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Abstract

There has been a long history of government regulation related to wine marketing activities in the United States, and many regulations have been state-specific. For example, fifteen states currently have laws that restrict wine sales in grocery stores. Several of these states have recently proposed changes that would expand the distribution of wine; however, the economic implications of such changes are not well understood and the proposals have met significant resistance from key stakeholders. A simulation model is developed here to assess the likely effects of introducing wine into grocery stores in New York State. Results suggest that benefits would be generated for out-of-state wineries, government revenues, and in most cases the in-state wineries; wine sales at liquor stores would fall by 17% to 32% with this policy change. Simulation results are subsequently used to develop a framework for evaluating various proposals that would provide compensation to liquor store owners.

Keywords: Grocery stores; New York State; Rent-seeking; Simulation model; Wine sales.
JEL Classification: Q18

Introducing wine into grocery stores: Economic implications and transitional issues

1. Introduction

Thirty-five states have laws that allow wine to be available in liquor stores and grocery stores (including both food stores and drug stores). The remaining fifteen states restrict the distribution of wine, and in some cases wine is only available in liquor stores controlled by state governments.[1] Executive Budgets in 2009 included provisions to allow wine sales outside of liquor stores in Delaware, Kentucky, New York State, and Tennessee; a similar proposal was initiated in New York State in 1984. There was support for wider distribution of wine among consumers and grocery stores in these states; however, none of the proposals became legislation. In New York State, the primary objective of the 1984 proposal was to increase market opportunities for in-state wineries whereas in 2009 the proposal was included to generate additional government revenue.

It is expected that the issue of selling wine in grocery stores will be revisited again in New York State as it is the second largest wine consuming state and the fourth largest wine grape producing state (USDA-NASS, 2008). The proposals in 1984 and 2009 generated much discussion about the possible implications of introducing wine into New York State grocery stores, yet relatively little research has been completed to quantify the likely economic effects for various stakeholders. Grocery stores favored the most recent proposal (see Vote for wine, 2009), liquor stores opposed it (see Last main street store, 2009) and wine producers in New York State appear to be divided on the issue (see Frank, 2008; NYWIA, 2009). Approximately 35% of the wineries in New York State have publicly opposed proposals that would allow wine to be sold in liquor stores; however, motivations for their opposition are not clear and there are reports that liquor stores have created a "blacklist" of wineries that support the policy change (Fickenscher,

2009). To better understand the economic consequences of expanded wine distribution, there is need for a careful analysis that examines the effects of introducing wine into grocery stores for all participants in the New York State wine industry.

Other states and countries have introduced wine into food and drug stores. Social scientists, including economists, have examined the relationship between the number of outlets selling wine and overall wine consumption, and the results suggest that this relationship has been positive and in many cases significant. Table 1 provides an overview of some of the earlier work that examined the effects of introducing wine into grocery stores. Changes in the number of outlets selling wine and changes in the demand for wine are described for ten different regions in Table 1; in all regions except New Zealand more than one analysis was completed. Overall, the introduction of wine into grocery stores has increased demand for wine between 0% and 300%; the range of results is primarily due to the extent of the change and the time period considered in the analysis. Larger increases in demand were typically associated with a greater degree of liberalization and a shorter time horizon.

Washington State introduced out-of-state wine into grocery stores in 1969 and this led to a long-run increase in wine sales of 26%. Prior to 1969 out-of-state wine was only available in Washington State liquor stores. Market changes that occurred in Maine, Idaho, Montana, West Virginia, and Iowa between 1971 and 1985 shared many commonalities. In these cases, the number of outlets selling wine increased significantly and the long-run demand for wine increased between 50% and 150%. Wine was more gradually introduced into grocery stores in Alabama, and here the net long-run effect on wine sales was similar to that in Montana, West Virginia, and Iowa. Although wine was sold in a greater number of locations in New Hampshire beginning in 1978, some restrictions were maintained by the State on the distribution of wine.

The changes in wine sales reported for Quebec are much smaller than the other regions; however, the change in policy only allowed domestically produced wine to be sold in grocery stores. The effects were also smaller in New Zealand, but in this case the increase in the number of outlets was much smaller.

Although Table 1 sheds some light on the impact of selling wine in grocery stores, the individual cases do not exhibit all of the idiosyncrasies that characterize conditions in the New York State wine sector. Wine production and consumption patterns in Washington State and New Zealand may be most similar to those in New York State, yet the results from these cases will not necessarily offer much guidance for understanding the implications of introducing wine into grocery stores in New York State. The type of reform that has been proposed in New York State, and more importantly the market conditions at the time of reform, are very different than they were in Washington State in 1969 and New Zealand in 1990. To understand the implications for stakeholders in New York State, an analysis that incorporates state-specific policy details and market conditions is required. Allowing wine to be sold in grocery stores will have implications for the outlets that sell wine (liquor stores and grocery stores), wine producers (in-state and out-of-state producers), consumers, and government revenues.

2. Conceptual Model

A simple model of a wine market with four products is outlined here. Wine from two production regions is available in two types of sales outlets. More specifically, in-state and out-of-state production regions are included and wine from both are available in grocery stores and liquor stores. Out-of-state (and to a lesser degree, in-state) wines can be further disaggregated and a more realistic model would include several wine products, yet it is unclear if further disaggregation should include specific producers or regions. It is expected that some out-of-state

wine regions and producers would be major beneficiaries if wine were introduced into grocery stores in New York State. However, including only four wine products reduces several technical complexities and allows for a relatively simple model that is able to focus on understanding the key economic implications (Alston *et al*., 2009).

Figure 1 outlines the market for out-of-state wines in a region that imports a large share of the wine consumed, but also produces wine. The supply elasticity is assumed to be very elastic for out-of-state wines, and for simplicity, we illustrate it as perfectly elastic in Figure 1. The demand for out-of-state wine prior to distribution in grocery stores is denoted as D^O; introducing wine into grocery stores is expected to increase total demand for out-of-state wine to $\mathbf{D^O}$ and decrease demand for out-of-state wine sold in liquor stores to $D^O_{L.}$ With wine available in grocery stores, the quantity of out-of-state wine demanded in liquor stores would be Q^O_L and the quantity of out-of-state wine in grocery stores would be $(\mathbf{Q^O} - Q^O_L)$.

Introducing wine into grocery stores in New York State is expected to increase demand for wine produced out-of-state. The implications for wine produced in-state are less clear and will depend on a variety of factors including the size of the local industry and its reputation among consumers. Figure 2 describes two possible scenarios for the in-state wine market. The panel on the left, titled Scenario 1, considers an increase in the total demand for in-state wine from D^I to $\mathbf{D^I}$; demand for in-state wine sold in liquor stores falls to D^I_L, and demand for in-state wine in grocery stores would be $(\mathbf{Q^I} - Q^I_L)$. With upward sloping supply the increase in demand would also lead to an increase in the price of in-state wine. Over a longer time period, it is expected that in-state production would increase and this would dampen the initial price effects. Scenario 2 shown on the right panel in Figure 2 shows the market effects in a scenario with a decrease in total demand for in-state wine. In this scenario total demand for in-state wine falls,

as does demand for in-state wine in liquor stores and the price of in-state wine. These results would occur if sales of in-state wine in liquor stores fell more than the increased sales of in-state wine in grocery stores.

The two scenarios illustrated in Figure 2 highlight the importance of understanding how the introduction of wine into grocery stores would affect the demand for in-state wine. Potential demand changes for in-state wine will be explored and results for different experiments will be simulated to provide a range of results. Each experiment will begin with a specification of the total change in demand for wine given its introduction into grocery stores. Next the total shifts in demand for in-state and out-of-state wine will be calculated using information about the capacity of the in-state sector to expand, wine consumption rates, and production quantities. Shifts in demand for in-state and out-of-state wine in liquor stores will be assessed using liquor stores' share of wine sales. Data describing demand for wine in various types of outlets in New York State are not available, and using data from another region to characterize wine demand in New York may be very misleading. Both the size and nature of the shift in demand for in-state wines are important, and a range of possibilities will be explored in the simulation experiments. A crucial parameter in the model is the link between the overall demand shift for wine and the demand shift for in-state wine. We consider a range of demand and subsequent supply shifts for the four products to provide a better understanding of how the sector would most likely respond to a policy that introduces wine into grocery stores.

3. Simulation Model

A partial equilibrium model is developed here to understand the implications of introducing wine into grocery stores. The model considers a wine sector that includes four products, and the results will be used to shed some light on the likely effects of increased distribution in New York

State. Although the model is developed with the New York State wine sector in mind, it would also apply to regions that produce and import wine, and sell wine in both liquor stores and grocery stores. The model solves proportional changes in quantities and prices given a set of parameters that describe supply and demand elasticities, and product market shares for the wine sector in New York State. The simulation model also includes parameters that introduce exogenous shocks to demand for the four products as a result of allowing wine to be sold in grocery stores and subsequent supply shocks as markets respond to the policy change. Demand shocks for all types of wine are used to characterize the effects of introducing sales in grocery stores. Supply shocks are used to characterize two phenomena. First, supply may be affected by a production response to the policy change (over the short-run for out-of-state wine and over the medium- to long-run for in-state wine). Second, the policy change may affect costs in upstream markets, such as wine marketing and distribution, and this will have an impact on the supply of wine.

Equations (1) through (4) describe demand for the four wine products included in the simulation model, and equations (5) and (6) describe supply for in-state and out-of-state wine. In the equations below I is used to represent a quantity of in-state wine and O represents a quantity of out-of-state wine. The term P is used to represent the price of a wine product and superscripts I and O are used to differentiate in-state and out-of-state wine. Subscript L is used to denote a product that is sold in a liquor store. Equations (7) and (8) describe the market clearing conditions for wine; here subscript G is introduced to denote a product distributed in a grocery store. In the absence of wine in grocery stores I is equal to I_L and O is equal to O_L; once wine is introduced into grocery stores I_G and O_G comprise the difference between total wine sales and wine distributed through liquor stores.

(1) $I = f(P^I, P^O; a)$

(2) $I_L = f_L(P^I, P^O; a_L)$

(3) $O = h(P^I, P^O; b)$

(4) $O_L = h_L(P^I, P^O; b_L)$

(5) $I = f(P^I; c)$

(6) $O = h(P^O; d)$

(7) $I = I_L + I_G$

(8) $O = O_L + O_G$

An equilibrium displacement model was developed by totally differentiating the system of equations and converting them to elasticity form. The simulation model shown below is used to solve the proportional changes in quantities and prices as functions of various elasticity and share parameters. In equation (9) through (16), equilibrium adjustments can be simulated by exogenously specifying changes in supply and demand of wine products. In the following equations, for any variable A, $d\ln A$ represents the relative change in A, that is, $d\ln A$ represents dA/A where d refers to a total differential.

(9) $d\ln I = \eta_{II} d\ln P^I + \eta_{IO} d\ln P^O + \alpha$

(10) $d\ln I_L = \eta_{II,L} d\ln P^I + \eta_{IO,L} d\ln P^O + \alpha_L$

(11) $d\ln O = \eta_{OO} d\ln P^O + \eta_{OI} d\ln P^I + \beta$

(12) $d\ln O_L = \eta_{OO,L} d\ln P^O + \eta_{OI,L} d\ln P^I + \beta_L$

(13) $d\ln I = \varepsilon_I d\ln P^I + \gamma$

(14) $d\ln O = \varepsilon_O d\ln P^O + \delta$

(15) $d\ln I = \upsilon_L d\ln I_L + (1 - \upsilon_L) d\ln I_G$

(16) $d\ln O = \omega_L d\ln O_L + (1 - \omega_L) d\ln O_G$

Equations (9) through (12) describe the relationships between changes in wine prices and demand for wine. Equation (9) models changes in total demand for in-state wine and equation (10) models changes in demand for in-state wine sold in liquor stores. Equation (11) models changes in total demand for out-of-state wine and equation (12) models changes in demand for out-of-state wine sold in liquor stores. Equations (13) and (14) outline the relationships between changes in wine prices and the supply of in-state and out-of-state wine. Equation (15) specifies that changes in the total supply of in-state wine is equal to the weighted changes in demand for in-state wines at liquor stores and grocery stores; equation (16) outlines a similar specification for out-of-state wines.

3.1 Model Parameters

The simulation model requires parameters for various demand and supply elasticities of wine. In the demand equations the price elasticity of demand for wine *j* with respect to the price of wine *k* is represented by η_{jk}; subscript L is added to differentiate demand elasticities for wine that is sold in liquor stores. Supply elasticities for wine *i* are denoted as ε_i in equations (13) and (14). Demand and supply elasticities for wine are not estimated here but rather are based on estimates in the literature. Carew, Florkowski, and He (2004) and Trolldal (2005) estimated demand elasticities for a range of wines; Volpe, Green, and Heien (2008) estimated supply elasticities for various wine grapes. In our baseline model we use –0.4 for all own-price elasticities of demand for wine, and 0.1 to describe cross-price elasticities between in-state and out-of-state wine. The supply of out-of-state wine is expected to be very elastic (even in the short run) and is set equal to 10.0 in the baseline model while the supply of in-state wines will be less elastic in the short to medium run and is set equal to 1.2. We assume that the cross product

impacts on the supply side are negligible and set the cross price elasticities of supply equal to zero in the simulation experiments.

Parameters υ_L and ω_L in equations (15) and (16) describe liquor store sales shares, or more specifically, the share of in-state and out-of-state wine sold in liquor stores. In the absence of wine sold in grocery stores, both of these parameters would be set at 1.0; however, the simulation experiments will be conducted assuming that the share of wine sold in liquor stores is approximately equal to the number of liquor stores relative to the total number of outlets selling wine (denoted as ρ).[3] Furthermore, because the quantity of wine available in liquor stores is expected to exceed that in grocery stores, we use a grocery store equivalency factor (denoted as κ) to highlight the proportion of wine sold in liquor stores relative to wine sold in grocery stores. The grocery store equivalency factor is used to calculate ρ in equation (17); this calculation also requires information describing the number of liquor stores (denoted L) and the number of grocery stores (denoted G). We only consider liquor stores and grocery stores in the total number of outlets selling wine, and for simplicity, omit wine sold in restaurants and at wineries.

(17) $\rho = \kappa L/(\kappa L + G)$

A key set of parameters in the simulation model describes the size of demand shifts for the four products should wine be introduced into grocery stores. Parameter α denotes demand shifts for in-state wine and β denotes demand shifts for out-of-state wine; adding subscript L refers to demand shifts for wine sold at liquor stores. A series of calculations are used to describe the changes in demand for wine. Equation (18) shows that the total shift in demand for in-state wine depends on the overall expansion of wine sales (denoted as ψ) and the proportion of the expansion that will accrue to in-state wines is represented by λ. Both ψ and λ will be subject to our sensitivity analysis; however, baseline values will be assigned using the information in

Table 1 which summarizes the demand effects in other regions that have introduced wine into grocery stores. Equation (19) calculates the total demand shift for out-of-state wines and requires additional information about in-state wine consumption (denoted C), sales of in-state wine (denoted Q^I) and sales of out-of-state wine (denoted Q^O). Unless more information is known, total consumption is calculated simply as the U.S. per capita consumption level multiplied by the state's population; in 2007 the U.S. average per capita consumption of wine was 2.5 gallons (Wine Institute 2008) and the New York State population was approximately 19 million. For a small wine-producing region like New York State, we assume that all in-state wine production is sold locally; in the calculation of Q^I, each ton of wine grape production is measured as 62 cases of wine (equivalent to 558 liters or 147.4 gallons). Sales of out-of-state wine are the difference between C and Q^I.

(18) $\alpha = \psi\lambda$

(19) $\beta = (\psi C - \alpha Q^I)/Q^O$

In Equation (18) λ is an important parameter that is used to describe how much of the general increase in wine sales can be captured by the in-state sector. The value of λ can be positive or negative and is expected to depend on quality factors (such as Wine Spectator scores and other awards), presence of in-state wines in restaurants, number of in-state American Viticulture Areas, production share of in-state consumption, and export quantities. A value of 0.5 for λ is used in the baseline results and the sensitivity analysis examines the effects of using two other values. The effects for a negative market response for in-state wines (setting λ set equal to –0.2) are considered as is the case for which the in-state response nearly matches the overall shift in demand for wine (setting λ equal to 0.9).[4]

The total shifts in demand for in-state and out-of-state wine incorporate demand changes in both liquor stores and grocery stores. Equation (20) and (21) are employed to isolate the demand changes for wine sold in liquor stores. Here demand changes incorporate information about total demand shifts, initial quantities, and number of grocery store equivalent outlets selling wine.

(20) $\alpha_L = (1 + \alpha)\rho - 1$

(21) $\beta_L = (1 + \beta)\rho - 1$

Introducing wine into grocery stores may lead to implications for the production, distribution, and marketing of both in-state and out-of-state wines. For example, expanded sales of wine may introduce new or reduced costs associated with transportation and advertising. In addition, a general increase in demand for wine would be expected to be met with an increase in wine production.[5] To capture these effects the simulation model includes parameters that incorporate shifts in the supply of in-state wine (denoted γ) and out-of-state wine (denoted as δ). Because simulation results will hinge on the size of changes in the market for wine, we consider various plausible scenarios and report results that use a range of values for the demand and supply shifts introduced in these calculations. A summary of all parameters used in the simulation experiments is shown in Table 2.

4. Results

A series of experiments are performed to simulate the impact of introducing wine into grocery stores. Each experiment introduces exogenous demand, and in some cases supply, shocks that may be associated with greater wine distribution. Equilibrium adjustments in prices and quantities are used to calculate welfare changes for in-state wine producers, out-of-state wine producers, liquor stores, and taxpayers. Although we do not measure the implications for in-

state wine consumers and grocery stores, it is expected that greater distribution of wine will generate additional welfare for both groups. Change in revenues for in-state wine producers, out-of-state wine producers, and liquor stores are measured as percent changes; changes in taxpayer revenue are measured in dollars.

Table 3 outlines the elasticity specifications and the demand changes that are calculated following equations (18), (19), (20), and (21). Following the demand changes we list the changes in prices and quantities for in-state and out-of-state wine for the various scenarios. In addition, changes in prices and quantities are subsequently used to calculate revenue changes for in-state wineries (Ω^{I}) using equation (22) and revenue changes for out-of-state wineries (Ω^{O}) using equation (23). Revenue changes are set equal to the sum of the change in price and the change in quantity; this calculation is a simplification but it does provide a reasonable approximation of the changes in revenues for wine producers.

(22) $\Omega^{I} = d\ln P^{I} + d\ln I$

(23) $\Omega^{O} = d\ln P^{O} + d\ln O$

Liquor store owners have shown resistance to proposals that would allow wine to be sold in grocery stores as it is expected to reduce their wine sales (*e.g.*, Last Store on Main Street, 2009). A key objective of this research is to quantify the economic impact for liquor stores and provide a range of potential outcomes given various plausible scenarios. The revenue impact for liquor stores is driven by changes in prices and quantities of both in-state and out-of-state wines, and their shares of total sales. Equation (24) outlines the revenue implications for liquor store owners (denoted as Ω_L) where the parameter θ_L measures the share of wine sales relative to total sales in liquor stores and μ_L is the proportion of in-state wine sales relative to total wine sales in liquor stores.

(24) $\Omega_L = \theta_L[\mu_L(d\ln P^I + d\ln I_L) + (1 - \mu_L)(d\ln P^O + d\ln O_L)]$

Allowing wine to be sold in grocery stores (in addition to liquor stores that are currently selling wine) is expected to increase government revenue from excise, state, and county taxes. All three effects are summarized in equation (25); the parameter τ is the excise tax rate[6], φ_S is state tax rate, and φ_C is the county tax rate. The tax revenue calculated in equation (25) is for excise, state, and county taxes applied to changes in wine sales.

(25) $\Omega_T = \tau(d\ln IQ^I + d\ln OQ^O) + [P^I(1 + d\ln P^I)(d\ln IQ^I) + P^O(1 + d\ln P^O)(d\ln OQ^O)](\varphi_S + \varphi_C)$

Table 3 provides our baseline results for a range of potential demand shifts given greater distribution of wine. The results in Table 3 are grouped according to the overall shift in demand for wine; based on the range of findings in Table 1, we consider the effects from an overall demand shift equal to 10%, 25%, and 60%. Within each demand shift, we also simulate the effects for three types of responses from the in-state wine sector. It is not expected that demand for in-state wine will exceed the overall demand shift; the case when demand for in-state wine falls as a result of introducing wine into grocery stores is also considered. The ability of the in-state wine sector to capture part of the overall demand shift is denoted by λ in our model, and we examine the effects of setting λ equal to –0.2, 0.5, and 0.9.

The first three columns in Table 3 show results for scenarios with an overall demand shift equal to 10% (Minor impact), the middle three columns show results for an overall demand shift equal to 25% (Modest impact), and the final three columns show results for an overall demand shift equal to 60% (Major impact). Elasticity parameters are held constant and no supply response is considered in the results shown in Table 3. Results for the nine scenarios can be differentiated by size of the total demand shift for wine and the share of that shift that is captured by the in-state wine sector. Results from Scenario 1 (shown in the first column of results)

highlight the economic implications for a total demand shift of 10% and an in-state demand shift of –2%. In Scenario 1 demand for both types of wine falls at liquor stores, yet the total amount of out-of-state wine increases by 14%; prices of in-state and out-of-state wine adjust slightly but there are large adjustments in some quantities of wine and revenues for key stakeholders. Given the demand changes for the two wine types, revenues for in-state wines would fall while revenues for out-of-state wine would increase. Liquor store revenues would fall by 30.7% in Scenario 1 and the annual government revenue would increase by $8.8 million. Results from Scenarios 2 and 3 show that as the in-state sector captures more of the overall increase in wine demand the price, quantity, and revenue effects for in-state wines become positive and larger; at the same time there would be some offsetting effects in the market for out-of-state wine. Revenue for liquor store owners falls by at least 17.4% in each scenario. Results from simulations that assume a greater change in demand for wine (and a positive demand response for in-state wines) would lead to more favorable implications for all stakeholders.

Table 4 and 5 present results that test how sensitive the results would be to changes in key parameters. Table 4 shows results that include some supply response for both in-state and out-of-state producers. The results from scenarios 2, 5, and 8 in Table 3 (Minor, Modest, and Major changes in demand for wine with λ set equal to 0.5 in each case) are used as the starting points in the scenarios outlined in Table 4. Table 5 shows results for scenarios that include some supply response and alternative elasticity scenarios. The results shown in Scenario 12 plus the findings across a range of elasticity parameters (in Scenarios 18 and 19) provide a range of the most likely economic implications of introducing wine into grocery stores in a region with a small but important wine-producing sector.

Introducing wine into grocery stores has the capacity to generate an increase in overall welfare among stakeholders in wine markets. Our baseline results in Scenarios 12, 18, and 19 show that demand and revenues for in-state and out-of-state wine would increase as would government revenues. However, the simulations show that the quantity of wine sold in liquor stores would fall and total liquor store revenue would decrease by approximately 28%. A decrease in revenue of this magnitude has been anticipated by industry stakeholders and showcases the driving force behind the opposition to proposals allowing wider distribution of wine among liquor store owners. This finding highlights that any proposed changes to the way wine is sold will lead to welfare changes that are not distributed equally, and policy makers need to consider transitional issues within the industry. In the next section we introduce a framework that combines the simulated results with economic indicators to assess the market adjustment costs for liquor store owners should wine be introduced into grocery stores.

5. Quantifying the "resistance" to greater distribution of wine

Previous proposals concerning wider distribution of wine have considered a range of transitional issues and compensation schemes for liquor store owners. These include provisions that would allow liquor stores to distribute additional beverage products, sell food items, hold more than one license, and obtain an additional wine and liquor license that is transferable. More attention needs to be spent on examining the appropriate level of compensation for liquor store owners, and a central issue in this debate is the management of wine licenses. The number of wine and liquor licenses, and the price of these licenses, are controlled by the state government; the presence of a supply control in the market for wine and liquor licenses has the potential to create rents for liquor stores. Results from the simulations are used to shed some light on the magnitude of such rents accruing to liquor stores in New York State.

Wine and liquor licenses in New York State share many features of quotas that have been used in agricultural markets in the United States, the European Union (EU), Canada, Australia, and elsewhere. Quotas in agricultural markets provide selected producers the right to market their products; quotas have been applied to many products including U.S. tobacco and peanuts, EU sugar, and Canadian dairy and eggs. Recent efforts to reform agricultural policies in the United States and the European Union have led to elimination of various quota programs. Understanding the economic effects of eliminating quota programs has developed into an important area of research among agricultural economists. U.S. peanut quotas were converted into producer subsidies in 2002 (Dohlman, Hoffman, and Young 2003), the EU sugar quota was eliminated through a buy-out financed by EU taxpayers (Frandsen, Jensen, Yu, and Walter-Jørgensen 2003; Gohin, and Bureau 2006), and the U.S. tobacco quota was eliminated using a buy-out financed by cigarette producers and importers (Capehart 2003; Brown, Rucker, and Thurman 2007). Barichello, Cranfield, and Meilke (2009) provide a review of assistance schemes used when reform was introduced to various Canadian agricultural markets. Understanding the implications of quota buyouts and other experiences that transitioned agricultural producers from quota programs will facilitate a better understanding of the current market for wine and liquor licenses in New York State.

Figure 3 outlines the market for wine licenses in New York State.[7] In the absence of government regulation concerning the number of wine licenses, Q^e licenses would be available at price P^e. The current regime limits the number of wine licenses to Q^s and this creates a wedge between the price liquor stores pay for a license (P^s) and the full market value of owning a license (P^m). The difference between P^s and P^m, denoted as *r* in Figure 3, represents the annual rent that accrues to a wine license holder. The value of this rent is related, in some capacity, to

revenue loss for liquor store owners given the introduction of wine into grocery stores. For simplicity, we calculate the value of *r* for a liquor store to be the product of Ω_L and the net profit that the store receives from wine sales, denoted as π. Each liquor store owner purchases a license every three years, and therefore it is reasonable to assume that their decision to sell wine involves a multiple year commitment. The net present value calculation for an annuity can be used to consider the long run implications for an expected stream of benefits. Equation (26) shows the present value calculation for a stream of rents accruing to a liquor store owner, denoted as *R*, over n years based on discount rate i.

(26) $$R = (\Omega_L \pi / i)(1 - (1/(1 + i)^n))$$

Combining results from the simulation experiments with some plausible parameters that describe economic conditions in wine markets, equation (26) can be used to better understand the full value of wine licenses in New York State. Table 6 provides a range of results for the capitalized values of wine licenses in New York State using the calculation in equation (26); results are provided across net incomes (from wine sales) between $10,000 and $100,000, between 3 years and 15 years, for decreases in liquor store revenue of 20% and 30%, and using discount rates of 4% and 7%. For example, the capitalized value of a wine license for a liquor store with $50,000 in net profit from wine sales that expects a 20% decrease in wine sales over 9 years (using a discount rate of 7%) would be $65,200. Liquor stores across New York State differ in size and sales volume, and therefore the value that each liquor store places on their wine license is different; Table 6 describes a range of values that liquor stores may attribute to their wine license. The results in Table 6 also provide policy makers with information about the implicit costs (or revenue reductions) liquor store owners may face if wine was introduced into grocery stores.

Purchasing licenses from liquor stores at the fully capitalized value would be very expensive for the state government, and difficult politically. Previous proposals that examined the effects of introducing wine into grocery stores have explored the possibility of imposing a one-time entrance fee, or a franchise fee, on grocery stores (American Economics Group, 2002). In California, food and drug stores are charged an Original Fee (equivalent to a franchise fee) of $12,000 which gives them the ability to distribute wine (CDABC, 2009). A range of franchise fees between 0.2% and 0.5% of total grocery store sales have been considered in New York State, and total revenue from these fees is expected to exceed $100 million (American Economics Group, 2002; Rosen 2009). Revenue from franchise fees (or similar initiation fees) has been collected by governments in other states; however, these revenues might also be used to compensate liquor store owners that volunteer to exit the industry.

A carefully constructed transition scheme would be able to use franchise fee revenue to compensate a proportion of liquor stores interested in a license buyout program. Furthermore, the buyout program described here would not impose additional costs on taxpayers as it would be financed by grocery stores. For example, 50% of expected franchise fee revenues would provide sufficient funds to purchase license rights from 1,000 liquor store owners at a compensation rate of approximately $50,000. The remaining 50% of expected franchise fees would be used as taxpayer revenue. Diverting franchise fee revenues from the state government to liquor store owners would reduce potential taxpayer benefits in the short run, yet it would provide funds to operate a license buyout program. A buyout program would facilitate the introduction of wine into grocery stores in New York State and would enable the state government to collect approximately $22 million in additional (excise, state, and county) tax revenue annually on the increased volume of wine sold.

6. Industry and Policy Implications

There has been a long history of government regulation related to wine marketing in the United States, and many regulations have been state-specific. Prior to 1970, twenty-five states did not allow wine to be sold in grocery stores; between 1969 and 1985 eight of the twenty-five states introduced wine into grocery stores. Many attribute the significant increase in per capita consumption rates of wine in these eight states to the introduction of wine into grocery stores. Currently fifteen states do not allow wine to be sold in grocery stores while two other states have restrictions that effectively limit wine sales outside of liquor stores. Recently there has been a renewed interest among the remaining states to expand wine distribution beyond liquor stores and into grocery stores. Legislative proposals have been put forward in several states with support from wine consumers and grocery stores. In addition, these proposals are typically viewed as a vehicle for state governments to raise additional revenue through sales taxes, excise taxes, and license fees. There has been strong opposition towards these proposals from liquor stores, social interest groups, and in some cases, in-state wineries that are uncertain about the costs and benefits of such a policy change. The purpose of this article is to quantify the economic implications of introducing wine into grocery stores for various stakeholders, and develop a framework to assess some of the transitional issues that would accompany such a policy change. The results can be applied to other regions, but New York State serves as the focus here because of its population and local wine sector, and because these types of proposals were introduced in the State in 1984 and 2009.

Simulation results presented here provide a range of possible implications for various stakeholders. The results suggest that welfare increases are likely for in-state wine producers, but the results hinge on the initial market share of in-state wines and the ability of the sector to

respond to the policy change and compete with out-of-state wines. Overall, the results show a range of possible changes in prices and quantities for both in-state and out-of-state wines, yet three key results emerge from all of the scenarios that examine the effects of introducing wine into grocery stores, and these results are relatively robust across the scenarios. First, government revenue from additional tax would increase by $22 million per year in our baseline scenarios. Second, the market share of out-of-state wines would grow and revenues for this group would increase between 30% and 40% in the baseline scenarios. Third, the quantity of wine sold, and revenue earned, by liquor stores would fall by between 17% and 32%.

Introducing wine into grocery stores has the potential to increase overall welfare for stakeholders in the wine sector, yet liquor stores would absorb all of the costs that result from the policy change. Resistance from this group has prevented proposals in 1984 and 2009 to pass in New York State, and it is expected that future proposals need to carefully assess provisions for liquor store owners. One possible provision might consider allowing liquor stores to sell beer and food. A second would allow liquor stores to maintain more than one sales outlet; this provision could be expanded to a proposal that gives all existing liquor stores a second license that could be sold or used to open an additional store. A third provision might adopt a policy that facilitates purchases of licenses from existing liquor stores; in this case a framework would be needed to assess the capitalized value of current wine licenses. Following the third provision, the government may develop an optional buy-out program that is designed to attract a proportion of liquor stores. This approach would require the state government to collect franchise fees from grocery stores and use the funds to purchase licenses from liquor stores. Diverting franchise fees from the state government and using them to compensate liquor store owners will certainly reduce taxpayer revenues in the short run. However, expanded wine distribution and increased

wine sales will generate additional tax revenue; results indicate that annual government revenues from taxes on additional wine sales would not be trivial.

Economic benefits would clearly be generated for out-of-state wineries and government revenues; simulation results suggest that the introduction of wine into grocery stores would also yield net benefits to in-state wineries. Liquor stores are shown to lose significant welfare with this policy change; however, a framework is developed here that outlines a compensation scheme that would redistribute part of the overall welfare gain from taxpayers and/or grocery stores to liquor stores. The wine sector in New York State is relatively small compared to the major wine-producing regions in the world; however, the sector has experienced a significant amount of growth in acreage and value between 1990 and 2009, especially for *Vitis vinifera* varieties. The industry is approaching a stage in its development where it needs to review strategic marketing issues, including attracting a larger "domestic" consumer base. Introducing wine into grocery stores would increase the availability of wine to domestic consumers and may be a mechanism to foster the development of this burgeoning industry.

Table 1: Effects of introducing wine into grocery stores in selected regions

Region	Year	Number of outlets (before-after)	Source	Study period	Change in sales[a] (%)
Washington[b]	1969	300-4000	Wine Institute (1986)	1968-1970	48
			MacDonald (1986)	1969-1978	26
Maine	1971	65-1400	Wine Institute (1986)	1970-1972	185
			MacDonald (1986)	1971-1978	305
			Wagenaar and Holder (1995)	1971-1991	137
Idaho	1971	70-1000	Wine Institute (1986)	1970-1972	234
			MacDonald (1986)	1971-1978	190
			Wagenaar and Holder (1995)	1971-1991	150
Alabama[c]	1973	121-1100	Wine Institute (1986)	1972-1974	83
			Wagenaar and Holder (1995)	1973-1980	16
	1981	1100-2300	Wagenaar and Holder (1995)	1981-1991	42
New Hampshire	1978	70-1000	Wine Institute (1986)	1977-1979	31
			Wagenaar and Holder (1995)	1979-1991	15
Quebec[d]	1978	353-9000	Smart (1986)	1978-1983	0
			Adrian, Ferguson, and Her (1996)	1953-1990	0
			Trolldal (2005)	1950-2000	10
	1983		Adrian, Ferguson, and Her (1996)	1953-1990	0
			Trolldal (2005)	1950-2000	0
Montana	1979	140-800	Wine Institute (1986)	1978-1980	74
			Wagenaar and Holder (1995)	1979-1991	75
West Virginia	1981	165-1100	Wine Institute (1986)	1980-1982	52
			Wagenaar and Holder (1995)	1982-1987	48
Iowa	1985	215-800	Wine Institute (1986)	1984-1986	72
			Holder & Wagenaar (1990)	1968-1989	79
New Zealand[e]	1990	3100-3700	Wagenaar and Langley (1995)	1983-1993	17

[a] Percentages shown here represent the impact from allowing wine to be sold in grocery stores.
[b] Out-of-state wine was introduced to grocery stores that previously sold in-state wines.
[c] Wine sales in grocery stores were introduced to three counties in 1973; between 1973 and 1981 wine was introduced to grocery stores in the remaining counties.
[d] Domestically produced wine was introduced to grocery stores in 1978; in 1983 imported wine that was bottled in Quebec was also allowed to be sold in grocery stores.
[e] Prior to 1990 there were approximately 6250 licenses for selling wine, however, each outlet typically included multiple licenses and the outlet equivalent was about 3100 locations. In 1990 600 additional licenses were issued.

Table 2: A summary of parameters used in the simulation models

Parameter description	Parameter notation	Parameter values
Grocery store equivalency factor	κ	4.0
Number of liquor stores	L	2,400
Number of grocery stores	G	19,000
Ratio of liquor stores to grocery stores	ρ	0.35
Share of in-state wine sold in liquor stores	υ_L	0.30
Share of out-of-state wine sold in liquor stores	ω_L	0.30
Wine's share of sales in liquor stores	θ_L	0.50
State tax rate (%)	φ_S	0.04
County tax rate (%)	φ_C	0.04
Excise tax rate ($ per gallon)	τ	0.30
Total in-state wine consumption (gallons)	C	51,300,000
Sales of in-state wine (gallons)	Q^I	11,900,000
Sales of out-of-state wine (gallons)	Q^O	39,400,000
Total shift in demand for wine should sales be expanded into grocery stores	ψ	0.10, 0.25, 0.60
Total shift in demand for in-state wine should sales be expanded into grocery stores	λ	–0.2, 0.5, 0.9
In-state supply response	γ	0, 0.10, 0.10
Out-of-state supply response	δ	0, 0.10, 0.20
Own price elasticity of demand for in-state wine	η_{II}	0.8, 1.2, 3.0
Own price elasticity of demand for out-of-state wine	η_{OO}	6.0, 10.0, 30.0
Cross price elasticity of demand for all wines	η_{OI} , η_{IO}	0.1
Price elasticity of supply for all wines	ε_I and ε_O	1.0

Table 3: Simulated effects of introducing wine into New York State grocery stores

Scenario	1	2	3	4	5	6	7	8	9
	Minor impact			*Modest impact*			*Major impact*		
Own Elasticities									
In-state demand	–0.4	–0.4	–0.4	–0.4	–0.4	–0.4	–0.4	–0.4	–0.4
Out-of-state demand	–0.4	–0.4	–0.4	–0.4	–0.4	–0.4	–0.4	–0.4	–0.4
In-state supply	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Out-of-state supply	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Change in:									
Demand (%)									
Total	10.0	10.0	10.0	25.0	25.0	25.0	60.0	60.0	60.0
In-state	–2.0	5.0	9.0	–5.0	12.5	22.5	–12.0	30.0	54.0
In-state, liquor stores	–66.2	–63.8	–62.4	–67.2	–61.2	–57.8	–69.7	–55.2	–46.9
Out-of-state	14.0	11.7	10.3	35.1	29.2	25.8	84.2	70.1	62.0
Out-of-state, liquor stores	–60.7	–61.5	–62.0	–53.4	–55.4	–56.6	–36.5	–41.1	–44.1
In-state price (%)	–1.2	3.2	5.7	–2.9	8.0	14.2	–7.0	19.2	34.1
In-state quantity (%)	–1.4	3.8	6.8	–3.5	9.6	17.1	–8.4	23.0	41.0
In-state quantity, liquor stores (%)	–65.6	–65.0	–64.6	–65.7	–64.1	–63.2	–66.1	–62.2	–59.9
Out-of-state price (%)	1.3	1.2	1.0	3.3	2.9	2.6	8.0	6.9	6.3
Out-of-state quantity (%)	13.4	11.5	10.5	33.4	28.8	26.2	80.3	69.2	62.9
Out-of-state quantity, liquor stores (%)	–61.3	–61.6	–61.8	–55.1	–55.8	–56.2	–40.4	–42.2	–43.2
In-state winery revenue (%)	–2.6	7.0	12.5	–6.4	17.6	31.3	–15.4	42.2	75.1
Out-of-state winery revenue [a] (%)	14.7	12.7	11.5	36.8	31.7	28.8	88.3	76.1	69.2
Liquor store revenue [b] (%)	–30.7	–30.4	–30.2	–27.6	–26.8	–26.3	–20.3	–18.4	–17.4
Government tax revenue [c] (million $)	8.8	8.8	8.8	22.5	22.3	22.4	56.1	55.6	56.7

[a] Percent change reflects impact on revenue for out-of-state wine sold in the region (not global sales).
[b] Changes in liquor store revenue consider the weighted effects of in-state and out-of-state wine sales relative to total liquor store sales.
[c] Changes in government tax revenue include state, county, and excise taxes on additional wine sales.

Table 4: Implications considering some supply response

Scenario	10	11	12	13	14	15
	Minor impact		*Modest impact*		*Major impact*	
Elasticities						
In-state demand	–0.4	–0.4	–0.4	–0.4	–0.4	–0.4
Out-of-state demand	–0.4	–0.4	–0.4	–0.4	–0.4	–0.4
In-state supply	1.2	1.2	1.2	1.2	1.2	1.2
Out-of-state supply	10.0	10.0	10.0	10.0	10.0	10.0
Change in:	*Minor impact*		*Modest impact*		*Major impact*	
Supply (%)						
In-state	10	20	10	20	10	20
Out-of-state	20	20	20	20	20	20
Demand (%)						
Total	10.0	10.0	25.0	25.0	60.0	60.0
In-state	5.0	5.0	12.5	12.5	30.0	30.0
In-state, liquor stores	–63.8	–63.8	–61.2	–61.2	–55.2	–55.2
Out-of-state	11.7	11.7	29.2	29.2	70.1	70.1
Out-of-state, liquor stores	–61.5	–61.5	–55.4	–55.4	–41.4	–41.4
In-state price (%)	–3.2	–9.4	1.6	–4.6	12.8	6.6
In-state quantity (%)	6.2	8.7	11.9	14.4	25.4	27.9
In-state quantity, liquor stores (%)	–62.6	–60.1	–61.8	–59.3	–59.8	–57.3
Out-of-state price (%)	–0.8	–0.9	0.9	0.8	4.9	4.9
Out-of-state quantity (%)	11.7	11.1	29.0	28.4	69.4	68.8
Out-of-state quantity, liquor stores (%)	–61.5	–62.1	–55.6	–56.2	–42.0	–42.6
In-state winery revenue (%)	3.0	–0.8	13.6	9.8	38.2	34.4
Out-of-state winery revenue [a] (%)	10.9	10.2	29.9	29.2	74.3	73.7
Liquor store revenue [b] (%)	–31.5	–32.1	–27.9	–28.6	–19.5	–20.2
Government tax revenue [c] (million $)	9.2	9.3	22.5	22.5	55.2	55.1

[a] Percent change reflects impact on revenue for wine sold in the region (not global sales).
[b] Changes in liquor store revenue consider the weighted effects of in-state and out-of-state wine sales relative to total liquor store sales.
[c] Changes in government tax revenue include state, county, and excise taxes on additional wine sales.

Table 5: Sensitivity of baseline results to elasticity specifications

Scenario	16	17	18	19	20	21
	Minor impact		*Modest impact*		*Major impact*	
Elasticities						
In-state demand	–0.2	–1.0	–0.2	–1.0	–0.2	–1.0
Out-of-state demand	–0.2	–1.0	–0.2	–1.0	–0.2	–1.0
In-state supply	0.8	3.0	0.8	3.0	0.8	3.0
Out-of-state supply	6.0	30.0	6.0	30.0	6.0	30.0
Change in:						
Supply (%)						
In-state	10	10	10	10	10	10
Out-of-state	20	20	20	20	20	20
Demand (%)						
Total	10.0	10.0	25.0	25.0	60.0	60.0
In-state	5.0	5.0	12.5	12.5	30.0	30.0
In-state, liquor stores	–63.8	–63.8	–61.2	–61.2	–55.2	–55.2
Out-of-state	11.7	11.7	29.2	29.2	70.1	70.1
Out-of-state, liquor stores	–61.5	–61.5	–55.4	–55.4	–41.4	–41.4
In-state price (%)	–5.1	–1.3	2.7	0.6	20.8	5.0
In-state quantity (%)	5.9	6.2	12.1	11.9	26.7	25.1
In-state quantity, liquor stores (%)	–62.9	–62.6	–61.6	–61.8	–58.5	–60.1
Out-of-state price (%)	–1.4	–0.3	1.5	0.3	8.4	1.6
Out-of-state quantity (%)	11.4	11.8	29.2	29.0	70.5	68.9
Out-of-state quantity, liquor stores (%)	–61.7	–61.3	–55.5	–55.7	–41.0	–42.5
In-state winery revenue (%)	0.7	5.0	14.8	12.5	47.5	30.2
Out-of-state winery revenue [a] (%)	10.0	11.6	30.7	29.3	78.9	70.6
Liquor store revenue [b] (%)	–32.1	–31.0	–27.5	–28.3	–16.8	–21.8
Government tax revenue [c] (million $)	8.9	9.4	22.8	22.3	58.1	53.2

[a] Percent change reflects impact on revenue for wine sold in the region (not global sales).
[b] Changes in liquor store revenue consider the weighted effects of in-state and out-of-state wine sales relative to total liquor store sales.
[c] Changes in government tax revenue include state, county, and excise taxes on additional wine sales.

Table 6: Capitalized value of current wine licenses for liquor store owners

Parameters **Years**	**Annual net income from wine sales**				
	10000	**25000**	**50000**	**75000**	**100000**
Ω_L = –0.2; i = 0.07	**(capitalized values in thousand dollars)**				
3	5.2	13.1	26.2	39.4	52.5
6	9.5	23.8	47.7	71.5	95.3
9	13.0	32.6	65.2	97.7	130.3
12	15.9	39.7	79.4	119.1	158.9
15	18.2	45.5	91.1	136.6	182.2
Ω_L = –0.3; i = 0.07					
3	7.9	19.7	39.4	59.0	78.7
6	14.3	35.7	71.5	107.2	143.0
9	19.5	48.9	97.7	146.6	195.5
12	23.8	59.6	119.1	178.7	238.3
15	27.3	68.3	136.6	204.9	273.2
Ω_L = –0.2; i = 0.04					
3	5.6	13.9	27.8	41.6	55.5
6	10.5	26.2	52.4	78.6	104.8
9	14.9	37.2	74.4	111.5	148.7
12	18.8	46.9	93.9	140.8	187.7
15	22.2	55.6	111.2	166.8	222.4
Ω_L = –0.3; i = 0.04					
3	8.3	20.8	41.6	62.4	83.3
6	15.7	39.3	78.6	117.9	157.3
9	22.3	55.8	111.5	167.3	223.1
12	28.2	70.4	140.8	211.2	281.6
15	33.4	83.4	166.8	250.2	333.6

Figure 1. An illustration of market effects for out-of-state wine

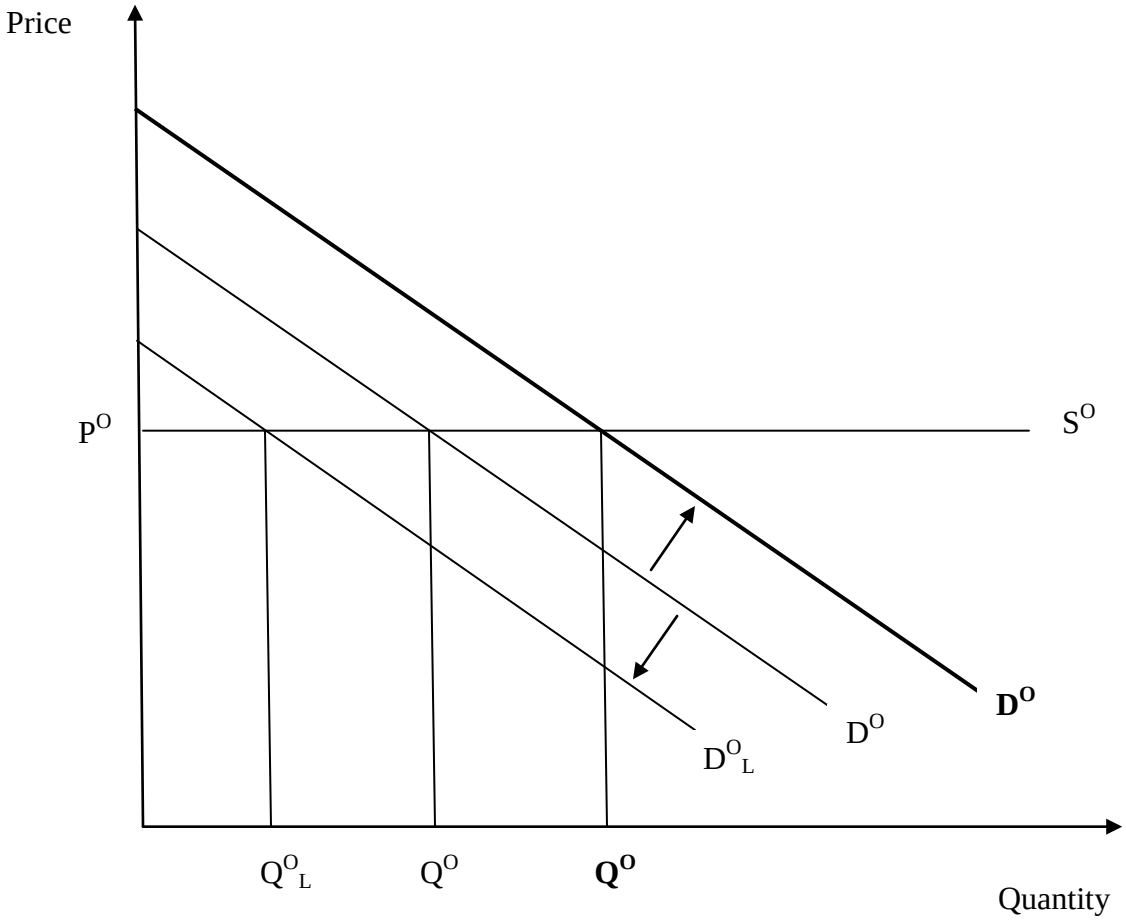


Figure 2. Two scenarios to describe the potential market effects for in-state wine

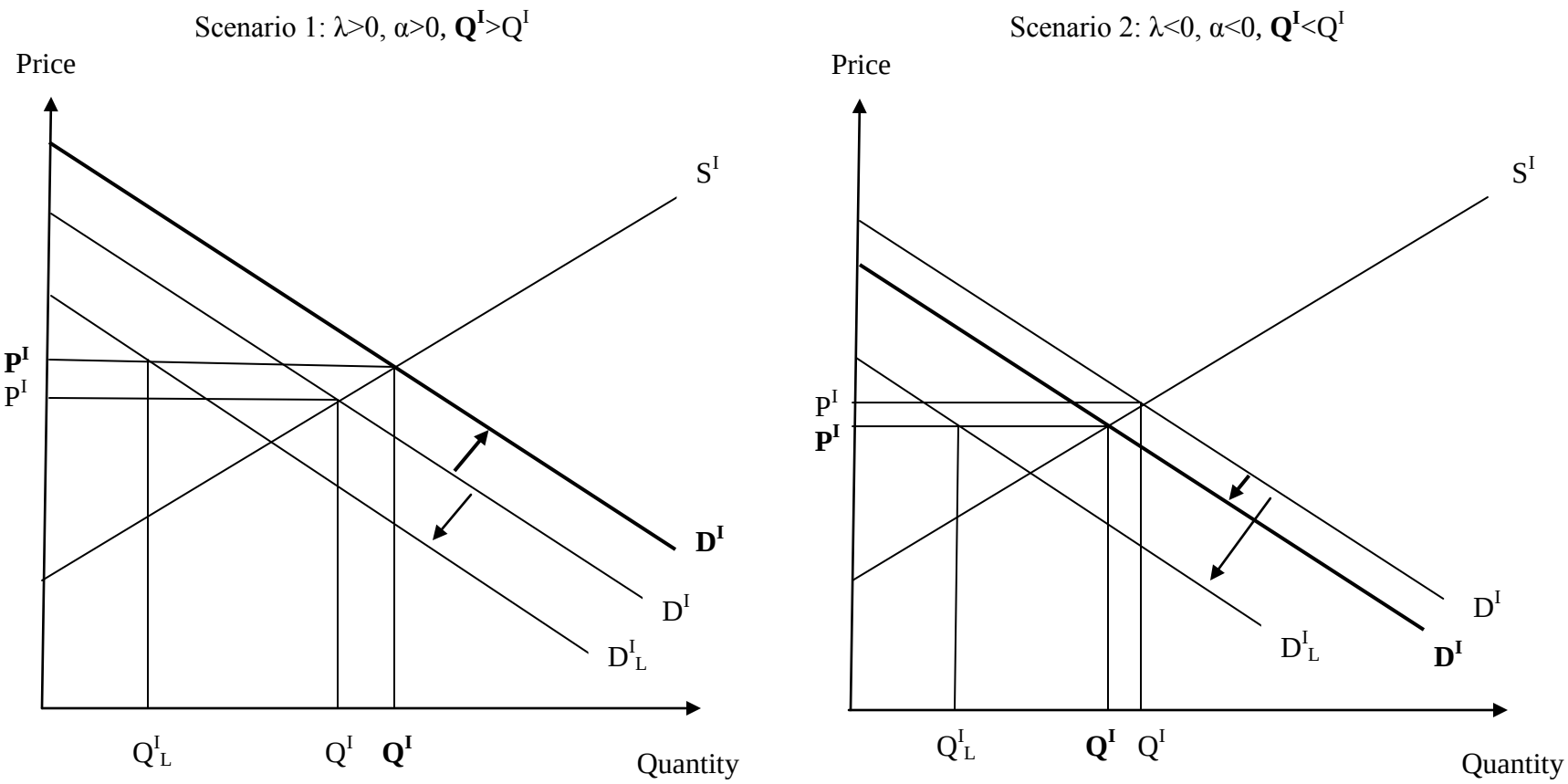
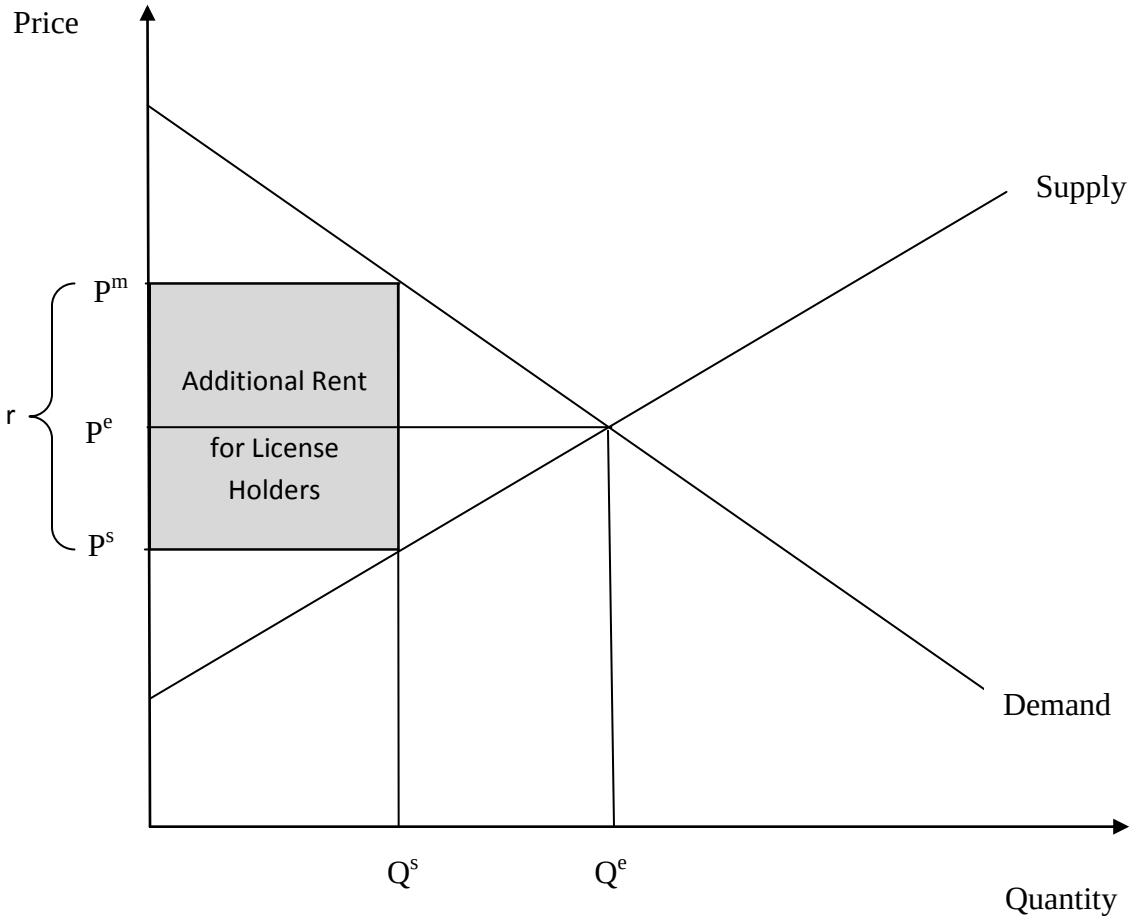


Figure 3. The market for retail wine licenses in New York State



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Endnotes

[1] The fifteen states with laws that ban or restrict wine sales in grocery stores include Alaska, Colorado, Connecticut, Delaware, Kansas, Kentucky, Maine, Minnesota, Mississippi, New York, Oklahoma, Pennsylvania, Rhode Island, Tennessee, and Utah. Arkansas, Massachusetts, and New Jersey also have rules that place some restrictions on wine sales in grocery stores (Wine Institute 2009).

[2] Governor Mario Cuomo's Executive Budget in 1984 proposed to allow wine to be sold in grocery stores; however, amendments were made such that only wine coolers were introduced into grocery stores. The proposal put forward by Governor David Paterson in 2009 was removed from the final version of the Budget.

[3] It could be argued that υ_L and ω_L should be set less than ρ because some in-state wine will be sold directly to consumers at wineries and because grocery stores might sell a higher proportion of out-of-state wine. For these reasons, the values for υ_L and ω_L are set slightly less than ρ in the baseline simulations.

[4] There is little evidence in Table 1 suggesting that the in-state response would be negative; however, including these scenarios provides a more complete understanding of the welfare implications for all stakeholders.

[5] An increase in the demand for out-of-state wine is not expected to impact production of out-of-state wine in a significant way; however, it could be important driver of growth in the production of in-state wine.

[6] The excise tax rate is now \$0.30 per gallon in New York State up from \$0.189 per gallon prior to April 2009.

[7] A liquor store owner must purchase a license for both wine and liquor; however, the analysis focuses on the capitalized value of rents for the “wine” component of these licenses.