The COVID-19 Intermission: Economic Analysis and Public Policy Implications for Broadway

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Broadway producers face the daunting task of estimating the future success of their shows. Ticket price, capacity constraints, and critic and audience perceptions can either make or break a show. Previous research examined price discrimination exercised by show producers and focused specifically on its use in maximizing profits. Less literature exists on the variables that impact show longevity.

Within this paper, I analyze the Tony Awards' impact on a show's gross revenue and its longevity. It is hypothesized that the number of awards a Broadway show receives increases both total gross revenue and total number of performances. Time-series data for original musicals from 2009-2019 track weekly gross revenue, number of performances, and number of Tony Award wins. Results from an Ordinary Least Squares (OLS) regression reveal that an increased social media influence paired with reliance on both formal and informal reviews (word-of-mouth advertisements) have caused the awards themselves to lose sway over influencing theatregoers' decisions. The act of being nominated for and ultimately winning an award no longer exhibits the same impact it once did.

Due to the shutdown of all Broadway productions in March 2020, this research, like many other New York City entertainment options was interrupted by the COVID-19 pandemic. A brief analysis of the Save our Stages (SOS) act passed by Congress in December 2020 highlights how the industry plans to recover from the financial losses incurred.

In an effort to expand and update Broadway literature published prior to 2009, this research determines the Tony Awards' impact on gross revenue and longevity from 2009 to 2019. This paper begins with literature review and theory sections highlighting unique aspects of the Broadway market. A description of the data and methods used in this research precedes a section detailing the results of the regression and event study analyses. Implications of the Save our Stages Act comprise the public policy overview. Finally, a conclusion compares this analysis to previous literature by highlighting the changing influences to gross revenue and longevity within the theatre industry. This final section also offers the projection that the SOS legislation will offset the financial burden associated with the COVID-19 pandemic and strengthen the industry, signifying the growth potential available post-pandemic.

II. Broadway Defined

Before proceeding, it is important to understand what makes theatre in New York City 'Broadway.' Appendix A provides a list of industry terms and definitions. The Theatre District is located in Midtown Manhattan, nestled between West 40th and 54th Street next to Times Square. Forty-one Broadway theatres that each seat 500 to 2,000 people call the Theatre District home.

Broadway seasons begin in late May and end in early June of the following year after the Tony Awards. Similar to film's Oscar Awards, the Tony Awards recognize the feats achieved by both

cast and creatives on Broadway and are hosted by the American Theatre Wing. Four times a year, the Tony Awards Administration Committee meets to determine the eligibility of every show. Following nomination announcements in late April, over 800 Tony Awards' voters determine winners in 26 different award categories. The winners are announced during a live ceremony held at Radio City Music Hall and also broadcast globally.

Broadway follows a unique performance schedule. Every show hosts eight performances per week and the days with a matinee and evening performance are known as 'two show days.' Actor's Equity union contracts also require every show to have one day a week (typically a Monday) be 'dark,' meaning they host no performances. Principal actors appear in the lead roles for every performance unless otherwise stated. At that time, an alternate, understudy, or swing covers the role. Theatregoers often choose which show to see based on which actors are currently cast members. The next section offers an in-depth review of previous research related to variables that impact Broadway gross revenue and longevity.

III. Literature Review

Broadway is a market often overlooked in economic research. Many researchers focus on the price discrimination practices utilized by producers, leaving wide gaps in other parts of the literature. These gaps include limited consideration of alternative variables (seasonal changes, show type, and awards season) that influence consumer choice. Studies about the gross revenue impact and survival rates of the Tony Awards are scarce or based upon data from prior to 2009. Related industries, such as film, use similar factors to determine overall success at the box office. Research from the context of film can offer valuable insights within the theatre industry. The remainder of this section is organized by the themes of common ticket pricing practices, additional influential factors, gross revenue, and longevity.

A. Ticket Pricing Practices

The manner in which shows earn the largest portion of their gross revenue establishes a base for understanding additional influences, such as pre-opening advertisements, critic reviews, and the timing of the opening. Ticket sales comprise the largest portion of earned gross revenue when compared to food, drink, and merchandise sales. Producers must identify a distribution of ticket prices that maximize gross revenue without deterring consumers.

Price discrimination serves as a commonly used practice in ticket pricing. Firms maximize their potential gross revenue by changing the ticket price based on the location of a seat. Known as a structured menu, orchestra seats on the first floor and closest to the stage cost more than seats in the balcony located at the top of the theatre. Tickets within the same section are also priced differently depending on how close they are to the stage (Leslie 2004, 527). Theatregoers possess the power to choose how much they want to spend on each show experience. Discount ticketing, including rush, standing room, and lottery tickets, increases accessibility to the theatre among consumers at varying income levels.

Alternative ticketing option practices contribute mixed results. A study of the 1996 Broadway play *Seven Guitars*, uses a discrete-choice random-utility model to determine the difference between a uniform price menu (same price throughout) versus a structured price menu. When no discount options are available, structured price menus increase gross revenue from 1.6 to 7.3 percent (Leslie 2004, 536-539). However, producers prefer sold-out shows and achieve this by maximizing the number of advance tickets sold. From a ticket buyer's perspective, a sold-out show signals higher quality than a show that earns its entire potential gross revenue. Therefore, pricing can prove to be challenging. Fluctuations in consumer demand make it difficult for prices to respond quickly in the short-run. Often times, producers will not change prices to match the demand due to operating costs associated with reprinting tickets and altering advertisements (Courty 2000, 171). Yet, the opportunity to sell out on the day of the performance remains.

To mitigate unsold tickets on the performance date, secondary brokers operate discount services, such as the TKTS booth located in Times Square and online services like TodayTix.com and StubHub.com. These allow producers to offset the cost associated with changing prices. Discount ticket booths provide a means for filling seats and making a profit, but require carefully determining the right dollar amount to discount and how many discount tickets to sell (Leslie 2004, 539). To ensure producers still make a profit, the quantity of these tickets is heavily limited and, speaking from personal experience, last-minute tickets can be hard to come by.

B. Additional Influences

In addition to price discrimination, numerous other variables impact the economic vitality of Broadway shows. Simonoff and Ma (2003, 137-149) conduct an empirical study on the other factors (pre-opening advertisements, critic reviews, and the timing of the opening) that complement the Tony Awards. Using a hazard model, these authors find that Broadway's pre-opening advertisements are not as important to longevity as they are in the context of film.

Critic reviews exhibit a positive impact on longevity; however, the source of the reviews also matters. The *New York Times* was once able to make or break a show's financial success. The *Daily News* has since replaced them as the leading influencer. The date a show chooses to open represents another strong factor. During the summer months, New York City socialites move from their upscale Manhattan apartments to their Long Island vacation homes. Shows with a high profile often delay opening until fall in response to this shift in the social scene.

Few economists focus research studies on the awards season. Sister industries like film bridge gaps left behind; these industries provide a roadmap for research on Broadway gross revenue and longevity. The next two subsections compare and contrast literature focused on gross revenue and longevity in the contexts of film and theatre.

C. Gross Revenue

To provide a familiar comparison to the Tony Awards, the film scene vies for coveted Academy Awards, more commonly known as the Oscars. Two studies examine the topic of Oscars and

movie gross revenue. Nelson et. al. (2001, 2-4) analyze a data set of 131 pairs of nominated and non-nominated movies with respect to their release year. Wins in a lead acting category create a 39.44 percent gross revenue gain. Best picture wins increase gross revenue almost 250 percent. Deuchert et. al. (2005, 161) continue the work of Nelson et. al. (2001) by expanding the data to include 2,244 films. They also establish a new cut-off rule that eliminates the lowest-ranked, nominated movie from each release year.

Deuchert et. al. (2005, 162-170) use two models, one with a time-dependent aspect and a control model without, to determine how long nominations and wins impact the market. In Model I, best acting and best picture categories exhibit positive increases on gross revenue. When time is factored in, it exerts an impact within a four to 29-week window. The act of winning an award prompts a delayed reaction of nine to ten weeks following the ceremony. The models developed in these economic studies of the film industry inform Broadway research focused on gross revenue such as the work of Boyle and Chiou (2009, 54-63).

However, unlike my research focused on changes in gross revenue, these authors examine how the Tony Awards alter consumer demand and market share among nominated versus winning shows. Together, they use a cross-sectional, fixed effects regression and a discrete-choice model for the June 1996 to September 2007 seasons. Results conclude that nominations exert a positive effect during the typical five-week period preceding the awards ceremony. As word-of-mouth advertising spreads, each production's market share increases by three percent. Once the winners are announced, winning productions experience growth in gross revenue of $61,000 in the weeks following the ceremony, compared to a $16,000 gain from a nomination. Other factors influenced by the Tony Awards include the survival rates and longevity of each show as summarized in the next subsection.

D. Longevity

Hazard functions measure the likelihood a show will survive dependent on different outcomes. Each additional Tony Award win decreases the risk that a show will close by 41.1 percent and can signal higher quality, more advertising opportunities, and enhanced visibility to potential consumers. Conversely, a loss introduces a 29.5 percent increase in risk (Simonoff and Ma 2003, 144). The function can change based on the number of performances as well. Under Weibull and Cox's proportional hazard model, each additional performance decreases the likelihood of a show closing; however, each additional year open increases performance numbers 98 percent, holding all other variables constant (Maddison 2004, 641-642).

The type of show represents another factor of survival. Musicals tend to out-perform plays and originals last longer than revivals. Hazard functions for musicals are typically lower than plays (Simonoff and Ma 2003, 146). Musicals often appeal to a wider consumer base, particularly tourists. Most plays on Broadway highlight more serious content and have an overall shorter lifespan. Conversely, musicals provide a wide array of topics with open-ended runs. With three Disney productions running through the 2019 season, a new jukebox musical arriving on the scene every season, and classics that remain tried and true, endless choices exist for consumers of all ages and interests.

Originals also exhibit longer survival rates. While the risk associated with presenting new material is higher, audiences often reward high quality original shows (Maddison 2004, 642-643). Another Weibull distribution approach by Boyle and Chiou (2009, 63-66) finds that musicals outlast plays and limited runs exit earlier than open runs. This research could explain why only original musicals tend to have runs that span multiple seasons. The longest-running show, *The Phantom of the Opera,* celebrated thirty-two seasons on Broadway in January 2020.

Similar phenomena occur in the film industry when movies are nominated and win Oscars. Award-winning movies realize gross revenue gains from both nominations and wins (Nelson 2001, 6-10). Nominations exert the strongest impact between their announcement and the five to six weeks before the ceremony; after that, their strength diminishes. Wins increase gross revenue the most in the month following the awards show (Deuchert et. al. 2005, 169). Movies, however, are much different from live theatre because they can be rereleased and made readily available for post-screenings through DVDs and digital streaming services. Deuchert et. al. (2005, 169) remarks that winning an Academy award does not increase run time, but nominations in specific categories do. The ability to purchase and watch a film long after its release means the Oscars survival effects are diluted by time compared to the Tony Awards.

E. Contribution

The limited number of studies conducted relative to the Tony Awards highlights several research avenues to pursue. Within the research presented in this paper, there is a more in-depth analysis of the awards' impact on *both* gross revenue and survival rates. Newer data from the 2009-2019 seasons also provide an updated view. A discussion of consumer and producer market influences informing the variables used in this study follows.

IV. Theory

This study considers two working hypotheses. First, weekly gross revenue for a Broadway show will be positively impacted by each Tony Award a show wins. Consumers are expected to be drawn to winning shows because when the number of wins increases, both demand and gross revenue for that show increase. Typical tourists in New York City with limited Broadway experience rely upon word-of-mouth advertising rather than doing their own research when selecting a show.

Second, the longevity of a Broadway show, measured in the number of regular performances, increases with each additional win the show receives. Similar to gross revenue, it is expected that demand increases since consumers are drawn to winning shows. In turn, the overall number of performances during a show's lifetime increases.

Within the theatre industry, producers and consumers share an important role in influencing supply and demand, respectively. Producers are responsible for bringing new shows to Broadway each season and maintaining quality and popularity. Consumers possess the most power when it

comes to determining which shows stay and which shows close. The next two sections focus on each group's unique role within the industry.

A. Producer Behavior

The Broadway theatre industry's supply curve represents producer behavior. Producers decide which shows open on Broadway and how long they run. On average, 40 new productions open each season (Broadway League, n.d.). When a season has many new shows (an average of 37 new productions opened each year between 2009 and 2019), the supply curve shifts to the right and more tickets are sold at a lower price. The curve shifts when shows open and close, but supply remains relatively inelastic in the short-run. Since only 40 theatres qualify as 'Broadway' within the Theatre District, a strict capacity constraint exists. Multiple theatres house more than one production (typically plays or limited runs) during a season; however, the maximum number of shows on Broadway at one time remains capped at 40. An analysis of supply-related variables follows.

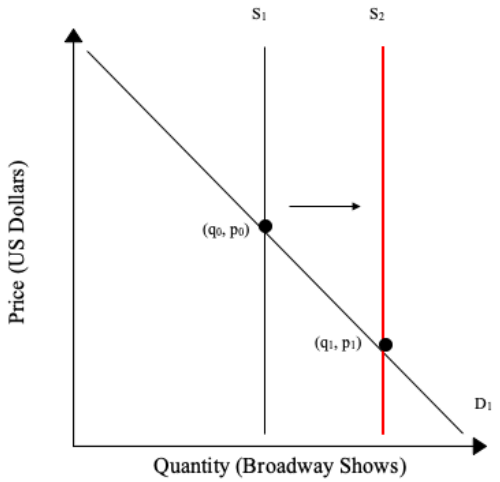

Figure 1: Tony Award Impact on Supply

Capacity constraints keep supply inelastic in the short run. Due to the time consuming process of bringing new material to the stage, producers cannot quickly respond to market changes. The most they are able to do is close a poor-performing or revenue-losing show. In the long run, producers can adjust by altering ticket prices, changing theatres, or adopting cost-saving measures.

Producers favor Tony Award wins in any category with wins signaling that a show is worth the investment risk. However, the awards have little impact on influencing current supply. There is no shift in supply because awards do not make it possible to reopen a closed show. Future supply can be impacted by the Tony Awards as seen in the shift from S_1 to S_2 in Figure 1. A producer whose show wins will be more likely to offer additional material in the future. On the other hand, losing an award represents a decrease in supply among producers.

B. Consumer Behavior

The demand curve depicts consumer's interests. Whenever consumers purchase tickets, their collective actions shift the Broadway theatre's industry demand curve. In the 2018-2019 season, New York City theatres drew a record high of 14.77 million attendees, increasing from 13.79 million tickets sold the previous season (Broadway League, n.d.). Note that these values include repeat customer visits. When the number of tickets sold increases, the demand curve shifts to the right. However, given a capacity constraint, the higher attendance numbers cause an increase in price because the quantity of tickets demanded exceeds the quantity of tickets supplied; in this context, each seat becomes more valuable. Demand changes caused by the variables used in this study are analyzed next.

Theoretically, the award categories have differing influences on demand. An average consumer, who attends four performances per year (Broadway League, n.d.), does not do extensive research into the shows available. Instead, this type of consumer acquires answers to questions such as: Who is in the cast?, What do other people think of the show?, etc. Wins in a performance-based category stand out the most to the average theatregoer. Contrarily, technical (behind-the-scenes) category wins' appeal to professional and frequent theatre audience members. Winning in any category causes a rightward shift in demand (Figure 2). However, it is expected that acting category wins generate rightward shifts of a larger magnitude than wins in the technical awards category.

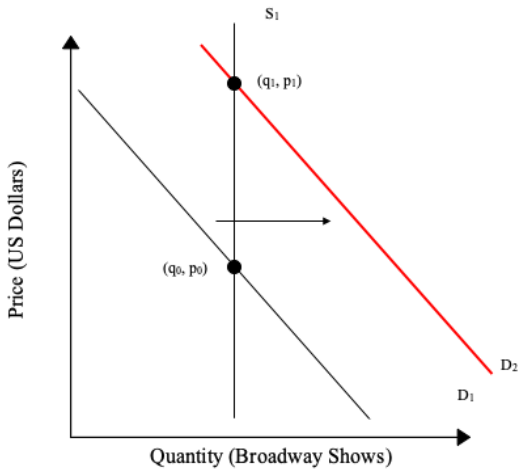

Figure 2: Tony Award Impact on Demand

Reviews act as another demand-related variable. Consumers utilize reviews to determine the true value of their ticket. Besides the Tony Awards, theatregoers pay attention to word-of-mouth advertising (Courty 2000, 186-187). When a show receives high praise, demand is more likely to shift rightward. A consumer relies on reviews to determine the potential value of attending a show or to reduce the risk of buyer's remorse from attending a disappointing production.

Conversely, the number of performances has a relatively low impact on demand. Longer running shows gain the recognition of exhibiting higher quality, extending their longevity. *The Phantom of the Opera* and *The Lion King*, for example, hold decades-long runs, earning themselves the title of being a New York City tourist attraction. However, while there is an almost constant demand for those time-tested shows, demand remains static with no major observable shifts. Without high performance numbers, shows newer to the market rely on other factors, such as word-of-mouth advertisements, to increase their demand.

C. Equilibrium

Together, producers and consumers create an equilibrium of the market price and quantity of Broadway tickets. A Broadway show will not last as long if theatregoers reveal limited demand for it nor will producers want to keep supplying such performances. A surplus of shows offered decreases overall Broadway attendance averages. A shortage of shows induces price spikes when a lower quantity supplied and higher quantity demanded coincide. Producers' and consumers' interactions affect the efficiency of the market. Details regarding the data and methods used to analyze the Broadway theatre market comprise the next section.

V. Data and Methods

The Broadway League (www.broadwayleague.com) tracks weekly data in actual gross revenue, gross revenue potential, average and top ticket prices, number of seats sold, percent capacity sold, and the number of (preview and regular) performances. Publicly accessible, real-time data are available for every Broadway show since 1984. This study uses original musical data from 2009-2019. All gross revenue is adjusted for inflation to March 2020 dollars using the Bureau of Labor Statistics' (BLS) All Items in New York-Newark-Jersey City, NY-NJ-PA, all urban consumers, not seasonally adjusted Consumer Price Index (CPI) (www.bls.gov).

Reviews measure critical responses as collected by the New York Theatre Guide (NYTG) (www.newyorktheatreguide.com) and ranked on a scale from one to five stars. A one-star ranking means the critic does not recommend seeing the show whereas five-star rankings characterize productions of the highest quality. Yet, bias exists since each show is limited to one review. While other sources for measuring show ranking were considered, these were not selected because they did not include all shows in the dataset.

Similar to Boyle and Chiou (2009, 60), the Tony Awards wins are separated into an acting category and a technical category. Acting category awards focus mainly on performance and include the best actor/actress in a musical/play and best featured (supporting) actor/actress in a musical/play awards as well as best musical/play, best revival of a musical/play, and best director. Technical category awards honor a majority of the behind-the-scenes work and consist of the following awards: best costume design, best sound design, best lighting design, best musical score, best book, best choreography, and best orchestrations. Special recognition and engagement awards are excluded from this study.

Due to shows being able to open at any point during the season, a cut-off rule was established. Deuchert et. al. (2005, 162) first introduced a cut-off rule in their film study so that the lowest-ranked, nominated movie of each season became the baseline. In my study, the cut-off rule ensures that every show in the dataset opens around the same time period. This was important in terms of longevity to ensure no show skewed the results due to a higher number of performances. Outlined next are the details of the cut-off rule.

A. Cut-Off Rule

Data are observed over 45 weeks beginning with the first full week of May for each season for years 2009 – 2019. The Tony Awards are held during the sixth week of each season. Over the span of ten seasons, 407 shows opened within their nomination-eligible window. A cut-off rule eliminates any show that either did not open between March or April or closed prior to its respective season's awards ceremony. The two-month opening period sets a baseline for longevity in the context of this research. Consequently, no show possesses an advantage of a longer run time prior to the Tony Awards. Overall, 22 musicals made the cut for inclusion in this study.

Every show's number of wins is recorded using data from the American Theatre Wing's Tony Awards Administration Committee (www.tonyawards.com). For each season, a winning show is paired with a control, non-winning show. Appendix B lists characteristics of the 22 shows comprising the 11 show pairs included in this analysis.

Originally, currently running shows were not included in this analysis. However, due to the spread of COVID-19, all Broadway performances halted on March 12th, 2020. This closure led to the inclusion of the active productions of *Ain't Too Proud* and *Come From Away* in the set of show pairs. It is unclear at the point of this research whether they will re-open following the shutdown. For the purposes of this paper, the final performance to count for longevity occurred on March 12th, 2020. A description of analysis methods follows.

B. Analysis Methods

Two Ordinary Least Squares (OLS) regressions measure the Tony Awards impact on the dependent variables of gross revenue and performances as displayed in Equations 1 and 2.

(1) $\mathbf{GROSSREVENUE_i} = \beta_0 + \beta_1 ACTING_i + \beta_2 TECHNICAL_i + \beta_3 PERFORMANCES_i + \beta_4 REVIEWS_i + \varepsilon$

(2) $\mathbf{PERFORMANCES_i} = \beta_0 + \beta_1 ACTING_i + \beta_2 TECHNICAL_i + \beta_3 GROSSREVENUE_i + \beta_4 REVIEWS_i + \varepsilon$

In Appendix C, Table 1 lists each variable and its coefficient's expected sign (all positive), while Table 2 provides descriptive statistics. It is important to note that the average number of acting category wins (0.409) is less than the average number of technical wins (0.591). Wins in the technical category also appear to be more concentrated, meaning that the range of these wins spans from zero to four when non-winning shows are included in the spread. The exclusion of non-winning shows changes the range to one to four for technical category wins. Acting category wins' span from one to five.

An event study offers a complementary analysis to the OLS regression by providing a visual representation of the timeframe studied. Average gross revenue demonstrates the relationship *between* paired shows over 45 weeks which is not revealed by the coefficients of the independent variables within the OLS regression. The event study visuals displayed in Figures 3 and 4 exhibit these relationships.

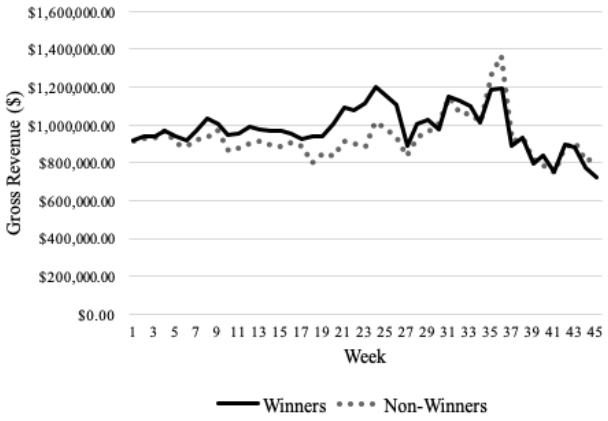

Figure 3: Average Gross Revenue

Figure 3 displays total average gross revenue for the winners and non-winners overall. The solid dark line represents wining shows and the dotted line represents non-winning shows. Both lines measure the changing average gross revenue during the 45-week period. As shown in Figure 3, Tony Award winning shows trend higher in average gross revenue during the sixth through twenty-third weeks. Beyond that point, winning and non-winning shows' average gross revenues converge and exhibit little to no difference.

Figure 4 measures the average gross revenue differences between each pair. This figure relates to Figure 3 by showing the divergence of winning and non-winning shows' average gross revenues between weeks 6 and 23 and then subsequent convergence in the remaining weeks. Negative values imply non-winning shows' average gross revenue exceeds that of winning shows.

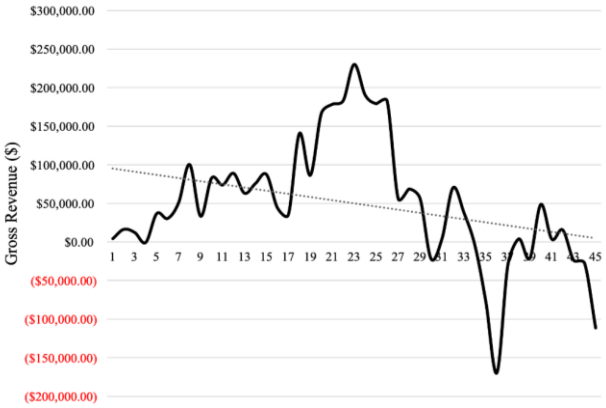

Figure 4: Average Gross Revenue Difference

Unanticipated results, revealed within Figures 3 and 4 when the non-winning shows trend higher, are highlighted within the Results section that follows.

VI. Results

The previous section summarized the data and methods used in this research and a discussion of regression and event study results comprises this section. In the first half of this section, the focus will be on the gross revenue impact. Gross revenue yields different results than

hypothesized. The second half of this section revisits longevity in the context of Broadway theatre. Longevity reveals a market change due to consumer impact.

A. Gross Revenue Impact

An event study incorporates the averages of the winning and non-winning groupings over an observation window of 45-weeks (Figure 3). Both groups exhibit the same averages for the first five weeks. After the sixth week, when the Tony Awards occur, the winning shows begin to diverge. Winners in the sixth week average gross revenue of $914,947.12 whereas non-winners average $884,420.42. Post-Tony Awards, the difference in gross revenue between winners and non-winners totals $30,526.70 and later peaks at $230,211.65 in week 23 (Figure 4).

In Figure 3, winners generate higher average gross revenue than non-winners until week 26. At that time, three winning and three non-winning shows closed. The event study reveals that there is a 20-week window where gross revenue is positively impacted by a Tony Award win in *any* category. For the remaining weeks, no noticeable differences exist. By week 26, summer tourism ends and new shows enter the market.

Table 3 displays the OLS regression results when gross revenue serves as the dependent variable.

Table 3: Gross Revenue Regression

Independent Variable	Coefficient	t-Statistic	P > |t|	VIF
CONSTANT	$260,345.10	5.29	0.000	-
ACTING	-$79,479.55	-4.83	0.000	1.20
TECHNICAL	$27,082.45	2.05	0.041	1.48
PERFORMANCES	$975.04	26.60	0.000	1.26
REVIEW	$4,393.72	0.27	0.788	1.68
R-Squared	0.477			
Adjusted R-Square	0.475			
F-Statistic	224.62			

The acting category awards and performances variables are significant at the 1% level while the technical award variable is significant at the 5% level. The review variable is not significant at either of these levels. All variables, except acting category wins, display the positive expected signs. An analysis of the show pairings reveals that some of the non-winners had higher weekly gross revenue than their winning counterparts, potentially explaining the negative coefficient for this variable. Many of these shows have recognizable titles from popular movies, TV shows, or books, such as *The Addams Family* and *Anastasia*. This result could also reveal that adaptations

and familiarity are more important than awards to a general audience of theatregoers, although no variable differentiating audience type was included in this analysis.

Consumers of theatre can be segmented into two groups: casual and professional. Casual audience members focus on the surface-level details of the show they attend, such as the type of story set to unfold and past audiences' reactions to the performance. Professional theatregoers are more invested in the intricate workings of a musical and focus on who won and who lost at the Tony Awards. Similar to those in the casual consumer group, the professional audience group considers whether their peers liked the show or not when deciding which show to see. Future models can be expanded to include consumer-specific variables to reflect audience demographics and to segment casual versus professional audiences.

B. Longevity Impact

Similarly, show longevity reveals different results than hypothesized with some of the non-winning shows out-running their winning paired show. Out of 11 pairs, four non-winners exceed the winning show's number of performances and two pairs exhibit a difference of fewer than 20 performances (Figure 5). Familiar titles that did not win any awards can still have long runs because consumers often readily evaluate the quality of a *current* production based on the quality and familiarity of the *original* version.

The adaptation of a mainstream movie to the stage can be a low-risk option for producers. If the show is a winner, like *Matilda the Musical* (Pair 5), the production runs for years. Even a non-winning show such as *Anastasia* in Pair 9 holds the third highest number of runs in the dataset. Both benefit from having recognizable, and family-friendly titles that appeal to a broad audience of consumers. Audiences know what to expect when purchasing their tickets to these productions, suggesting longevity can be impacted by factors beyond just the Tony Awards.

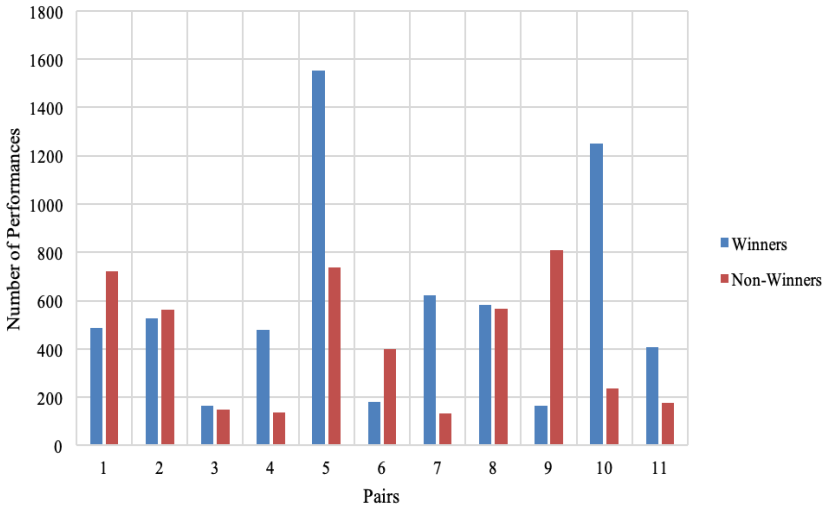

Figure 5: Performance Comparison of Winners and Non-Winners

Unlike the gross revenue regression, the longevity regression in Table 4 exposes that an acting-based award yields a higher number of performances (70.12) than technical-based awards (28.58). Therefore, the general audience member places more importance on the actors and actresses. Details such as costumes, scenic design, and lighting design are less important to this

audience. This could suggest that the average consumer examines the production as a whole rather than focusing on its individual parts.

Critical review is another variable with an interesting coefficient (51.75). This value is higher than the impact from technical category wins, suggesting that both formal and informal (word-of-mouth) reviews exhibit stronger influences. Online sources, like social media, make these resources readily available. Consumers no longer have to rely on the Tony Awards as the only signal of quality.

Table 4: Longevity Regression

Independent Variable	Coefficient	t-Statistic	P > |t|	VIF
CONSTANT	-35.72	-1.08	0.281	-
ACTING	70.12	6.49	0.000	1.18
TECHNICAL	28.58	3.27	0.001	1.47
GROSS	0.000	26.60	0.000	1.11
REVIEW	51.75	4.82	0.000	1.64
R-Squared	0.539			
Adjusted R-Square	0.537			
F-Statistic	287.55			

Both regressions suggest that Broadway is changing. Consumers no longer react the same to industry award shows. Whereas other studies find positive impacts across the board from awards in both gross revenue and performances (Simonoff & Ma, 2003, 142-149; Boyle & Chiou, 2009, 58-66; and Maddison, 2004, 639-643), these data suggest that audiences are straying away from using number of wins as a sole measurement of quality. Instead, formal and informal (word-of-mouth advertisements) reviews are at the early stages of becoming a more important part of the consumer's decision-making process

VII. Public Policy in the context of Broadway

The Save our Stages (SOS) Act was introduced in the Senate on July 22, 2020 and passed in late December 2020. Congress will now provide $15 billion in order to "authorize the Small Business Association (SBA) to make grants to eligible live venue operators, producers, promoters, or talent representatives to address the economic effects of the COVID-19 (i.e., coronavirus disease 2019) pandemic on certain live venues" (U.S. Congress 2020). Co-sponsored by Senators John

Cornyn [R-TX] and Amy Klobuchar [D-MN], the bi-partisan bill allows live venues to make payments on expenses such as rent and utilities incurred between March 1st, 2020 and December 31st, 2020.

Broadway is one of the venue types that will see a positive impact from the bill. Since March 12th, 2020, the industry has experienced its longest shutdown period in history and along with it a record amount of lost gross revenue. Approximately 96,000 people were left unemployed and ticket sales dropped from $1.758 billion in 2019 (Broadway League, n.d.) to $300 million between January and mid-March 2020 (Whitten 2020). Correspondingly, New York City's relative tourism and hospitality tax collections declined in a noticeable manner over the same timeframe. According to the Broadway League (n.d.), tourists accounted for 65% of ticket sales and generated around $11.5 billion within the city's economy in 2019.

Passage of this legislation allows the industry with time to lighten the financial burden introduced by the COVID-19 pandemic. Fewer shows face risk of permanent closure moving forward: recall that since the shutdown, five shows (including two original musicals) announced they would not resume performances once COVID-19 restrictions are lifted. In concurrence, producers can set their sights on opening new productions that will be eligible for Tony Awards in the following seasons. In 2020, three out of four eligible original musicals were nominated for best musical compared to the five out of eleven eligible original musicals in 2019 (McPhee 2020; Tony Awards, n.d.). When the losses endured by the pandemic are offset through the SOS Act, the industry can begin to rebuild itself towards its former economic performance and open new shows.

VIII. Conclusion

Unlike previous research, the Tony Awards did not have a positive impact on gross revenue or longevity for years 2009 through 2019. Acting category wins decrease gross revenue while a technical win increases gross revenue. A growing world of televised awards ceremonies, B-Roll show clips on YouTube, and an increasing community of online bloggers makes theatre more accessible than ever before. The casual consumer enjoys increased access to information and no longer solely relies on awards as the signal of quality. Instead, theatre consumers can read the tweets, newspaper reviews, and other word-of-mouth reactions to the shows they want to see before entering the Theatre District.

Future models can be adapted to account for changes in consumer demographics. The Broadway League conducts a survey each season that measures age, race, income-level, and how many times someone has attended a Broadway performance in that year. A detailed analysis of the ticket buyers reveals insights related to the theatregoers. Measuring the use of social media as a covert means of advertisement should also be considered. Other recommendations for future research include analyzing the COVID-19 impact on gross revenue and longevity. The 2020 Tony Awards have been postponed due to the pandemic and the total financial consequences faced by Broadway are unknown at this point. Future research focused on the SOS legislation can determine the efficacy of this policy in the long term. For global comparison, London's West End is another major theatre scene and the models used here can be adapted to the Olivier

Awards as well. A final recommendation is to expand the types of shows analyzed to include originals and revivals of plays alongside musicals.

Broadway is changing in ways unwitnessed previously. This research highlights several interesting findings, such as changes in Tony Awards and audience impacts, and uncovers some variables to explore in future analyses. Consumers have more influence in terms of which shows are brought to Broadway and their longevity. While steadily increasing their influence over the market through word-of-mouth advertisements and the rise of online blogging and tweeting, the full impact of an audience is yet to be measured. In the context of Broadway, the economic and public policy research must go on!

IX. Appendix A

Terms and Definitions

Balcony: Third floor of the house, although not present in every theatre

Book: The script of a play or musical

Box Office: Where tickets are bought, located in front of house

Broadway: Theatre performed in houses that seat at least 500 people in New York City

Front of House: Location of the box office and front entrance of the theatre

Front (seating): Seats closest to the stage in each section

House: The space within the theatre where audience members sit

Lottery: Digital and in-person, drawn day of the show for a limited number of discounted tickets

Matinee: An afternoon performance, start time is usually 2 to 3 pm

Mezzanine: Second floor of the house, typically overhangs part of the orchestra

Musical: Typically performed in two acts, the plot is conveyed through song, dance, and spoken dialogue

Off-Broadway: Theatre performed in houses that seat less than 500 people in New York City

Orchestra (section): First floor of the house, closest seats to the stage are located here

Play: Plot is conveyed through straight dialogue, but background orchestrations are common

Principal: Main actor for a role who does not cover any additional roles

Rear (seating): Seats located furthest from the stage in each section

Rush: "Rushing the box office," tickets bought at a discounted price when the box office first opens for the day

Show: General term for a play, musical, or special event performed onstage

Standing Room: Offered in certain theatres, these ticket buyers stand the entire show but at extremely discounted prices

Swing: Performer who learns many roles and can cover any of them at short notice (and sometimes even covers multiple roles in one performance!)

Tony Awards: Awards recognition specific to Broadway theatre

Understudy: Typically, an ensemble member who also studies a lead role to fill in during a principal's absence

X. Appendix B

Show Pairs

Winning Show	Number of Performances	Number of Tony Wins	Review Score	Non-Winning Show	Number of Performances
Million Dollar Quartet	489	1	3	**The Addams Family**	722
Priscilla Queen of the Desert	526	1	3	**Sister Act**	561
Catch Me If You Can	166	1	3	**Baby It's You!**	151
Nice Work If You Can Get It	478	2	3	**Ghost**	136
Matilda the Musical	1554	4	5	**Motown**	738
Rocky the Musical	180	1	4	**If/Then**	401
An American In Paris	623	4	4	**It Shoulda Been You**	135
Fun Home	583	5	5	**Finding Neverland**	565
Bandstand	166	1	3	**Anastasia**	808
Come From Away	1251	1	4	**War Paint**	177
Ain't Too Proud	407	1	4	**Be More Chill**	177

All performance numbers are correct through March 12th, 2020. At the time of the study, *Come From Away* and *Ain't Too Proud* were currently running on Broadway, but halted due to the COVID-19 pandemic.

XI. Appendix C

Table 1: Variable Descriptions

Variable	Description	Measurement	Expected Sign
Gross	Weekly revenue earned	Dollars	(+)
Performances	Amount of shows performed during length of run	Numeric	(+)
Acting	Tony Awards won in an acting or performance-based category	Numeric	(+)
Technical	Tony Awards won in a technical (behind-the-scenes) category	Numeric	(+)
Review	Critic review rankings from New York Theatre Guide	Numeric	(+)

Table 2: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
GROSS	990	$748,150.60	$506,891.20	$0	$1,899,200.00
PERFORMANCES	990	502.27	357.85	135	1,554
ACTING	990	0.409	0.778	0	5
TECHNICAL	990	0.591	1.073	0	4
REVIEW	990	3.318	0.924	1	5

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