partially dissipated through payments to politicians. The level of political expenditures depends on expected retailer rents, free riding problems in collecting contributions for politicians, and the magnitude of opposition group expenditures. The opportunity costs of these expenditures represents social costs (Posner [1975]). These latter losses may

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[8] We are assuming that $P_2 > P_3$ and that P_2 is not being set. Politicians are choosing between P_1 (non-RPM) and P_3 (RPM). Taxes are determined on considerations other than internalizing negative externalities. An alternative welfare analysis, examining the imposition of an externality correcting tax on either a monopoly or under conditions of perfect competition, but not comparing competition with monopoly as in Figure 1, is in Buchanan [1969].

be the most significant when rent seeking underlies various alcohol control laws, such as RPM.

The traditional deadweight monopoly welfare loss, DWL, can be measured by:

$$(1) \qquad DWL = \tfrac{1}{2}(e_p)(Q_m/P_m)(P_m - P_c)^2$$

where e_p is industry price elasticity, Q_m is monopoly output, P_m is monopoly price, and P_c is competitive price. The estimated loss, SQV, is an overstatement of the true DWL because of the social cost savings from reduced drinking. As stated, area $RTVQ$ cannot be estimated. Measures of e_p, Q_m, and P_m for distilled spirits are available, but P_c is unknown. By specifying an equation explaining prices across states, regression analysis can be used to estimate the price differential $P_m - P_c$ due to RPM.

IV(ii). *Price differences across states*

The price of distilled spirits is postulated to differ across states due to the presence or absence of RPM, the presence or absence of price advertising, state excise taxes, the level of income, the extent of tourist travel, and the degree of urbanization. We focus on estimating price differentials due to RPM and the absence of price advertising: the other variables are used as controls. With the exception of taxes, these are all demand variables. As noted earlier, supply side variables, other than taxes, are essentially constant across states, so a single, reduced form equation is used to explain price. The hypothesized relationships are as follows.

In the absence of price advertising, the mean level of price and price variance are higher. Consumer search costs are raised, leading to increased local monopoly power. Hence, price will be higher where price advertising is banned.[9] Examining the effects of advertising restrictions is more than academic. In 1983 legislative proposals to ban advertising of alcoholic beverages were debated in a number of states and existing advertising bans were upheld or extended in others.[10] In 1984 Congressional hearings were held on banning wine and beer commercials on television, and alcohol advertising was investigated by the Federal Trade Commission.

Another variable affecting price is state excise taxes. Under similar conditions of demand and supply across states, adjacent state prices differ largely by differences in state excise tax levels. Taxes are also included in the regression to separate monopoly welfare effects from tax welfare effects. By holding taxes constant, increases in the gross retail price facing consumers

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[9] Tests of bans on price advertising have found this proposition to be true in the cases of prescription eyeglasses (Benham [1972]), prescription drugs (Cady [1976]), and gasoline (Maurizi and Kelly [1978]).

[10] Capital Cities Cable Inc., *et al.* v. CRISP, 699 F. 2d 490 (10th Cir.) 1983, 104 S. Ct. 2694 (1984); Queensgate Investment Co. v. Liquor Control Commission 69 Ohio St. 2d 361, 433 N.E. 2d 138 (1982).

due solely to RPM and bans on price advertising are captured. This is important, since we have no interest in measuring tax welfare losses, only monopoly losses for price gross of taxes.

The remaining explanatory variables are *per capita* income in real terms, a proxy for tourist travel, and urbanization. The higher is income, *ceteris paribus*, the higher is price.[11] Tourism's effect on price is ambiguous. States with large tourist travel centers, such as Nevada, may attempt to compete for travelers by offering lower prices on liquor and other products. However, if travel is primarily a function of other factors, such as scenic beauty or the location of financial or political centers, then the demand for alcoholic beverages may be relatively inelastic, leading to higher prices. Urbanization is used as a proxy for competition, with greater urbanization leading to lower prices.

Real price is a weighted (by sales) average of manufacturer suggested retail prices for eight leading brands in each state.[12] The independent variables are:

INCOME	*Per capita* real income.
TOURISM	Annual state payroll in hotels, motels, and tourist courts as a percentage of total state payroll.
URBANIZATION	State metropolitan population as a percentage of total state population.
RPM	Dummy variable equal to one if there is RPM, mandatory markups, or price posting from retailers to consumers (the latter two policies assumed equivalent to RPM); zero otherwise.
PRICEBAN	Dummy variable equal to one if print price advertising is allowed; zero if prohibited.
DSTAX	State excise taxes in real terms for distilled spirits.[13]

The sample covers 32 license states (two semi-license states, Mississippi and Wyoming, are missing owing to lack of tax data) plus Washington, DC for the period 1974 to 1978. Chow tests for poolability found sample homogeneity over time could not be rejected at the 0.01 level, but homogeneity cross-sectionally, tested by randomizing the states and splitting them into two subsamples, was rejected at the 0.01 level. Accordingly, regressions were estimated by variance-components analysis (VC) and OLS with dummy variables (OLSDV). The results are given in Table III.

[11] This expectation is based on the view that high income consumers prefer high quality, high priced brands, so that brand mix varies across states.

[12] The brands are: Seagram's 7-Crown, Old Crow. Old Grand-Dad, Dewar's, Smirnoff, Bacardi, Canadian Club, and Beefeater. Distilled Spirits Council of the US, 1978, 'Price per Fifth for Selected Types and Brands in License and Control States, 1973–1978', and *Liquor Handbook* [1979].

[13] Data were derived from the following sources: INCOME, *Survey of Current Business*; TOURISM, US Bureau of the Census, *County Business Patterns*; URBANIZATION, US Department of Commerce, *Current Population Reports*; RPM and PRICEBAN, Distilled Spirits Council of the US [1974, 1977]; DSTAX, Distilled Spirits Council of the US, *Distilled Spirits Industry 1978 Annual Statistical Review*.

TABLE III
REGRESSIONS IN LOGS EXPLAINING PRICE DIFFER-
ENCES IN DISTILLED SPIRITS ACROSS LICENSE STATES,
1974–1978

	Equation	
	1 VC	2 OLSDV
Intercept	1.360 (9.80)	1.467 (16.68)
INCOME	0.109 (1.56)	0.071 (1.47)
TOURISM	−0.011 (−0.72)	−0.008 (−1.21)
URBANIZATION	−0.054 (−1.98)	−0.043 (−3.19)
PRICEBAN	0.007 (0.27)	−0.032 (−2.22)
RPM	0.045 (2.19)	0.046 (3.93)
DSTAX	0.045 (3.20)	0.094 (5.59)
Alaska		0.119 (3.17)
Oklahoma		−0.256 (−8.58)
R^2	n.a.	0.55

t-values in parentheses.

The results using VC are generally as expected; higher price with higher income, with RPM, and with higher taxes, and lower price with greater urbanization. TOURISM is negative but insignificant. Unexpectedly, price advertising is insignificant. The justification for variance-components is, however, weak when a random sample of a larger population is not being used (Judge *et al.* [1980, p, 331]). An alternative is to identify the outlier states and include them as intercept dummy variables.

The diagnostics of Belsley, Kuh, and Welsch [1980] allowed identification of two states as outliers: Alaska and Oklahoma.[14] Exogenous cost factors

[14] The diagnostics showed that Alaska's strong influence derives from relatively high income. High supply costs, including high transportation costs, translates into high income for Alaska (no similar effect was found for Hawaii). Oklahoma was an anomaly during the period tested: it banned advertising, had one of the highest state excise taxes, and had one of the lowest retail price structures for leading brands. Its low prices derive from unique distribution laws, leading to one of the lowest cost wholesale distribution systems in the nation.

Oklahoma wholesalers are not agents or franchisees of any distiller and can carry any brand they desire. By concentrating on major brands, significant cost savings are achieved relative to an agent who must promote, stock, and distribute full lines of individual distillers. This allows free riding on the marketing efforts of distillers and wholesalers in other states. Cost advantages were sufficient to allow Oklahoma wholesalers to ship leading brands to independent wholesalers in California at lower prices than the wholesale price to franchised wholesalers. In 1981, about half the liquor sold to Oklahoma wholesalers was resold out of state (Los Angeles Times, Aug. 17, 1981, Nov. 16, 1981, and July 2, 1982).

influence price for both states; distance in the case of Alaska and unique distribution laws for Oklahoma. These exogenous factors are treated by separate dummy variables for Alaska and Oklahoma in equation 2. As a consequence, INCOME is no longer significant (because of Alaska), and PRICEBAN now has the correct sign and is significant (because of Oklahoma).[15] For purposes of estimating monopoly welfare losses we used the results in equation 2: a RPM price markup of 4.7 percent and a 3.15 percent markup for a ban on print price advertising.[16]

A final econometric problem to be dealt with is collinearity. For the RPM parameter to be useful it must be independent of other parameters, such as taxes. Using the collinearity diagnostics of Belsley, Kuh, and Welsch [1980] no evidence of collinearity with RPM was found.[17]

IV(iii). *Welfare estimation results*

Estimates for the price elasticity of demand for distilled spirits for the US range from zero to -2.0, with more recent estimates falling in the -1.0 to -2.0 range (Ornstein [1980]; Ornstein and Hanssens [1985]). These are averages over all drinkers. Price elasticity for those who create the bulk of social costs, the 10 to 15 percent of all drinkers, is unknown. Estimates are therefore provided over a reasonable range of elasticities: -0.5, -1.0, and -1.5. Values for Q_m and P_m in equation (1) are taken from data on existing output and price for individual states subject to RPM or a ban on print price advertising.

On the assumption of linear demand in the relevant range of output, the estimates for DWL and wealth transfers for 1978 are shown in Table IV.[18] There were ten states with RPM that, if we assume an elasticity of -1.0, incurred an aggregate DWL of approximately $5 million. There were six states that banned price advertising, resulting in an aggregate DWL of $500 000 if a price elasticity of -1.0 is used. To put these figures in the perspective of industry sales, the DWL for RPM represents 0.1 percent of total estimated retail sales of distilled spirits in 1978, while for a ban on price

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[15] Oklahoma's impact on PRICEBAN is indicated in another equation (not shown) where the dummy variable for Alaska is deleted. Oklahoma's dummy variable shows that its price is approximately 23 percent lower due to exogenous cost factors. Hence, the insignificance of PRICEBAN in equation 1 stems from Oklahoma's low price and ban on advertising.

[16] Since actual transaction prices are likely lower than suggested retail prices in non-RPM states, the RPM coefficient is probably biased downward.

[17] The tolerance value for RPM and PRICEBAN, which is measured as one minus R^2 resulting from regressing each on the other variables in the model was 0.69 for RPM and 0.64 for PRICEBAN, indicating no serious problem with collinearity. As a further test, ridge regression was run: as the ridge constant increased, the parameter estimates of all variables remained quite stable.

[18] The equation for DWL assumes linear demand while we estimated a constant-elasticity demand function. Because of the small price effects due to regulation, around 5 percent, it is safe to assume that demand is approximately linear in the relevant range of output.

Welfare Effect	Price Elasticity	RPM	Price Advertising Prohibition
Deadweight Losses	$\begin{cases} -0.5 \\ -1.0 \\ -1.5 \end{cases}$	$2 489 969 4 979 937 7 469 906	$267 852 535 703 803 555
Wealth Transfers		$226 584 050	$34 869 300

advertising the *DWL* is 0.05 percent of total estimated sales.[19] For small states with low levels of consumption, such losses are trivially small. Moreover, the *DWL* figures overestimate true *DWL* since there are offsetting social gains from reduced drinking that may be as large or even larger. Therefore, *DWL* for many states can be virtually ignored.

In contrast, wealth transfers are substantial. The total wealth transfer due to RPM was $226.6 million in 1978, which was 4.5 percent of estimated retail sales in the affected states. The comparable figure for banning print price advertising is $34.9 million, or 3.1 percent of sales in the relevant states. These are not trivial amounts or percentages since the average profit margin before taxes in 1978–79 in retail liquor stores in the United States was 2.2 percent (Robert Morris Associates [1979]).

The proportion of this wealth transfer that was pure social loss—dissipated in seeking government protection from competition and preserving government granted monopoly—is unknown. In principle, the investments in obtaining protection should continue until, at the margin, the expected gains from obtaining protection are just equal to the costs. In practice, problems arise. When group benefits are sought, serious free rider problems among sellers reduce political expenditures. Moreover, the probability that the rent seeking effort may fail reduces the expected gain and thus the initial investment in seeking protection. In addition, since perfect foresight is unavailable, no one can know *a priori* what future rents will be. Nevertheless, part of the wealth transfer will be competed away in rent seeking and in preserving such rents by subsequent campaign contributions and other payments to politicians. These payments are not completely transfers since they entail opportunity costs, induce competition to become a politician, and provoke expenditures by opposition groups. There are also the costs of state bureaucracies administering control laws. Thus, it is clear that control laws can lead to social costs.

Given the problems inherent in such welfare estimates, the results are suggestive at best. They indicate that the most significant source of welfare

[19] Sales were estimated by multiplying quantity sold in fifths by mean retail price per fifth in each state.

loss may be in resources used in political competition. An indication of the magnitude of social costs relative to wealth transfers is reflected in a comparison of Tables II and IV. Though California accounted for $71 million of the estimated $226.6 million in wealth transfers due to RPM found in Table IV, the annual contributions of California liquor store owners (shown in Table II) were less than $155 000. Even if contributions by all alcohol interests in 1977–78 are counted, they amount to less than 1.0 percent of the $71 million in transfers. This wide disparity may reflect a number of factors: the main rent seeking expenditures may occur in the periods before protective legislation passes and before the full extent of future rents is known; free riding by retailers reduces total expenditures; and rents may be obtained and preserved at far less than their total value to acquiring firms (Fisher, [1985]). Nevertheless, the figures in Tables II and IV indicate that, contrary to our speculations, the bulk of potential welfare losses were in fact wealth transfers to retailers. The pure monopoly social costs due to control laws appear to be minimal.

V. SUMMARY AND CONCLUSIONS

With deeper insights into the relationships between manufacturers and retailers, special service theories of RPM are becoming more widespread. Tests of service theories, however, have been lacking. This paper examined one case of RPM, that of distilled spirits at the retail level. No compelling evidence of RPM efficiencies was found. Evidence of output restriction, which is inconsistent with demand-increasing special services and efficiency gains, was discovered. Further estimates indicated substantial wealth transfers from consumers to retail liquor store owners as a result of RPM.

The findings indicate that in the debate over RPM and efficiency, the position expressed by some, that all historical examples of retail RPM cartels were instances of RPM used for efficiency reasons, is an overstatement. The results offer ample evidence that efficiency gains do not explain all cases of RPM. When RPM is industrywide and administered via the government, the opportunities for retailer rent seeking are ever present. Under these conditions RPM is suspect as a source of efficiency gains.

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