



The Effect of Ticket Resale Laws on Consumption and Production in Performing Arts Markets

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Although most economists assume that ticket scalping is efficient, existing theoretical models make ambiguous predictions of the effect of ticket resale on production and attendance. This study uses variation in state and municipal laws to examine whether prohibiting or restricting resale has a positive or negative impact on consumer attendance and producer entry into arts markets. Our results show that restrictions on resale prices and license requirements stimulate attendance in performing arts events, but decrease the number of unique productions. This suggests that consumers value regulation that restricts prices and requires licensing for resellers over greater variety in productions.

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INTRODUCTION

The regulation of ticket scalping generates controversy and often evokes strong reactions from both sides of the debate. Ticket scalping refers to any resale of an event ticket for an amount above the face value (i.e., printed dollar value on the ticket). Ticket scalpers may be licensed brokers or unlicensed individuals reselling tickets on the street, online, or through any other means. Proponents of an unregulated secondary market argue that if a ticket scalper is willing to part with a ticket for \$100 and someone else is willing to pay that amount, then both individuals are better off if they are allowed to trade. Opponents, on the other hand, argue that scalpers charge extortionary prices and unfairly prevent fans from buying tickets to see their favorite performers. Two members of Congress (Sen. Charles Schumer (D-NY) and Rep. Bill Pascrell, Jr. (D-NJ)) have announced recently that they are independently drafting legislation that would increase transparency in the primary and secondary markets and place restrictions on the ability of scalpers to purchase and resell tickets.¹ The theoretical economics literature that examines the impact of scalping regulation makes ambiguous predictions regarding the implications of such laws, and therefore the effect of these regulations becomes an empirical question.

No federal law currently regulates ticket scalping, and thus states (and sometimes municipalities) are left to devise their own strategies and policies for regulating ticket resale. We exploit differences in state and municipal laws to empirically estimate the impact of ticket scalping on consumption and production in performing arts markets. We utilize data on consumer attendance at performing arts events from the 2002 Survey of Public Participation in the Arts (SPPA). To examine producers' entry decisions, we create a data set of productions by theaters that

belong to the Theatre Communications Group (TCG), which is an umbrella organization that includes more than 400 not-for-profit theater members in over 40 states.

Given the limited empirical work on ticket resale, our paper contributes by assembling a unique data set of consumption and production decisions. While previous works have focused on the impact of ticket resale on the National Football League (NFL), we examine the effect in performing arts markets; in contrast to sports markets, producers in the performing arts have flexibility and discretion over entry decisions as well as innovation and product variety. Our data also have the advantage of including information on both state- and municipal-level anti-scalping laws. Prior empirical work primarily focuses on the effect of state-level laws and therefore do not fully capture separate regulations enacted by municipalities, which often differ from state laws.

Substantial variation in ticket-scalping legislation exists across states. For instance, in 2006, Florida overturned a 60-year-old ticket scalping law that prohibited the resale of tickets for more than \$1 above face value (i.e., printed dollar value on the ticket); now, consumers and ticket brokers can purchase and sell tickets at any agreed upon price. In August 2007, a Minnesota law went into effect that lifted the 50-year state ban on selling tickets above face value.² States such as Arizona and California prohibit the resale of tickets at the site of the event. In New Jersey, ticket resellers must purchase licenses from a state regulator and cannot sell tickets for more than 50 percent above their face value. In Illinois, resellers must be licensed, but markups (i.e., the difference between the price the ticket sells for and the face value) are unrestricted. For some states, such as Colorado and Indiana, no regulation exists.

Ticket scalping is a prevalent practice in entertainment industries. Some estimates suggest that 10 percent of tickets sold in the primary market are later re-sold by ticket scalpers. In addition, scalped tickets account for 20–30 percent of top-tiered seats [Happel and Jennings 2002]. Ticket brokers or scalpers offer a multitude of tickets for events, including theater, concerts, and sporting events [Courty 2003a]. Consequently, a consumer can obtain a ticket for the Broadway musical “Wicked” directly at the box office (at the Gershwin Theater), through a ticketing agency that partners with the musical (e.g., Telecharge, Ticketmaster), or through a ticket scalper (e.g., Ticketsnow.com, eBay).

The impact of ticket scalping on consumers and producers is indeterminate. On the one hand, ticket scalping can improve efficiency. The transaction represents a trade from one party to another, and voluntary trading among two parties should lead to an outcome where both are better off.³ The opportunity for a secondary market to develop occurs because event producers tend to charge prices below market-clearing levels [Courty 2003a]. Ticket resale can therefore benefit both producers and consumers by reallocating tickets to the consumers who value them the most. The presence of ticket scalpers can also serve as “insurance” to producers who might otherwise not sell the tickets that scalpers purchase. The secondary market can also benefit consumers by allowing them to resell their tickets (e.g., if unforeseen circumstances prevent their attendance at the show) or to purchase tickets from resellers at the last minute.

On the other hand, ticket scalping could have detrimental effects on producers and consumers in the long run. Because scalpers may be able to price discriminate more perfectly than producers, they may extract profits that the producer would collect in the scalper’s absence.⁴ If scalpers lower producers’ profits, producers may



exit the market sooner or be discouraged from entering. Potentially, the quality or number of shows may decline, since producers accumulate fewer profits to invest back into productions.

Our results indicate that prohibiting resale above face value and requiring licenses for resellers stimulates attendance. We also find that while attendance increases, fewer distinct productions are shown in metropolitan areas or states that require ticket resellers to be licensed or that prohibit resale above face value. On the one hand, if laws that prohibit resale above face value do curtail prices, then we would expect attendance to increase when prices fall. On the other hand, if these laws also lead to less variety in the market (fewer productions), we would expect attendance to decrease. The overall effect on attendance will depend upon which effect dominates. Since attendance increases overall, this is consistent with consumers valuing regulation that restricts prices over greater product variety.

RELATED LITERATURE

Previous theoretical research implies that the impact of ticket scalping on attendance and producers' profits is ambiguous. Swofford [1999] describes a one-period model in which scalpers act as middlemen and exploit selling opportunities that the producer cannot due to differences in risk preferences, costs, or demand. In Swofford's model, scalpers sell tickets that would otherwise go unsold, and in this way may actually increase profits for the producer. The presence of ticket scalpers can also act as a form of insurance to producers, since ticket scalpers purchase tickets early and promote the event. If the event does not sell out, it is the scalper rather than the producer who is left with excess tickets and lower profits [Courty 2003a]. Moreover, the existence of a secondary market may induce more consumers to purchase tickets; consumers know that if they cannot attend the event due to unforeseen circumstances, they will be able to re-sell the ticket and recoup some of their losses.

Theoretical papers by Courty [2003a, b] and Karp and Perloff [2005] consider two-period models and reach differing conclusions regarding the impact of scalpers on a monopolist producer's profits. The differing results are largely based on assumptions regarding when consumers know their willingness to pay [Karp and Perloff 2005]. Courty's model draws on an analogy to airline ticket pricing. In this model, two different types of consumers exist. Low types value the ticket in the first period and do not value the ticket in the second period; these "die-hard fans" prefer to purchase the ticket early and have no value for the ticket in the last period (e.g., are unable to make last-minute arrangements). High type consumers do not know their willingness to pay for the event until the last period; these "busy professionals" value the ticket a lot if they are able to attend the show, but do not know their ability to attend until the last period. In Courty's model, the presence of ticket scalpers can decrease the profits of producers because of scalpers' ability to price discriminate more perfectly than the box office. In contrast, Karp and Perloff [2005] assume that all consumers have the same amount of information regarding their willingness to pay, and the value of the ticket does not depend upon when it is purchased. In their model, scalpers do not harm the producer and may in fact benefit the producer.

Since theory leads to ambiguous predictions, the effect of ticket scalping on attendance and producers' profits becomes an empirical question. Limited empirical

research exists on the effects of ticket scalping. Prior studies examine the impact of scalping laws on tickets for the NFL and Major League Baseball. Williams [1994] finds that ticket prices in the primary market are lower under the presence of anti-ticket scalping laws. His explanation suggests that an active, legal scalping market provides the NFL team with better information about consumers' true willingness to pay for the tickets. Elfenbein [2005] investigates the relationship between state-level anti-ticket scalping laws and online ticket scalping by examining transactions completed on eBay. He finds that stricter regulations were associated with fewer online transactions, higher prices, and higher markups, and he concludes that regulations against ticket scalping create significant opportunities for rent-seeking behavior. Depken [2006] finds that anti-scalping laws are correlated with higher prices and increase team revenues with no adverse effects on attendance. Our study differs in that we examine performing arts markets and consider changes in both attendance and production of these events.

Although the empirical evidence thus far focuses on sporting events, ticket scalping is pervasive in the performing arts as well. For many Broadway (and other) shows, ticket scalpers and brokers sell a substantial portion of the tickets [Leonhardt 2003]. Leslie and Sorensen [2009] examine the welfare effects of ticket resale, using an equilibrium model of primary and secondary market outcomes for major rock concerts and find evidence of welfare gains from resale. In contrast to sports markets, where entry decisions (e.g., number of games to play, length of season) are pre-determined or beyond the producers' control, producers for the performing arts have the discretion to choose whether to enter a market, and for each market, they may choose the number of performances and the quality of the show. Furthermore, ticket scalping may affect innovation and product variety in the performing arts in the long run.

DATA

Data on attendance were obtained from the 2002 wave of the SPPA. This survey is sponsored by the National Endowment for the Arts, and the most recent wave was conducted by the Census Bureau as a supplement to the August 2002 Current Population Survey (CPS). The data set is therefore a nationally representative sample containing detailed demographic information, as well as a large number of variables documenting respondents' arts consumption during the period from August 2001 through August 2002. Surveyed individuals report on the frequency of attendance at live performance events including plays and musicals.⁵ Summary statistics are reported in Table 1. As shown in the table, residents of cities or states that regulate scalping have slightly higher attendance at live performances, on average (1.07 performances annually versus 0.77 in non-law areas). Nineteen percent of law state (or city) residents have attended at least one musical in the previous year, 14 percent have attended at least one play, and 25 percent have attended at least one theater performance (play or musical). In states and cities with no regulation of ticket scalping, 16 percent of residents have attended a musical in the past year, 11 percent have attended at least one play, and 20 percent have attended at least one theater performance.

Our second data source contains a list of productions from all member theaters of the TCG from 2002 to 2006. The TCG is an umbrella organization that includes more than 400 not-for-profit theaters in over 40 states. This collection of theaters is

Table 1 SPPA summary statistics

	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
<i>Law state/region residents (N=8,853)</i>				
# musicals attended	0.43	1.39	0	48
# plays attended	0.34	1.50	0	50
# theater performances attended	0.77	2.44	0	96
Total live performances attended	1.07	3.23	0	96
Attend at least one musical	0.19	0.39	0	1
Attend at least one play	0.14	0.35	0	1
Attend at least one theater performance	0.25	0.43	0	1
Attend any live performance	0.28	0.45	0	1
Urban	0.88	0.32	0	1
Male	0.44	0.50	0	1
White	0.74	0.44	0	1
Married	0.55	0.50	0	1
Employed	0.64	0.48	0	1
<i>Non-law state/region residents (N=6,516)</i>				
# musicals attended	0.32	1.16	0	35
# plays attended	0.23	0.99	0	30
# theater performances attended	0.55	1.74	0	35
Total live performances attended	0.77	2.28	0	43
Attend at least one musical	0.16	0.36	0	1
Attend at least one play	0.11	0.31	0	1
Attend at least one theater performance	0.20	0.40	0	1
Attend any live performance	0.24	0.43	0	1
Urban	0.56	0.50	0	1
Male	0.46	0.50	0	1
White	0.83	0.38	0	1
Married	0.59	0.49	0	1
Employed	0.66	0.47	0	1

well-suited for the study, since they represent a “wide array of institutional sizes and structures.”⁶ According to their statistics, 36 percent of members have budgets under \$500,000; 21 percent in the \$500,000–\$1 million range; 25 percent in the \$1 million–\$3 million range; 6 percent in the \$3 million–\$5 million range; 8 percent in the \$5 million–\$10 million range; and 4 percent have budgets in the \$10 million or more range. Another advantage of this data set is that it contains productions across the majority of states, and therefore variation in state laws can be used. The TCG data set includes all of the not-for-profit Broadway theaters (the Vivian Beaumont, the Biltmore, Studio 54, and the American Airlines Theatre⁷), and non-profit Off-Broadway theaters as well as various-sized regional theaters. It is broadly representative of US theaters in general, most of which are non-profit organizations (with the exception of the majority of the Broadway theaters).

We create a balanced panel of the total number of unique productions during the period 2002–2006 by locating the reported production history from each theater’s website and by extracting the reported productions from the TCG database.⁸ Summary statistics are reported in Table 2. We counted the total number of productions for each theater in a given season; for theaters with missing production data in certain seasons, we used a linear interpolation.⁹ We also identified the city and state of location for each theater. Our data set contains a balanced panel of 45 states, including the District of Columbia and excluding Kansas, Nevada, North Dakota, Oklahoma, South Dakota, and Wyoming.¹⁰

Table 2 Summary statistics for TCG

	<i>Number of observations</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
<i>MSA level</i>					
Number of productions per capita (000's)	532	18.72	17.00	0.62	182.23
Not at site	532	0.18	0.39	0.00	1.00
License	532	0.24	0.43	0.00	1.00
Not above face value	532	0.34	0.47	0.00	1.00
Midwest	532	0.17	0.38	0.00	1.00
South	532	0.33	0.47	0.00	1.00
West	532	0.24	0.43	0.00	1.00
White	532	0.67	0.18	0.11	1.00
Black	532	0.13	0.12	0.00	0.56
Hispanic	532	0.14	0.14	0.00	0.69
Male	532	0.48	0.02	0.39	0.56
Married	532	0.40	0.04	0.27	0.53
<i>State level</i>					
Number of productions per capita (000's)	225	11.84	14.86	0.52	111.19
Not at site	225	0.04	0.21	0.00	1.00
License	225	0.16	0.36	0.00	1.00
Not above face value	225	0.22	0.42	0.00	1.00
Midwest	225	0.20	0.40	0.00	1.00
South	225	0.36	0.48	0.00	1.00
West	225	0.24	0.43	0.00	1.00
White	225	0.69	0.18	0.15	0.97
Black	225	0.13	0.13	0.00	0.68
Hispanic	225	0.11	0.12	0.01	0.51
Male	225	0.48	0.01	0.45	0.51
Married	225	0.40	0.03	0.23	0.46

Table 3 State laws^a on ticket resale

<i>Ticket resale regulation</i>	<i>States</i>
No resale at event site	Arizona, California
License required to sell	Alabama, Georgia, Illinois, Massachusetts, New Jersey, New York, Pennsylvania
No resale above face value	Arkansas, Connecticut, Florida, Kentucky, Louisiana, Michigan, Minnesota, North Carolina, Rhode Island, Wisconsin

^aMunicipal laws available from the authors upon request.

We include both state and municipal regulations on ticket resale in our analysis. While previous work primarily focuses on state-level laws (see Table 3), many municipalities enact separate restrictions on resale, which differ from state laws. For each city in our sample, we determined whether any municipal or state-level laws existed on ticket resale.¹¹ We used online databases of municipal codes (e.g., amlegal.com and municode.com) as well as city websites to identify whether any municipal ticket resale laws exist. In addition, we obtained a summary of state regulations on ticket resale from the National Conference of State Legislatures and from individual state legislatures. Similar to Elfenbein [2005], we classify each

metro area according to four types of regulation: no regulation, resale restricted at event site, re-sellers must be licensed, and tickets may not be resold above face value.

We create two distinct production data sets by aggregating the production data to the metropolitan- and state-level. For the metropolitan-level data set, we omit theaters from cities that do not lie within a metropolitan area as defined in the CPS 2002–2006 by a metropolitan statistical area (MSA) or core-based statistical area (CBSA).¹² For each region, we compute the total number of productions per capita and the average demographics. The metropolitan-level data set contains municipal as well as state-level laws, and the state-level data set contains the corresponding state laws on ticket resale.¹³

As seen in Table 2, we have data on over 500 metropolitan areas. The average number of productions is 19 per thousand residents. Substantial variation exists in laws across MSAs. Approximately 18 percent of the areas had regulations prohibiting resale at the site of the event; 24 percent of MSAs required re-sellers to be licensed, and approximately 34 percent of MSAs prohibited resale above face value. The MSAs exhibit geographic variation with 17 percent in the midwest, 33 percent in the south, 24 percent in the west, and 26 percent in the east. At the state level, we find a lower per capita number of productions as expected, since the total number of productions is divided by the entire state population and not the local metropolitan population.

RESULTS

Attendance

In order to assess the impact of anti-scalping legislation on production and consumption in live theater markets, we estimate the following regression, utilizing the 2002 SPPA:

$$\begin{aligned} performances_i = & \alpha_0 + \alpha_1 not\ at\ site_m + \alpha_2 not\ above\ face_m \\ & + \alpha_3 license_m + \mathbf{X}_i\beta + \hat{\delta}_m + \varepsilon_{im}, \end{aligned}$$

where i denotes the individual survey respondent and m denotes the municipality (or state) of residence.¹⁴ *Performances* refers to the number of plays, musicals, and other live performances that an individual reports attending during the previous year.¹⁵ *Not at site*, *not above face*, and *license* are indicator variables equal to 1 if the state or municipality of residence forbids resale of tickets at the event site, resale above face value, or resale without a license, respectively. \mathbf{X} is a vector of individual characteristics including income, race, employment status, marital status, age, gender, and education dummies, $\hat{\delta}$ is a set of Census region dummies, and ε is a random error term. Our regression controls for a host of demographic factors as well as regional dummies to capture any observed variation in consumption and production that might be correlated with ticket resale regulation. We estimate this equation using a zero-inflated negative binomial regression model, because the dependent variables (play attendance, musical attendance, play and musical attendance, and attendance at any live performance) are count variables equal to zero for a substantial fraction of the observations.¹⁶

Results from estimating this equation are reported in Table 4. As shown in the table, the various types of anti-scalping regulation have a positive impact

Table 4 Attendance at live performance events

	(1) # <i>Musicals</i>	(2) # <i>Plays</i>	(3) # <i>Theater performances</i>	(4) Total # <i>live performances</i>
Not above face	0.159* (0.071)	0.200** (0.075)	0.177** (0.062)	0.128* (0.058)
License	0.193* (0.076)	0.370** (0.090)	0.251** (0.068)	0.225** (0.064)
Not at site	0.171* (0.083)	0.167 ⁺ (0.089)	0.130 ⁺ (0.069)	0.141* (0.064)
Metro	0.040 (0.108)	0.136 (0.105)	0.104 (0.082)	0.148* (0.074)
Male	-0.082 (0.084)	-0.013 (0.096)	-0.057 (0.063)	-0.099 ⁺ (0.055)
Marital	-0.189* (0.080)	-0.327** (0.117)	-0.282** (0.070)	-0.386** (0.062)
Employed	-0.009 (0.087)	-0.096 (0.110)	-0.083 (0.073)	-0.132* (0.067)
Observations	15,331	15,331	15,331	15,331

Results from zero-inflated negative binomial regression. Independent variables also include Census region, income group, education, race, and age group dummies. Prediction of overrepresentation of zero outcomes includes metro, male, marital, employed, Census region, income group, education, race, and age group dummies — these coefficients are available from the authors upon request. Robust standard errors in parentheses.

+ significant at 10 percent; * significant at 5 percent; ** significant at 1 percent.

on attendance at musicals and plays. Regulation of scalping practices results in a 14–45 percent increase in the number of performances attended. Licensing regulations (requiring that individuals hold a state or city license before they re-sell tickets) have the strongest impact on attendance, leading to a 21 percent and 45 percent increase in the number of musicals and plays attended, respectively, a 29 percent increase in total theater performances (plays and musicals together), and a 25 percent increase in attendance at all types of live performances (plays, musicals, dance, and opera).¹⁷ This may suggest that licensed brokers are able to reach consumers that theater box offices do not, and may do so with more success than unlicensed scalpers in markets where resale is unregulated. It also implies that consumers value a regulated secondary market — when a broker is licensed the consumer can purchase a ticket in the resale market without being concerned that the ticket is counterfeit.

Restrictions that forbid resale at the event site and prohibit resale above the ticket’s face value also increase attendance. The restriction on resale at the event site may result in a lower nuisance-factor for attendees while the prohibition against resale for profit may result in lower ticket prices for consumers. With both of these types of regulation consumers retain the option of re-selling their tickets, should they find themselves unable to attend at the last minute (in the case where resale is prohibited at the event site tickets can still be resold online or in other locations). Thus, it appears that consumers value regulations that still provide them with a safeguard in case they cannot use a previously purchased ticket.

Production

We explore how the number of per capita productions in each region relates to the region’s demographics and ticket resale laws. We estimate a reduced-form

regression measuring the unique number of TCG productions per capita in each region i in year t :

$$\begin{aligned} productions_{it} = & \gamma_0 + \gamma_1 not\ at\ site_t + \gamma_2 not\ above\ face_t \\ & + \gamma_3 license_i + \mathbf{X}_{it}\phi + \eta_{it}. \end{aligned}$$

The dependent variable is the per capita number of productions by TCG theaters in each region.¹⁸ We estimate the regression separately using our two constructed data sets at the MSA level and state level, and we use per capita measures to adjust for the population sizes of each region. On the right-hand side, we include measures of the degree of anti-scalping regulation. The vector \mathbf{X} contains regional dummy variables as well as each region's demographics — that is, average age and the fraction of the population for each income bracket, ethnicity (white, black, Hispanic, and other), gender, marital status, and college-educated.

If scalpers do lower the (expected) profits of producers, then we would expect to see fewer entrants in markets where ticket scalping is unregulated; fewer unique productions would lead to a decreased variety in shows. On the other hand, if scalpers raise the profits of producers by acting as “insurance,” we would expect to see increased entry and number of productions in markets where scalping is legal without restrictions. Finally, if scalpers simply extract profits that producers would not be able to obtain otherwise, then we would expect to see increased consumption (tickets sold) and no effect on the number of productions; for any given performance, scalpers would be selling tickets that would be left unsold in their absence [Swofford 1999].

Table 5 reports the results of our OLS regressions. The regressions also include year dummies and the fraction of the population within each state (or city) that falls within a given income bracket. The results are qualitatively similar across the two samples. Column (1) contains the regression at the metropolitan level, and column (2) contains the regression at the state level. We find that the presence of a license requirement is correlated with fewer unique productions per capita. Similarly, prohibiting resale above face value is also correlated with a lower number of unique productions. Thus, it appears that these types of regulation inhibit the ability of scalpers to act as promoters and insurers for producers, and therefore discourage entry by some producers.

Given that attendance increases under these same regulations, this suggests that consumers value regulation that may lower resale prices and require licensing of re-sellers over increased variety in performing arts markets. On the one hand, if laws that prohibit resale above face value do curtail prices, then we would expect attendance to increase when prices fall. On the other hand, if these laws also lead to less variety in the market (fewer productions), we would expect attendance to decrease. The overall impact on attendance will depend upon which effect dominates. Since equilibrium attendance increases, this is consistent with consumers valuing regulation that restricts prices over greater product variety.

CONCLUSION

Economic theory makes conflicting predictions regarding the efficiency of unregulated secondary markets for event tickets. Allowing ticket scalping to be unregulated may lead to higher consumer and producer surplus by enabling trades that reallocate tickets to those with the highest willingness-to-pay. On the other

Table 5 TCG productions

	(1) <i>MSA/CBSA</i>	(2) <i>State</i>
License	-6.005 ⁺ (3.414)	-3.176* (1.606)
Not at site	-0.020 (2.078)	4.105* (1.958)
Not above face value	-4.410* (1.761)	-3.270* (1.372)
Year	0.293 (0.604)	-0.461 (0.562)
Midwest	-11.314** (2.851)	-6.576** (2.342)
South	-9.523** (3.549)	1.746 (3.067)
West	-6.273 (3.981)	-9.973** (2.800)
White	17.137** (5.531)	18.008** (5.505)
Black	7.357 (14.279)	-22.801 (14.217)
Hispanic	2.066 (8.320)	-18.809* (7.528)
Male	-38.480 (71.755)	-9.548 (86.663)
Married	0.481 (31.025)	-436.676** (42.176)
Age	0.233 (0.355)	0.318 (0.481)
College	76.747** (28.608)	182.336** (28.951)
Observations	489	225
R ²	0.190	0.788

The dependent variables are the total number of TCG productions per capita (000's) in a metropolitan area and in a state. Column (1) contains municipal as well as state laws that apply in the MSA. Column (2) contains state-level laws. All regressions contain year dummies and income variables measure the fraction of the population within each state (or city) that falls within a given income bracket. Robust standard errors in parentheses.

+ significant at 10 percent; * significant at 5 percent; ** significant at 1 percent.

hand, some theoretical models predict that the presence of scalpers in the market can lead to inefficiencies if the scalper captures profits that would have accrued to the producer in his absence. In this situation, future quality and product variety might fall if producers are losing profits that would otherwise have been reinvested in the market [Courty 2003a]. We use two unique data sets to empirically investigate the effects of anti-scalping regulation on attendance at performing arts events and on the number of unique productions mounted. We assemble a unique data set of state and municipal scalping regulations, and we test if various types of regulation lead to increases or decreases in consumption and production of theater performances.

Our empirical results reveal that all forms of tested regulation (i.e., licensing requirements, prohibiting resale for profit, and prohibiting resale at the event site) lead to increases in theater attendance relative to locations where scalping is allowed with no oversight. We find that two types of regulation — licensing requirements

and prohibiting resale above face value — lead to lower product variety relative to markets where scalping is unregulated, possibly because regulations impede the ability of scalpers to behave as insurers for producers, particularly in cases where local demand may be uncertain. It therefore appears that consumers value oversight and lower prices in the market for tickets above greater product variety. Consumers choose to attend more productions — even with a smaller choice set — when the secondary market is regulated than when it is not.

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Notes

1. See (Office of Congressman Bill Pascrell [2009]) www.pascrell.house.gov and (Office of Senator Charles E. Schumer [2009]) http://schumer.senate.gov/new_website/record.cfm?id=311221 for details.
2. Jeff Jacoby, “Scrap Scalping Laws,” *Boston Globe*, August 8, 2007.
3. For this reason, prominent economists have often come out in favor of unregulated secondary markets. See, for example, Stein [2005].
4. Courty [2003a] formally models this situation and demonstrates that the economic efficiency of unregulated secondary markets is theoretically ambiguous. In this model, Bertrand competition between the scalper and the producer implies that the scalper is always able to price-undercut the box office, so that some producer surplus is transferred to the scalper. This might be inefficient if this transfer is a “leak” out of the market, that is, if in the absence of scalpers the producer would have reinvested those profits into higher-quality future productions, raising both consumer and producer surplus.
5. The data also include information on attendance at operas, ballets, and other dance performances. These events are included in the “any live performance” category in our models.
6. <http://www.tcg.org>.
7. The Roundabout Theatre Company, Lincoln Center Theater, and Manhattan Theatre Club have performances at these venues.
8. When counts from the two sources disagreed, we used the information from the theaters’ archives. We also restrict our sample to theaters that offer paid performances; we drop theaters that only provide free programs—for example, children’s workshops.
9. If the linear interpolation resulted in a negative value, we used the value from the immediately preceding or succeeding season. Our results are not sensitive to the linear interpolation, as we include a time trend and have no time-variation in our laws. (See next section for estimation.)
10. During our sample period, these six excluded states did not contain theaters that were members of the Theatre Communications Group.
11. In a few instances, cities within the same metropolitan statistical areas had different laws; we assigned the most stringent regulation to the corresponding metropolitan area. Our results are also qualitatively similar when we omit these cities from the sample.
12. Starting in 2005, the CPS changed its definition of metropolitan areas from metropolitan statistical areas (MSA) to core-based statistical areas (CBSA). Metropolitan areas with missing demographic or population information were dropped; due to confidentiality reasons, demographic information is missing for smaller metropolitan areas.
13. We compute the population in each MSA or state using the counts in the CPS and scaling up by the total US population in the corresponding year.
14. Note that we are estimating the reduced form equation of the equilibrium attendance in the market. The equilibrium attendance is a function of the exogenous characteristics of demand (such as demographics) and supply (such as ticket resale laws). Our estimating equations can be interpreted as the reduced form regressions of equilibrium quantities in the market. For instance, if the demand

and supply for theater can be expressed as:

$$Q_d = \alpha_1 P + \alpha_2 X_d + \varepsilon_d \quad (\text{demand equation})$$

$$Q_s = \beta_1 P + \beta_2 X_s + \varepsilon_s \quad (\text{supply equation})$$

then the market equilibrium will be determined by $Q_d = Q_s$. Solving these two equations simultaneously gives us the reduced form expression for equilibrium quantity in the market:

$$Q^* = \gamma_1 X_d + \gamma_2 X_s + v$$

where X_d and X_s are the exogenous characteristics of demand and supply, $\gamma_1 = \alpha_2 - (\alpha_1 \alpha_2) / (\alpha_1 - \beta_1)$, $\gamma_2 = (\alpha_1 \beta_2) / (\alpha_1 - \beta_1)$, and v is an error term that is a function of ε_d and ε_s .

15. We run our regression for four outcomes, which are not mutually exclusive: musicals, plays, theater performances, and total performances. Theater includes musicals and plays, and any live performance includes musical plays, opera, ballet, and other dance.
16. For each of the four regression outcomes, chi-square goodness-of-fit tests reject the hypothesis that the data are Poisson, and likelihood-ratio tests confirm that the negative binomial regression model is preferred. Vuong [1989] test confirms that the zero-inflated negative binomial model is preferred to standard negative binomial. OLS produces results that are qualitatively and quantitatively similar.
17. To get an idea of what this implies for the absolute (rather than percentage) increase in attendance, note that a 45 percent increase in the number of plays attended corresponds to an increase of 0.1 additional plays for the average individual in a non-law state (since the mean number of plays attended in non-law states is 0.23). The sizes of the attendance increases interpreted in this manner are consistent with those obtained from OLS regressions with logged dependent variables (which are therefore conditional on positive attendance, since the natural log of zero is undefined). In that model, licensing restrictions lead to an 11 percent increase in the number of plays attended conditional on attending at least one play. The average attendee in a non-law state views 2.11 plays per year. This therefore implies that the presence of a license requirement would cause the average theater-going individual to view an additional 0.2 plays. Complete results from the OLS semi-log model are available from the authors upon request.
18. Note that we are estimating the reduced-form equation for the number of unique productions in each market as a function of the market's exogenous characteristics. Similar to our discussion of the estimation of attendance, the equation for product variety is also a reduced form equation of the number of unique productions within a geographic locale.

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