J Cult Econ (2011) 35:167–184
DOI 10.1007/s10824-011-9142-6

ORIGINAL ARTICLE

Factors that influence programming decisions of US symphony orchestras

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Received: 26 June 2010 / Accepted: 17 April 2011 / Published online: 13 May 2011

Abstract Program decisions by symphony orchestra management are influenced by various factors. To examine these factors, we create an objective index of the propensity of a symphony orchestra to perform the standard repertoire. We use regression analysis to examine factors that influence programming decisions of 64 US symphony orchestras in 2006–2007, including public and private sources of funding. We find that increased funding from ticket sales, endowments, and local government increases the likelihood that an orchestra will perform nonstandard repertoire. In addition, the results suggest that a symphony orchestra's music director does not have a significant impact on the degree of program conventionality.

Keywords Symphony orchestra · Repertoire · Funding

JEL Classification Z11

1 Introduction

Throughout the history of classical music, musicians have relied on patrons to supplement earnings. Today is no different for classical musicians. Indeed, for symphony orchestras (SO), the problem may be more acute; as Baumol and Bowen (1966) explained, SOs are unable to boost productivity to meet rising wages. Therefore, SOs must rely on sources such as private and government contributions to supplement the revenue generated by concert ticket sales. As Flanagan (2008)

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reports, SO deficits may be increasingly problematic, which may require increased levels of patronage.

The source of a SOs funding could influence programming, creating concern about the artistic integrity of classical music. For example, a SOs over-reliance on a patron (such as a local foundation), which prefers traditional programming, could limit the performance of innovative compositions, thus leading to a concern that many SOs perform compositions from a narrower spectrum of works than would have otherwise been the case. Many would agree with Botstein (2008) who suggests that SOs need to innovate in order to "survive and flourish." He contends that the financial difficulty that some orchestras are having is the result of performing only the standard literature. Just as technological innovations lead to economic progress, performing challenging musical compositions can lead to cultural progress.

Included among innovative programming would be contemporary compositions. The new ideas that evolve from experimentation may be important to create and encourage new directions in the art.[1] While concerns that SOs do not encourage contemporary composers enough persist, the cause of a lack of important contemporary music is debated. Various sources blame the audience, academy, broadcast media, recording companies, performers, conductors, or composers (Wichterman 1998).

In this study, we create a standard repertoire index (SRI): an objective measure of the uniqueness of a SOs repertoire, which can include compositions from any period. Thus, we measure the conventionality of a SOs programming relative to the programming of other SOs in the United States. That is, the standard repertoire will be the compositions that are performed most often by US SOs.[2] This measure of conventionality is similar to the approach used in studies of other arts organizations. We use the SRI to examine factors that may influence programming decisions by US SOs, including funding sources. To the best of our knowledge, this is the first such study for SOs.

2 Symphony orchestra funding

SOs have four principle sources of revenue as follows: earned income, private contributions, endowment funds, and government support.[3] SOs are nonprofit organizations that rely on nonperformance revenue for economic survival. Flanagan (2008) reports that nonperformance sources provide more than 50% of many US SO budgets. Concert income and other earned income produced an average of 37 and 8%, respectively, of SO budgets for the 2005 season (League of American Orchestras

[1] Historically, new compositions have often been poorly accepted initially. For example, at the 1913 premier in Paris of Stravinsky's *Rite of Spring*, the audience erupted into a yelling and fighting mob during the performance. Today, the *Rite of Spring* is considered to be one of the most important compositions in the entire repertoire and performed regularly by major SOs.

[2] The studies that use a similar measure of conventionality are discussed on pages 7 and 8.

[3] Earned income includes income from performances (ticket sales, broadcasting, and recordings, e.g.) and other earned income. Impresario activities and education projects are examples of other earned income.

2008a).[4] In addition, because annual performance deficits have increased, in general, increased levels of patron contributions are required (Flanagan 2008).

The degree of arts funding from different sources varies widely from country to country. In 1994, for example, per capita levels of direct public support for the arts ranged from $112, $90, $9, and $6 in Finland, Germany, Ireland, and the United States, respectively (Heilbrun and Gray 2001, p. 254). Western European governments provide more funding for SOs than government in the United States, generally. Schulze and Rose (1998) report that in Germany, government provides 80% of SO total revenues. In the United States, government contributed only 4% of direct SO funding in 2005 (League of American Orchestras 2008a).[5] Flanagan (2008), in a study of the 64 largest US SOs over a 17-year period, reports that support from all levels of government ranged between 1 and 25% of the total income. In addition, he reports a long-term decline in government support.

Private contributions to SOs are higher in the United States than in European countries, generally. Private philanthropic contributions to US orchestras by individuals, businesses, and foundations ranged between 6 and 60%, 5 and 53%, and 2 and 35%, respectively (Flanagan 2008, p. 56). For the 2005–2006 season, 39% of SO funding was provided by private contributors (corporations and individuals) (LAO 2008a). In European countries, private contributions are modest and provided by corporations, not individuals, generally. In the United Kingdom, for example, SOs received 10% of their funding from private sources in 1993 (Heilbrun and Gray 2001, p. 269). Also, in European countries, endowments and investments are much more important to symphonies than to other performing arts organizations (Heilbrun and Gray 2001, p. 29). Endowment funds provided 12% of SO funding for the 2005 season (LAO 2008a).

3 Symphony orchestra programming

One goal of SOs may be to create innovative programming, which would include contemporary pieces and other compositions that are rarely performed. However, evidence suggests that audiences prefer the standard repertoire. Baumol and Bowen (1966, p. 255) report that attendance decreased by 20% for adventurous orchestral programs performed in Britain's Royal Festival Hall in the early 1960s.[6] In addition, Baumol and Bowen (1966, p. 254) report that when a contemporary opera was performed at the Metropolitan Opera, attendance fell from the usual 97 to 89%. Therefore, SOs may avoid the risk of unfamiliar and challenging programming that may dampen ticket sales.

[4] The definitions of performance sources and concert income could change by context. Some examples of non-performance sources are as follows: an annual fund, endowment income, government funding, gift shop items, recordings, posters, food, beverage, and parking. Examples of concert income include ticket sales, sponsorships, program book ads, and concert fees.

[5] Because private contributions to nonprofit organizations such as SOs are tax deductible and arts institutions are exempt from local property tax in the United States, government contributes an additional amount, indirectly.

[6] Schulze and Rose (1998) find that public funding for German orchestras increases with population size and public budgets.

There is evidence that SOs have an affinity for a small number of composers from the classical and romantic periods, which are representative of the standard repertoire.[7] Mueller (1973) found that compositions of 28 composers, principally from the nineteenth century, accounted for over 50% of the concerts by 27 major US SOs. Between 1890 and 1970, the most often performed composers were Bach, Beethoven, Brahms, Tchaikovsky, and Wagner. Thuerauf (2008) reports a similar finding for SO programming for the 2003–2004 season. He finds that Beethoven and Mozart were performed regularly and that music from the classical and romantic period accounted for more than 90% of the concerts.

The League of American Orchestras (LAO) collects data on the compositions performed annually by a majority of US SOs (and several Canadian SOs) and includes the information in its' *Orchestra Repertoire Report*. In 2007, there were between 350 and 400 professional orchestras in the United States (LAO 2008a). The 237 SOs that reported performance information for the 2006 season performed 2,209 different compositions by 630 composers (LAO 2008b).

Although SOs can choose from thousands of compositions, a limited number of works receive the most attention. The compositions that were performed most often for each season between 2001 and 2008 are listed in Table 1. Thus, a repertoire heavily comprised of these compositions would indicate a high level of conformity in its programming. An examination of the group of composers that were most popular—capped by Beethoven, Mozart, Tchaikovsky, and Brahms—suggests that SOs continue to concentrate on a small group of composers from the classical and romantic period. In the 2006 season, 12.4 and 25.2% of all compositions and composers, respectively, were contemporary, and no contemporary composition was among the most often performed (LAO 2008b).[8] All compositions in Table 1 were composed before the twentieth century, and in the 2006 season, the most performed contemporary work was Joan Tower's *Made in America* which was performed 28 times.

In addition, no American composers were among the most often performed compositions listed in Table 1. Of the total performances during the 2006 season, 15.9 and 20.6% were US compositions and composers, respectively (LAO 2008b). Leonard Bernstein's Broadway musical *West Side Story* was performed 31 times, which was more than any other US composer's composition. Samuel Barber's *Violin Concerto* and Joan Tower's *Made in America,* which were performed 28 times, were the second most often performed compositions by an American composer.

3.1 Literature review

To the authors' knowledge, there are no studies that examine factors that affect US SO programming, although untested hypotheses exist. For example, William

[7] There are four broad, stylistic categories of classical compositions by which most compositions performed by SOs can be categorized as follows: baroque (from 1600 to 1750), classical (from 1750 to1830), romantic (from 1830 to 1910), and modern (from 1900 to present) (Grout 1973).

[8] This calculation is based on the LAO's definition of a composition composed within the last 25 years as contemporary. By this definition, some composers could have compositions that would be defined as contemporary and others that are not.

Table 1 The ten most frequently performed compositions by US symphony Orchestras in a single season (2001–2008)

Season	Composer	Year composed	Composition	Number of performances
2005–2006	Beethoven, Ludwig	1808	Symphony no. 6	89
2007–2008	Beethoven, Ludwig	1807	Symphony no. 5	83
2007–2008	Beethoven, Ludwig	1812	Symphony no. 7	77
2005–2006	Mozart, Wolfgang	1788	Symphony no. 41	76
2007–2008	Tchaikovsky, Piotr Ilyich	1888	Symphony no. 5	73
2005–2006	Tchaikovsky, Piotr Ilyich	1888	Symphony no. 5	73
2006–2007	Brahms, Johannes	1877	Symphony no. 2 in D Major, Op. 73	72
2004–2005	Dvorak, Antonin	1893	Symphony no. 9	71
2007–2008	Brahms, Johannes	1878	Concerto, violin, in D Major, Op. 77	71
2006–2007	Tchaikovsky, Piotr Ilyich	1893	Symphony no. 6 in B Minor, Op. 74	69

Source: League of American orchestras

Schuman, the American composer, suggests that SO management will kill innovative programming in return for revenue. Schuman hypothesized that an organization that is larger, more dependent on ticket revenues, or more dependent on voluntary contributions, will produce more "timid" programming (Schuman and Stevens 1979, p. 58). We will test such hypotheses by examining factors, including funding sources that influence SO programming in the United States.

A limited number of studies have examined factors that influence opera and theater company's programming. We consider those studies here because performing arts organizations faces similar programming dilemmas. Martorella (1975) found that the Metropolitan Opera and Lyric Opera of Chicago, which were more dependent on ticket sales, programmed more conservative operas than the New York City Opera, which received funding from the National Council of the Arts and the Ford Foundation. Pierce (2000) finds that for US opera companies, local government funding encourages program conventionality and federal government support encourages program risk-taking.[9] Heilbrun (2001) suggests that larger public subsidization of Canadian opera companies encourages them to perform more risky operas than US companies. In addition, anecdotal evidence indicates that audience preferences (and therefore ticket sales revenue) influence programming. Bruce Crawford, the general manager of the Metropolitan Opera, remarked that the Met concentrated on popular operas because neither the audience nor board members favored contemporary operas (Rockwell 1987).

Dimaggio and Stenberg (1985) find that theater companies with bigger budgets and halls perform more standard works. In addition, they find that increased competition (as evidenced in NYC) causes more innovative programming. O'Hagan

[9] Government provides an average of 6% of opera revenues (Pierce 2000, p. 46).

and Neligan (2005) find that higher subsidies, larger community population, and higher community incomes create more innovative programming, while larger theaters explain less risky programming. Neligan (2006) found that for German public theater, increased ticket revenues and venues increased conventionality, while increased subsidies, competition, and education increased experimentation. Werck et al. (2008) find that in Flemish theaters larger budgets may explain more innovative productions because they are more able to cope with the financial risk.

3.2 Evaluating the conformity of symphony orchestra programming

As discussed earlier, SOs consistently perform a small number of compositions a large percentage of the time. However, while SOs programming as a whole may be historically consistent, there is potential for variation between SOs. We examine the propensity of SOs to perform the "standard repertoire," regardless of the stylistic period to which the composition belongs. We define the standard repertoire as one that is comprised by the most performed compositions in our sample, without regard to origin or time period. We construct an objective measure of the degree to which SOs perform the standard repertoire, in order to determine whether an orchestra's programming is more or less innovative. We define this value as the standard repertoire index (SRI) measure, which is calculated in a way similar to the conformity index developed by DiMaggio and Stenberg (1985). A SO's SRI is a measure of the average number of times a work performed by one SO is performed by all SOs.[10] For example, a value of 1 indicates that no other orchestra performed the work, and a value of 8 indicates that, on average, seven other orchestras performed the composition. Thus, the SO, not the composition performed, is the unit of analysis. A higher SRI indicates that a SO plays more standard repertoire.

Eighty-four American and three Canadian SOs from the top four groups provided repertoire information to the LAO. Table 2 lists the SRI ranking for the 87 SOs by group for the 2006–2007 season. We estimate an SRI value for all SOs in group 1 through group 4; the LAO categorizes SOs by budget size and artistic expense. Budgets for group 1 SOs are greater than $12 million, and budgets for all SOs in this sample are at least $1.5 million. Although the LAO repertoire file includes compositions performed by 237 SOs, we use performances by only the largest SOs because smaller community SOs may not be representative of SO programming.[11] In addition, smaller SOs do not report complete financial data, which will be required for regression analysis.

For group 1 SOs, the Utah Symphony, which had a 4.0 SRI, performed the fewest standard repertoire compositions and the Toronto Symphony, with a 9.0 SRI, the

[10] We count each time a work was performed, so if the orchestra gives three performances of Brahms 1st Symphony over a weekend series, e.g., this counts as three times. The final SRI value is the mean of the values of the individual compositions SRI. Two major SOs—the New York Philharmonic and the Dallas Symphony—did not report repertoire and are not included in this study. Counting each time that a work is performed may bias the index if a SO repeats a composition numerous times.

[11] The small community orchestras (the Columbia Orchestra in Eliot City, MD, e.g.) we refer to here may perform four concerts a year and are comprised of amateur musicians very often. The challenge to the orchestra and the audience of non-standard repertoire preclude the likelihood that the orchestra would perform anything but standard works.

Table 2 Standard repertoire index

Group 1	
Utah Symphony	4.0
Nashville Symphony	4.3
San Francisco Symphony	4.3
Minnesota Orchestra	4.4
Detroit Symphony Orchestra	4.4
National Symphony Orchestra	4.4
Oregon Symphony	4.4
Philadelphia Orchestra	4.8
Chicago Symphony Orchestra	4.8
Saint Louis Symphony Orchestra	4.9
Atlanta symphony Orchestra	4.9
Seattle Symphony	5.0
Boston Symphony Orchestra	5.1
Baltimore Symphony Orchestra	5.1
New Jersey Symphony Orchestra	5.5
Houston Symphony	5.6
Cleveland Orchestra	5.7
Los Angeles Philharmonic	5.8
Milwaukee Symphony Orchestra	7.1
Cincinnati Symphony Orchestra	7.1
Indianapolis Symphony Orchestra	7.2
Pittsburgh Symphony	7.4
National Arts Centre Orchestra	8.4
Saint Paul Chamber Orchestra	8.4
Toronto Symphony Orchestra	9.0
Group 2	
Los Angeles Chamber Orchestra	2.6
Naples Philharmonic	3.8
Phoenix Symphony	4.1
Pacific Symphony	4.8
Florida Orchestra	5.0
Honolulu Symphony Orchestra	5.0
Kansas City Symphony	5.2
Jacksonville Symphony Orchestra	5.7
Edmonton Symphony Orchestra	5.7
Fort Worth Symphony Orchestra	6.4
Syracuse Symphony Orchestra	6.8
Grand Rapids Symphony	6.8
Buffalo Philharmonic Orchestra	7.3
Winnipeg Symphony Orchestra	7.8
Rochester Philharmonic Orchestra	8.9
Colorado Symphony Orchestra	9.4

Table 2 continued

Toledo Symphony	10.3
North Carolina Symphony	11.1
Charlotte Symphony	11.2
Louisville Orchestra	12.5
Group 3	
Santa Rosa Symphony	3.7
Chamber Orchestra of Philadelphia	4.4
Florida West Coast Symphony Orchestra	4.5
American Symphony Orchestra	5.3
New Mexico Symphony Orchestra	6.3
Elgin Symphony	6.9
Fort Wayne Philharmonic Orchestra	7.1
Hartford Symphony Orchestra	7.5
Spokane Symphony Orchestra	7.7
Austin Symphony Orchestra	8.1
Dayton Philharmonic	8.2
Long Beach Symphony Orchestra	8.3
Chattanooga Symphony	8.8
Arkansas Symphony Orchestra	8.8
Memphis Symphony Orchestra	9.3
West Virginia Symphony Orchestra	10.0
Tucson Symphony Orchestra	10.3
Charleston Symphony Orchestra	13.0
Orlando Philharmonic Orchestra	15.7
Rhode Island Philharmonic	17.0
Portland Symphony Orchestra	17.6
Oklahoma City Philharmonic	18.6
Group 4	
Chicago sinfonietta	3.3
Quad City Symphony Orchestra	3.4
Monterey Symphony	4.1
New West Symphony Orchestra	4.5
Santa Barbara Symphony Orchestra	5.0
Delaware Symphony Orchestra	5.2
Napa Valley Symphony	5.7
Symphony Silicon Valley	5.9
Des Moines Symphony	7.1
Harrisburg Symphony Association	7.5
Greenville Symphony Orchestra	8.7
Wichita Symphony Orchestra	9.2
Mississippi Symphony Orchestra	9.3
Evansville Symphony	9.8
Baton Rouge Symphony	10.0

Table 2 continued

Pasadena Symphony Association	10.2
Cedar Rapids Symphony Orchestra	11.3
New Haven Symphony Orchestra	11.7
Shreveport Symphony Orchestra	11.9
Youngstown Symphony Orchestra	18.9

greatest number of standard works. Of the sample, the Los Angeles Chamber Orchestra has the lowest SRI (2.6), which would be expected because, generally, a chamber orchestra (which is smaller than a SO) would not perform many of the compositions that SOs would perform. However, of the other two chamber orchestras included in this analysis, one—the Chamber Orchestra of Philadelphia—has a low SRI (4.4), and the other—the St. Paul Chamber Orchestra—has a relatively high SRI of 8.4. An examination of the season performances by the St. Paul Orchestra explains this unexpected ranking. For the 2006 season, the chamber group played a large number of compositions by Beethoven, including all nine symphonies. Compositions by Beethoven are a large part of the standard repertoire. Group 4's Youngstown Symphony's SRI of 18.9 is the highest SRI of the sample.

Table 3 shows the SRI mean and standard deviation for each group. For the total sample, the average SRI is 7.2; the minimum and maximum values are 2.6 and 18.9, respectively. Group 1 SOs have the lowest average SRI score (5.7), which suggests that in general, major orchestras are more likely to stray from the standard repertoire. Major SOs that would have more resources would be expected to perform more nonconventional works, which may more challenging. In addition, audiences in larger cities may be more open to some experimentation. The low standard deviation for group 1 SOs (1.5) may indicate that major SOs have a similar propensity to perform standard repertoire.[12]

Although the SRI is a useful measure of the degree to which a SO will perform standard work relative to other SOs, it is not a measure of the degree to which a SO champions "American" music. We calculate the percentage of American compositions performed by the SOs in this sample. On average, 14.6% of the compositions performed by the SOs in our sample were by American composers. Group 1 SOs performed the fewest American compositions (13.5%), and group 4 SOs performed the most (27.1%).[13]

4 Determinants of SO programming

4.1 Symphony orchestra funding sources

The goal of this study is to determine what effect, if any, the source of a SO's revenue has on programming. However, the programming process can be complex,

[12] A reviewer notes that the low standard deviation may be the result of the larger number of performances of Group 1 orchestras giving a less-biased estimate of the value.

[13] We calculate the percentage of contemporary compositions performed by the SOs in this sample in order to examine which SOs are more likely to perform modern compositions.

Table 3 Sample statistics of standard repertoire index by group

	N	Mean	SD	Minimum	Maximum
Group 1	25	5.7	1.5	4.0	9.0
Group 2	20	7.0	2.8	2.6	12.5
Group 3	22	9.4	4.3	4.4	18.6
Group 4	20	8.1	3.8	3.3	18.9
Total	87	7.2	3.5		

and management's motivations may be conflicting. Determining program choices is not the sole purview of the music director, generally. Indeed, oftentimes the music director conducts less than 50% of the concerts for the SO for which he or she is the principle conductor. Others, such as the artistic administrator, executive director, or guest conductor, also have influence on programming, especially in major orchestras. In addition, while management may be motivated to choose nonstandard music in order to advance the art, program choices may be influenced by the necessity to generate revenue. Certainly, one objective of programming, therefore, is to generate revenue by increasing attendance. Hence, program choices may be biased toward more well-known and popular compositions. In addition, the preferences of individuals and institutions that contribute funds could affect programming. SO management, for example, may choose programming that is perceived to be more appealing to a donor. Therefore, the objective of programming innovative compositions may conflict with the necessity of generating revenue.

As discussed earlier, funds from performances, endowments, governments, private groups, and individuals contribute to SO income. Government funding can be provided at the local, state, and federal level (which would include funding from the National Endowment for the Arts); individuals, corporations, and foundations comprise the private funding category.

In order to examine the effect of funding and other factors on SO programming, we collect data on 64 SOs for the 2006–2007 season. We exclude from the analysis several SOs ranked in the SRI Table because they did not provide sufficient financial data to the LAO.[14] Table 4 lists the percentages of funding by group for the 64 SOs. Government, other earned income, endowments, performance receipts, and private contributions provide an average of 4.1, 4.4, 18.2, 28.7, and 44.6%, respectively, of SO funding. Government funding and private contributions are the smallest and largest, respectively, average funding categories. Of government funding, the federal government provided the smallest proportion. The percentage of total government funding provided by local, state, and federal government is an average of 40.4, 48.2, and 11.4%, respectively.

Group 1 SOs are more reliant on endowment funding and less reliant on performance and private funding than other SO groups. Group 1 SOs receive 26% of funding from endowment, which is 43% higher than the average. Group 1 SOs

[14] The LAO provided the SO financial data and other specific variables for this study.

Table 4 Funding source by category (by symphony orchestra group)

	Percentage Performance	Percentage Other earned	Percentage Government	Percentage Private	Percentage Endowment
Group 1	22.5	7.0	4.9	39.7	26.0
Group 2	31.9	1.6	5.6	50.2	10.7
Group 3	32.7	3.6	2.7	44.9	16.1
Group 4	30.3	4.4	2.2	46.2	16.8
Average	28.7	4.4	4.1	44.6	18.2

Source: League of American orchestras, authors' calculations

receive only 22.5% funding from performance, which is 22% less than average.[15] Group 1 SOs receive the smallest percentage of private funding, which is 11% less than the average amount of the total sample.

4.2 The conductor standard repertoire index

Although several members of SO management may help determine programming, and numerous factors affect the process, some conductors may have a great deal of control over what music will be programmed. In order to examine the influence of a conductor on programming decisions, we create an objective variable, calculated in a way similar to the SRI described earlier, that defines a conductor's degree of nonconventionality. The LAO lists the conductors that lead performances for the SOs. The conductor standard repertoire index (CSRI) measures the degree to which a conductor performs more standard works, as determined by the concerts conducted in the 2006–2007 season. We use only those conductors of works performed by the 64 SOs in the sample that provided the SRI calculation.[16] We "count" each combined concert performance by a conductor; i.e., if a conductor performs Beethoven's 9th Symphony three times over a weekend concert series, this is counted as a single performance.

Several SOs did not have a designated conductor for the 2006 season and were not included in the regression. Fifty-six principle conductors and one artistic advisor were matched to a SO.[17] The CSRI value by group is similar, except for group 4 which has a much higher value than the average (Table 5). However, the small number of orchestras in this category (6) may bias the value. The average CSRI is 5.6 with a standard deviation of 2.2. Of the major SOs, Slatkin (3.54) with the National Symphony and Jarvi (7.88), the conductor of the Cincinnati Symphony, had the lowest and highest CSRI, respectively. In the total sample, Diemecke with

[15] Performance funds include concert revenues as well as revenue from broadcasts and recordings, which generate revenue for major SOs only, generally.

[16] The total number of conductors for this calculation was 274.

[17] We matched Leonard Slatkin with the Nashville Symphony where he was artistic advisor. Often, a SO will be without a designated conductor when it is in the process of hiring a new conductor. The SO will audition conductors during the season.

Table 5 Sample statistics of conductor standard repertoire index

	N	Mean	SD	Minimum	Maximum
Group 1	18	5.7	1.6	3.54	7.88
Group 2	15	5.6	1.1	3.69	8.13
Group 3	14	5.3	1.9	2.22	9.05
Group 4	6	7.3	4.9	2.52	15.97
Total	57	5.7	2.2		

the Long Beach Symphony Orchestra has the lowest CSRI (2.22) and Malina with the Harrisburg Symphony has the highest (15.97).

4.3 The model

Factors that may affect SO programming are described in Table 6 and examined as arguments in the following regression model:

$$\mathrm{SRI}_i = f\big(\mathrm{CSRI}_i, \mathrm{NumSub}_i, \mathrm{Filled}_i, \mathrm{Perform}_i, \mathrm{Endow}_i, \mathrm{Lgov}_i, \mathrm{Sgov}_i, \mathrm{Fgov}_i, \mathrm{Bus}_i, \mathrm{Foun}_i, \mathrm{Priv}_i, \mathrm{Qual}_i, \mathrm{Inc}_i, \mathrm{PCon}_i\big)$$

where the dependent variable is the SRI for the *i*th SO, and the independent variables include factors that SO management can control as well as variables that define the SO's location.

Clearly, SO management considers ticket buyer preferences when determining programming. The more an SO depends on ticket revenue as a source of funding,

Table 6 Variable symbol and definition

SRI	SO standard repertoire index
CSRI	Conductor standard repertoire index for SOs principle conductor
NumSub	Number of subscription concerts
Filled	Percentage of hall filled
Perform	Total revenues from concert performances per capita
Endow	Percentage of total revenues from endowment
LGov	Percentage of total revenues from local government
SGov	Percentage of total revenues from state government
FGov	Percentage of funding from federal government
Bus	Percentage of funding from business contributions
Foun	Percentage of funding from foundations
Priv	Percentage of private contributions
Qual	SO quality
Inc	Median family income of SO's metropolitan area
PCon	Percentage of pops concerts

Sources: League of American orchestras, City-Data.com

the more likely it will perform compositions that appeal to ticket buyers. Thus, we examine how the share of revenue from ticket buyers (Perform) affects the SRI. Conversely, if a SO receives a larger percentage of funding from endowments (Endow), it may enjoy greater independency and therefore have a lower SRI.

Funding by local, state, or federal government may affect programming differently. Increased levels of federal government funding (FGov) may create more risk-taking by SOs because the federal government provided a more stable source of funding in the study period, or it was less intrusive in dictating programming. However, some grants are conditional and require specific actions by SOs. NEA funding, for example, may require the programming of "new work", which would create a lower SRI for the SO. Less experimentation may result from local government funding (LGov) if local representatives prefer the safety of a more conventional repertoire. Also local politicians may be more likely to fund a SO if their constituents (the voters) view the performance more favorably, which would suggest that a SO would perform more popular repertoire. As discussed earlier, Pierce (2000) found these results from local and federal funding of US opera companies. A priori, we have no expectation of whether state funding (SGov) will encourage or discourage unconventional programming.

SO management may also program compositions that are perceived to be more appealing to private donors. If private contributions (which are received from individuals, businesses, and foundations,) are a relatively large percentage of funding, then the SRI may be higher for various reasons. First, individual donors (Priv) dislike innovative music, motivating SOs to perform conventional repertoire. Secondly, sponsorship by corporations (Bus), which may exhibit conservative tastes, may prefer more favorable audience reactions and thus, may increase the likelihood of more standard repertoire performances. Finally, private, local foundations (Foun) may be risk-averse, thus preferring the standard repertoire (Dimaggio 1986, p. 136).

We also explain the SRI based on several characteristics that define SOs. First, the CSRI (defined earlier) is included to reflect the impact of the principal conductors on repertoire. We expect that music directors with low CSRI values tend to lower the SRI. Several of the variables are likely to be correlated because they correspond to the size of the SO. We define SO quality (Qual) as the average wage per musician because SOs paying larger salaries to artistic personnel would be expected to provide a higher level of performance, on average.[18] A high-quality SO may be more likely to perform unfamiliar works, so that the SRI would be lower. The number of subscription concerts (NumSub) may affect the SRI. SOs that perform more concerts may have a lower SRI because they would have greater flexibility and are able to experiment more.

We include a variable for the percentage of total concerts that are "pops" concerts (PCon), although "pops" compositions are not included in the repertoire list. If a SO performs a larger percentage of "pops", this may be an indication of a tendency to perform more standard repertoire, which would create a higher SRI. We

[18] Payroll is adjusted for the cost of living in the SO's metropolitan area.

Table 7 Descriptive statistics

Variable	Mean	SD	Minimum	Maximum
SRI	7.05	2.94	3.40	17.55
CSRI	5.06	2.82	.00	15.97
NumSub	38.37	28.69	6.00	116.00
Filled	.67	.15	.35	1.09
Perform	.29	.09	.14	.51
Endow	.18	.12	.007	.49
LGov	.02	.03	.00	.14
SGov	.02	.04	.00	.20
FGov	.002	.01	.00	.58
Bus	.07	.04	.005	.15
Foun	.06	.07	.00	.38
Priv	15.39	37.70	.59	296.21
Qual	194.14	191.66	15.91	883.80
Inc	43,593.26	11,407.50	27,654.00	78,400.00
PCon	.28	.18	.00	.63

examine the percentage of the hall that is filled (Filled), which we expect to have a similar effect. However, we do not use the two variables in the same equation.

Factors that define each SO's community that may influence the degree of program conventionality include education, median age, population size, unemployment rate, and income. Heilbrun and Gray (2001, p. 50) find that populations with higher incomes increase attendance. Therefore, we expect higher incomes (Inc) to allow greater experimentation and thus create a lower SRI. Table 7 provides descriptive statistics of the variables included in the regressions.

5 Empirical results

We used ordinary least squares to estimate the model; results are listed in Table 8. A Box–Cox transformation was used to determine that the semilog specification is preferable to the linear. We correct standard error estimates for heteroskedasticity with the method developed by White and use the Variance Inflation Factor to test for multicollinearity.[19] Some variables that were not significant were dropped in order to reduce multicollinearity. For the sample, higher unemployment levels are negatively correlated with business contributions, although unemployment is not

[19] We examined several other variables that were not included in the final regressions. Although several variables were insignificant, multicollinearity may be responsible. Unemployment, education, budget, size of the hall, and attendance were deleted due to their insignificance. Attendance, advertising, budget, quality, number of subscriptions, the percentage of ticket revenue, and percentage of total performance were all correlated with group 1 SOs, although hall was not. We used revenue from ticket sales but not broadcasting and recording performances, which few nonmajor SOs receive. SO quality and budget size were correlated. Variables which were tested but not included because they were insignificant were population and the age of the orchestra.

Table 8 Estimation results of model for symphony orchestra SRI

	(1)	(2)
Constant	2.250	2.557
	(.301)	(.344)
CSRI	–	−.009
		(.013)
NumSub	−.0043	−.004
	(.0027)	(.003)
Filled**	.737	.567
	(.315)	(.330)
Perform*	−.002	−.002
	(.0008)	(.0009)
Endow**	−.994	−1.197
	(.397)	(.395)
LGov*	−2.208	−2.379
	(.960)	(.922)
SGov	.781	.697
	(1.300)	(1.580)
FGov	−3.937	−4.217
	(3.458)	(3.451)
Bus	−.988	−.921
	(1.188)	(1.197)
Foun	−.256	−.089
	(.475)	(.465)
Priv	−.079	−.177
	(.375)	(.362)
Qual	.0001	.0003
	(.0003)	(.0003)
Inc*	−.00001	−.00002
	(.000004)	(.000004)
PCon**	.586	.570
	(.262)	(.260)
Adj. R^2	.42	.45
	$n = 62$	$n = 56$

Standard errors are in parentheses

* Statistical significance at 99% level

** Statistical significance at 90% level

correlated with private and foundation contributions.[20] We include income but not education in the regression because the two variables were strongly correlated. Concert revenue and total performance revenue are closely correlated, so we tested each separately. As in previous studies which have found simultaneity to not be a problem, we use a single equation.[21]

[20] Flanagan (2008, p. 57) finds that private contributions increase in locations with higher populations and incomes, although higher unemployment rates have no effect.

[21] O'Hagan and Nelligan (2005), who tested for simultaneity, and Nelligan (2006) as well as others have not found simultaneity to be a problem.

Two separate equations are listed in Table 8. We dropped two outliers—the Los Angeles Chamber Orchestra and the Oklahoma Symphony. As discussed earlier, a chamber orchestra performs compositions that differ from a SO, generally. Oklahoma has a much higher endowment and SRI than the average SO in its group. In regression (1), we use the remaining 62 SOs, and in regression (2), which includes the CSRI, 55 SOs were matched with a music director. The R^2 in (1) is .42, and several variables are significant, which allows us to draw several inferences. Dropping the two outliers improved the R^2 by 13%.

Several funding sources are significant determinants of programming. A larger percentage of revenues from ticket sales, endowments, and local government affected programming significantly and lowered the SRI. We expect such funding creates more security or autonomy for the SO and therefore encourages more innovative programming. Although it might be expected that being more dependent on ticket sales would lead to a more conventional programming choice, a large percentage of revenue from ticket sales may represent a strong audience base, which allows more experimentation. The results suggest that local government funds do not require SOs to perform more popular works. Although this is contrary to *a priori* expectations, this could be interpreted as a proxy for local public support, which may encourage more experimentation.

Revenue from other funding sources did not affect programming. Funding from government at the state and federal level did not impact programming although federal funding is the expected sign. This may be because government funding contributes little to most SOs. In a separate regression, we replaced the percentage of federal funding with the percentage of NEA funding, but the results did not change significantly. We also combined all government fundings; however, the percentage of total government funding was not significant. Contributions from private sources did not impact programming, although the sign for each was negative.

Several other factors of interest are significant. As expected, higher incomes are associated with a lower SRI. This confirmed our expectation that, holding all else constant, SOs in more affluent areas may face demand for more unique works. The SRI is higher if a larger percentage of total concerts are pops concerts, which suggests that these SOs are more conservative programmers. When the "pops" variable is eliminated, the R^2 is 11% lower, suggesting that this variable is an important factor. If a larger percentage of the SO's hall is filled, the SRI is higher. This positive correlation between attendance and more conventional repertoires was not expected.

The results are similar for regressions (1) and (2), although the R^2 increases to .45 in the latter. The CSRI is not significant, indicating that, in general, conductors have little influence on the degree to which SOs vary from the standard repertoire. The low Pearson correlation coefficient between the SRI and the CSRI (−.0553) reinforces this conclusion. The low correlation coefficient between CSRI and SRI for group 1 SOs which is −.0056 indicates no relationship between conductor and the SOs propensity to perform standard repertoire. Although the correlation coefficient is larger for groups 2 (.0241), 3 (−.2017), and 4 (.2998), there is no indication of a relationship between the two variables for any group. There may be a

lack of a relationship between programming and music director, in part, because SOs tend as a group to perform consistent repertoires, and a music director cannot alter this general predilection. In addition, the insignificant correlation may be due to the complex nature of program determination that was discussed earlier.

6 Conclusion

The preferences of patrons and audiences influence musicians' programming choices today, as in the past. In this initial study of SO programming, we quantified the degree to which SOs innovate and examined the factors that cause SO programming to be more or less conventional. We find that as a group, major SOs are more likely than nonmajor SOs to perform nonstandard repertoire, although there is significant variation between organizations. We find that funding sources are important determinants of SO programming. Increased levels of funding from ticket sales, endowment, and local government encourage innovative programming. In addition, the results suggest that a symphony orchestra's conductor does not have a significant impact on the degree of program conventionality.

A limitation of the current study is that the single season of data used in the analysis may be biased by circumstances. A particular season's programming could be biased toward the standard repertoire if, for example, the SO was between music directors, as was the case for the Pittsburgh Symphony Orchestra in 2006. With many guest conductors in 2006, it is likely that standard repertoire would be more represented because a guest conductor, who does not have the luxury of conducting numerous concerts, may seek approval by performing compositions that are more popular. Therefore, examining additional seasons would be an important extension of the current study. In addition, if more than one year is included in a database, this will allow the examination of only the largest SOs, which may provide a more accurate indication of factors influencing the major SOs.

If SO performance deficits continue to increase without increased government and private contributions, SOs will become increasingly dependent on ticket sales. Given the current economic downturn, which is causing decreased endowments, private contributions, and ticket sales, programming may be moving toward greater conventionality, as SOs attempt to maintain the audience base. An argument that is made for increased public funding for SOs is that more public support encourages innovative programming, which is important to advance classical music (Heilbrun and Gray 2001, p. 229). Increasing government funding may encourage experimentation by orchestras and offset the concern that audiences are hostile toward "new" music. Although we found that only local government funding had significant positive impact on nonstandard programming, the 2006–2007 level of federal and state government funding may have been too small to have a significant impact. In addition, although not tested in this model, increased emphasis on music education may increase an appreciation of classical music and lead to more innovative programming.

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