

Article

Analysis of Dance Data Company Endowments, Assets, and Labor in the United States

Rose Evard¹ , Ruth Button¹, Zhen Nie¹ , Quinn White¹ 

¹ Smith College Statistical & Data Sciences Department 1 Chapin Way, Northampton, MA, 01063;
 * Correspondence: andrew.hoekstra@dancedataproject.com

Version April 27, 2023 submitted to Journal Not Specified



Abstract: To understand how we can advance equity in dance, it is crucial to understand existing financial structures and incentives that shape these companies' success. Assessment of publicly available tax documents on dance companies over the past decade can provide important insights into how different companies fared financially over this time period. Additionally, this work can provide an important basis of understanding for future analyses on the impact of the pandemic on existing trends on the financial performance. By analyzing publicly available Form 990 documents on 169 dance companies across the United States, we present information on companies' endowments, investments, compensation of employees, and sources of labor. In the process, we also bring light to issues of data quality to consider when analyzing Form 990 documents.

Keywords: Endowment; Non-Profit; Volunteer Labor; Dance.

1. Introduction

1.1. Scope

As a matter of transparency and public accountability, tax documents filed by nonprofit corporations in the United States have always theoretically been available to the public, but it wasn't until the development of electronic tax filing systems through the IRS that these tax documents became easily accessible for analysis. Online tax filing systems have been available since the late 1990's, but the 2019 Taxpayer First Act required all nonprofits to electronically file their tax returns (Ely et al., 2023). This legislation changed the landscape for public accessibility of the financial information of nonprofits as well as presented novel research opportunities for data activism. Incorrect reporting, inequitable wealth distribution, and tax fraud by nonprofit organizations has always happened, but mandatory online reporting allows data analysts to identify suspected cases and draw attention to them (Ely et al., 2023).

1.2. Inequality in the Arts

The study of women and gender has consistently drawn focus to inequitable distribution of wealth between men and women. One of the most heavily researched phenomena regarding wealth inequality is the wage gap between men and women that persists even when they have the same education, experience, skills, and job titles (Jikar, 2022). Contrary to the popular opinion that the gender wage gap is narrowing, Weichselbaumer & Winter-Ebmer (2005) showed that financial returns in relation to skills and education are increasingly higher for men than for women. Even less research has been done on the wage gap for transgender or non-binary individuals. Additionally, compounding factors such as lack of corporate oversight and socially-imposed gender roles further entrench the gender pay gap into everyday life (Pub, 2013). Further understanding the wage gap in female-dominated fields,

such as in dance, can inform future solutions to lessen the inequitable distribution of wealth between men and women.

The wage gap has long been exacerbated by disproportionate pay in the arts, and especially dance, in part because the vast majority of entry-level dancers are women and girls (Jikar, 2022). Additionally, unpaid labor in dance is much more commonplace than in other industries (Pub, 2013). Because dance is a performing art, many companies that employ dancers are entitled to government subsidies and tax breaks; however, there are no current regulations to ensure that this governmental assistance is used to lessen unpaid and underpaid labor by dancers (Fuchs, 2021). Unrestricted financial assistance may worsen existing inequalities in the field of dance by enabling company owners and executives to profit while retaining unpaid and underpaid labor, so further understanding how this assistance is used is essential in combating the problem.

1.3. Dance and Tax Returns

In the United States, nonprofit organizations file either a Form 900 or a Form 990 EZ with the IRS each year. These documents include, but are not limited to, information on the organization's geographic location, number of employees and volunteers, operating costs, income, compensation, and net assets. This information is more accessible than ever now that the government has required nonprofit organizations to electronically file them. Yet, much of the public does not understand the terms on publicly available tax forms nor does the average person possess the skills to readily analyze hundreds of tax forms every year (Lamontagne, 2023). Thus, data scientists can play a very important role in analyzing these forms filed by dance companies and presenting findings to the public. Further elucidating the financial practices of nonprofit organizations 1) in the field of dance, 2) in pandemic-related economic shifts and 3) through geographical analysis can help inform proper solutions to a wide range of issues, including the gender pay gap in dance.

1.4. The Dance Data Project

We completed this project in collaboration with our project sponsor, the Dance Data Project (also known as the DDP). The Dance Data Project is a non-profit organization dedicated to equality in the arts. Founded in 2015 by former ballet dancer and philanthropist Elizabeth Yntema, the DDP uses data and research to promote transparency, accountability, and action towards gender equality in dance.

The DDP collects, analyzes, and presents data to outline lack of leadership opportunities for female directors, choreographers, composers, set, costume, lighting designers, and back-of-house positions in dance. The organization seeks to create a world where all dancers, regardless of gender, race, ethnicity, or socioeconomic status, have equal access to opportunities and resources in the dance world. The organization also advocates for removing barriers for female employment and advancement in this industry, such as lack of parental and elder leave, day care system, and protocol for sexual harassment by presenting their findings on television news such as MSNBC and publishing articles in magazines such as *Vogue* and *People*. Through its data-driven research, advocacy, and education efforts, the DDP works to create a more equitable and inclusive dance community where all individuals have the opportunity to pursue their passion for dance.

1.5. Scope

This project will be a preliminary analysis of publicly available financial information on dance companies in the United States. Results will be collected for and shared with Dance Data Project for any publications or future analyses that they perform. Because little analysis has been done on financial practices of dance companies in the United States, our exploratory approach will examine broad research areas regarding how dance companies manage endowments, employment, and properties.

The bulk of our report consists of examining how companies' financial resources (particularly endowments) behave over time, in comparison to one another, and in comparison to the S&P 500.

79 We also look into the use of volunteer labor alongside the use of paid employment labor and how
80 geographical location impacts the use of each type of labor.

81 The data source for this project is a collection of IRS Form 990's and IRS Form 990 EZ's from dance
82 companies in the United States. These publicly available tax documents are required annual filings
83 for nonprofits¹ and include information including each the number of employees and volunteers,
84 compensation to employees, geographical location, and annual revenue. We primarily present analysis
85 based on Schedule D of the Form 990. Only companies meeting certain criteria regarding the possession
86 of certain funds and assets must file Schedule D, which contains data on endowment funds as well as
87 building values and other assets. Our analysis seeks to capture trends in how these companies have
88 managed their assets and endowments, primarily in the time span of 2014 to 2020, with the goal of
89 bringing transparency to the financial side of the dance industry.

90 **2. Ethics Statement**

91 This project included signing a non-disclosure agreement with Dance Data Project in which each
92 group member agreed to keep specific collections of data produced by DDP confidential. Still, data that
93 was collected during our analyses was not covered by the NDA but was still sensitive. The potential
94 impact of this information getting into the wrong hands would be harmful to the Dance Data Project
95 and their ability to publish the findings. Certain information could be used by dance companies to
96 silence the DDP's message or competitors could publish and get recognition for DDP's proprietary
97 information. Therefore, each team member was especially careful not to disclose any information that
98 may harm DDP's work to third parties.

99 We also assumed that data reported on the IRS 990, 990EZ, and Schedule D forms was accurate
100 unless identifiable discrepancies were found or amendments were reported. The social harm that could
101 occur from this assumption is dance companies who accidentally misreport on their tax documents
102 may be identified in our analyses as violating ethical or financial norms. In order to prevent this, our
103 team and DDP collaborated to reach out to companies to ask for clarification of our findings before
104 potentially publishing their name.

105 Finally, all of us have training in data science, but we are not dancers. Because none of us have
106 lived experience in dance, we cannot provide personal expertise in analyzing this data. Additionally,
107 our group all identifies as female and none of us are Black. The standpoints of dancers, men, and
108 people of diverse backgrounds in data analyses may offer a more comprehensive understanding of
109 the context behind our dataset. In order to reduce our bias (although it was not possible to change
110 our social identities), we spoke with our project sponsors about how to approach this data that may
111 impact other social groups.

112 **3. Detailed Methodology**

113 *3.1. Data Acquisition*

114 Data files were gathered by Andrew Hoekstra, data consultant from DDP, prior to February
115 8th, 2022 from publicly available IRS APIs. Form 990s were downloaded as XMLs. Our sample
116 contained 169 US dance companies in total, with Form 990s submitted between 2015 and 2022, thus
117 representing fiscal years 2014 through 2021. For Schedule D in particular, companies are required to
118 report endowment totals up to 4 fiscal years prior, thus our endowment data spans 2010 to 2021.

1 Most major dance companies are nonprofits.

¹¹⁹ *3.2. Initial Wrangling & Filtering*

¹²⁰ Form 990 can be completed in three different formats: Form 990, Form 900-EZ, and Form 990-T.
¹²¹ We excluded all Form 990-Ts because these forms do not contain relevant information on variables
¹²² considered in our analyses. Additionally, when a company amended a filing, and hence had multiple
¹²³ filings corresponding to a single fiscal year, we took the amended filing.

¹²⁴ *3.3. Company Communication*

¹²⁵ Because companies report data across years, a useful data quality check can be if the year they
¹²⁶ reported for the previous years in a filing correspond to the values they actually reported in those
¹²⁷ years.

¹²⁸ For example, when a company reports in their 2020 filing the beginning of year endowment
¹²⁹ balance for years 2016 through 2020, we can check whether the value they reported for 2016 in 2020 was
¹³⁰ indeed what they reported in 2016. Reporting was highly consistent across the companies considered;
¹³¹ however, there were some notable discrepancies, particularly in earlier years. When we identified
¹³² these discrepancies, we reached out to the companies to clarify which values were correct. We received
¹³³ prompt responses from BalletMet and Pittsburgh Ballet, who confirmed the more recently reported
¹³⁴ values were correct.

¹³⁵ Because discrepancies were typically in earlier years, and our communications with the companies
¹³⁶ who did respond noted their most recently reported values were correct, in our analyses we took the
¹³⁷ most recent data available. For example, we took values for 2016-2020 from the 2020 filing instead of
¹³⁸ taking the current year values for the filing from each year separately.

¹³⁹ Another result of this approach is that we can look back through 2010 in some cases, since
¹⁴⁰ although we only have filings that go back to 2014, each filing has data going back four years.

¹⁴¹ *3.4. Standard Definitions*

Term	Definition
Endowment	The form 990 uses the definition of the endowment (and types of endowments) from the Financial Accounting Standards Board , which defines an endowment fund as “An established fund of cash, securities, or other assets to provide income for the maintenance of a not-for-profit entity (NFP). The use of the assets of the fund may be with or without donor-imposed restrictions.”
Rank	
Percent Change	The percent change is $\frac{\text{End Value} - \text{Beginning Value}}{\text{Beginning Value}} \times 100$.
S&P 500	The Standard and Poor's 500 Index is a standard index used as a benchmark to describe the behavior of the stock market overall. The index includes 500 top publicly traded companies and is weighted by the market value of stocks currently held by stakeholders, where companies with higher market value receive higher weight.
Compound Annual Growth Rate	The compound growth rate (CAGR) describes a company's average growth over multiple years. It is useful as a smoothed metric to look over growth over a set of years and compare companies in the same time period. For a time period of t years, we compute the annual growth rate as
	$\text{Compound Annual Growth Rate} = \left(\frac{\text{End Value}}{\text{Beginning Value}} \right)^{\frac{1}{\text{End Year} - \text{Beginning Year}}} - 1$

Table 2. Organizations with 100% of their Endowments in One Category for All Years on File

Organization Name	Number of Years on File
Board designated or quasi-endowment	
The Tallahassee Ballet	6
Ballet Quad Cities	2
Canyon Concert Ballet	1
Permanent endowment	
Pittsburgh Ballet Theatre	7
Dance Theatre of Harlem, Madison Ballet	6
BalletMet	5
Aspen Santa Fe Ballet, Ballet West	4
New Mexico Ballet Company	3
Oregon Ballet Theatre	2
American Repertory Ballet, Colorado Ballet, Orlando Ballet	1
Temporarily restricted endowment	
First State Ballet Theatre	6
Ballet Des Moines	2

142 4. Findings

143 4.1. Endowments

144 **Endowments** are donated funds to nonprofit organizations which are invested. Endowments are
 145 typically designed to maintain initial donations (principal funds); the investment income produced by
 146 the invested donation can be utilized for specific purposes. Depending on endowment management
 147 and policies, some organizations can remove a certain amount of principal assets from their endowment
 148 per year.

149 4.1.1. Types of Endowments

150 There are **three categories** of endowment funds as defined by the IRS.

- 151 • **Term endowments**(temporarily restricted endowments) are funds that are donor-restricted, which
 152 means they are meant to be used for a certain amount of time or until a particular event.
- 153 • **Permanent endowments** are endowment funds from donor-restricted gifts where the initial fund
 154 must be invested; however gains or losses from these investments can be used by the organization.
- 155 • **Board-designated or quasi-endowment** are funds that were internally designated for specific
 156 use but are not donor-restricted. Investment gains and losses are typically utilized; however, the
 157 principal funds can be expended at any time.

159 Most dance companies have their endowment funds primarily in the permanent endowment
 160 category, whereas the proportion held as a board designated/quasi-endowment is typically less than
 161 25%, as is the proportion held as a temporarily restricted endowment (1). For the majority of companies,
 162 the proportions held in each category are fairly consistent across the years. In fact, some companies
 163 held their endowment in a single category across all years on file (Table 2).

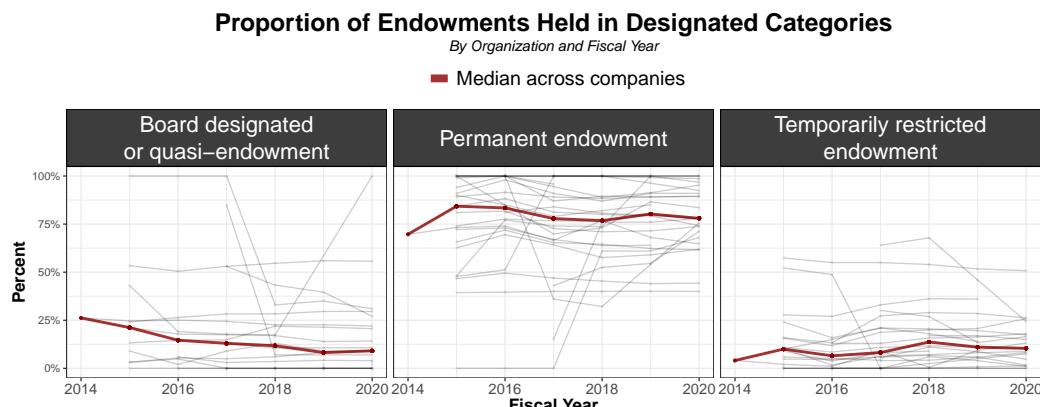


Figure 1. The percent of endowments held as a temporarily restricted endowment, permanent endowment, or board designated or quasi-endowment. The median across all companies by fiscal year is shown in red.

However, there are several notable exceptions to the general trend of consistency across years.

Defining variability as the maximum standard deviation of the proportions for each category, the most variable 5 companies were Fort Wayne Ballet, San Francisco Ballet, Nashville Ballet, Atlanta Ballet, and the Washington Ballet (Figure 2).

- For Fort Wayne Ballet, most of the endowment funds (86%) were board designated/quasi-endowment in 2017, but this dropped to a mere 7% in 2018. The percentage of the endowment funds in the permanent endowment category increased accordingly.
- 100% of San Francisco Ballet's endowment was in the board designated/quasi-endowment category up until 2018, when the percentage in board designated/quasi-endowment dropped to 33% and most (61%) was a permanent endowment.
- The trends in Nashville Ballet's endowment went the opposite direction, with a large increase in the percentage in the board designated/quasi-endowment category (17% to 74%) and decrease in the percentage in the permanent category.
- For Atlanta Ballet, there is a dramatic shift in 2017 where the percentage held as temporarily restricted goes from 0% to 64%.
- The Washington Ballet had a high proportion of its endowment in the temporarily restricted category (52%) but by 2017 all their endowment funds were in the permanent endowment category.

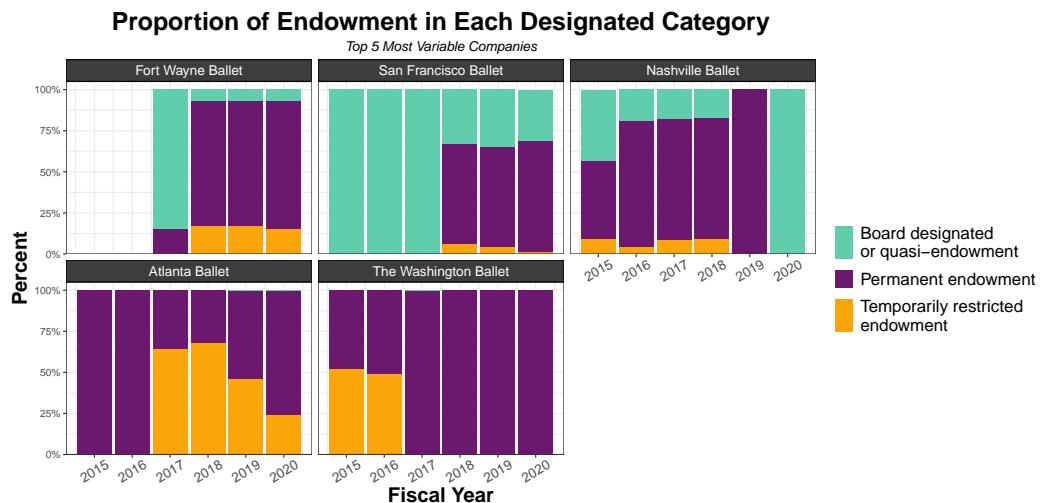


Figure 2. Proportions of endowments in each designated category over time for the 5 companies with the most variability. We defined the most variable companies by considering the maximum standard deviation in the proportion in any one category.

182 4.1.2. Which Companies have Endowments?

183 As we discuss these endowment analyses, one of the most fundamental questions about
 184 endowments is how many companies report them, and how that varies over time. To report
 185 endowments, nonprofits fill out Schedule D in Form 990. Out of 169 dance companies we investigated,
 186 47 reported endowments at least once in Schedule D (Table ??).

Table 3. Number of Companies that Reported an Endowment

	Reported an Endowment	Did Not Report an Endowment
By Year		
2014	6	1
2015	70	35
2016	79	37
2017	83	42
2018	96	40
2019	106	40
2020	83	40
2021	21	6
Reported an Endowment at Least Once		
	122	47

187 4.1.3. Ranking Companies' Endowments

188 Ranking companies can be useful to see how endowments did relative to each other rather than
 189 looking at the raw values, which are on immensely different scales.

190 When we look at the rankings of the beginning of year balance of companies' endowments, we
 191 see immediately that the top 7 companies, New York City Ballet, San Francisco Ballet, Houston Ballet,
 192 Alvin Ailey American Dance Theater, American Ballet Theatre, Pacific Northwest Ballet, and Boston
 193 Ballet, see no changes in ranking from 2013 to 2020 (Figure 3).

194 Below the top 7, there are more shifts in the rankings across time, with some notable companies
 195 changing dramatically in ranking. This includes:

- 196 • A dramatic decrease in Aspen Santa Fe Ballet's ranking from 2018 through 2020
 197 • A marked increase in:
 198 – Joffrey Ballet's ranking
 199 – Orlando Ballet's ranking
 200 – Fort Wayne Ballet's ranking
 201 – Ballet Arizona's ranking
 202 • A decrease in Atlanta Ballet's ranking from 2013 to 2015 that then recovered.

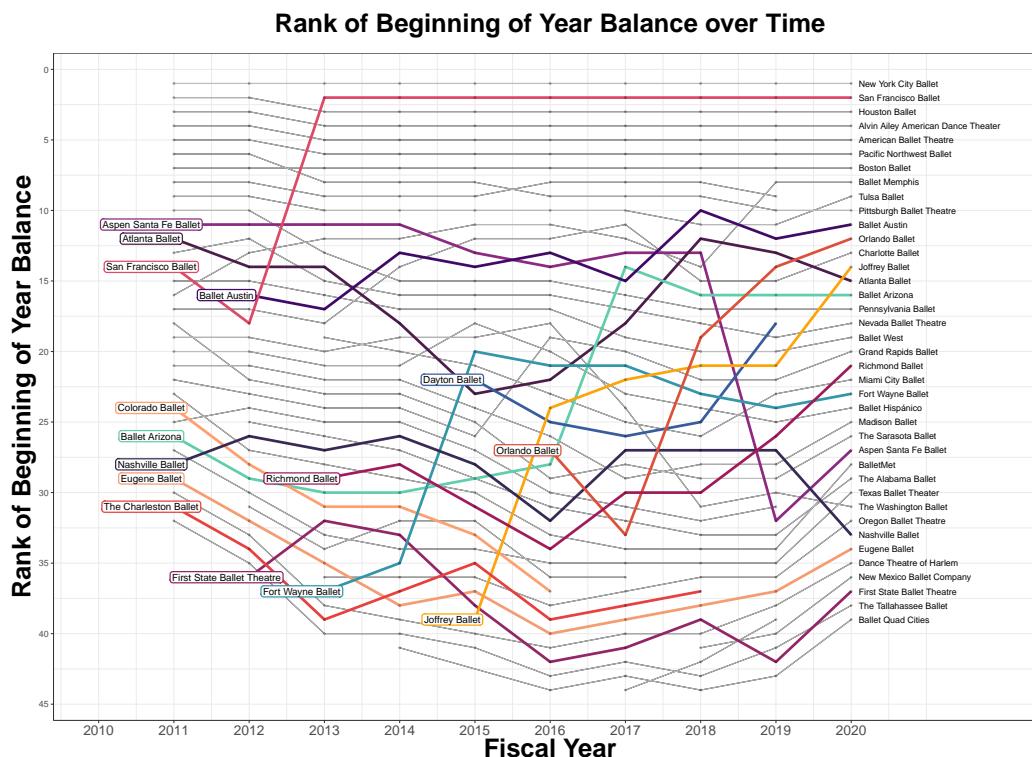


Figure 3. Rank of the endowment beginning of year balance over time. The 15 companies with the most variability in ranking, defined as the mean difference in rankings between fiscal years, are shown in color. Names of all companies are on the right.

203 When we add information on how these companies ranked in contributions (Figure 4), we see
 204 that although some organizations that are top ranked in endowment balance are also top ranked in
 205 mean contributions, several of the companies that experienced notable changes in their rankings also
 206 were ranked high in contributions, in particular, Orlando Ballet and Joffrey Ballet.

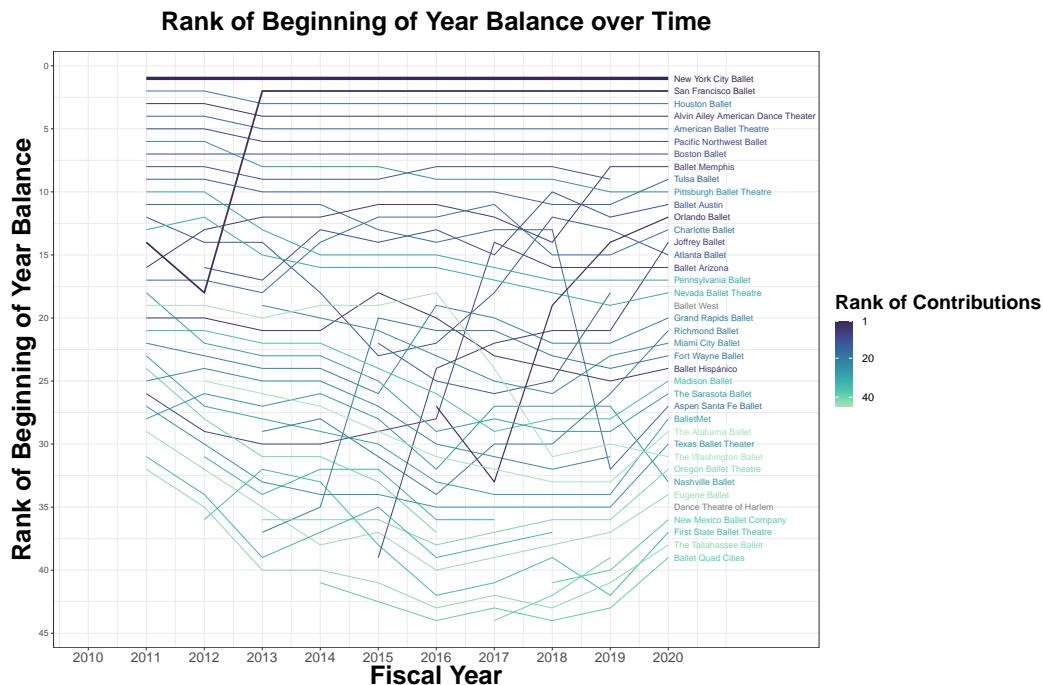


Figure 4. Rank of the endowment beginning of year balance over time, where the color indicates the ranking of the mean contributions received over all years on file for the company.

Looking more closely at the relationship between contribution rankings and beginning of year balance rankings, in Figure 5, there is a strong relationship between how a company ranks with regard to their contributions relative to the other companies and how a company ranks in the endowment beginning of year balance. That is, when companies are ranked high in the beginning of year balance, they tend to rank high in contributions as well. As we would expect, this trend holds across the full set of fiscal years considered.

However, the rankings are often not identical. If they were, all points would fall on the red line, which represents an exact correspondence between rankings. In some cases, a company consistently ranks higher in contributions relative to the beginning of year balance. We summarize whether the contributions or beginning of year balance tends to rank higher for a given company in Figure 6. For example, Ballet West ranked higher in the endowment beginning of year balance for each year available (2016-2020), while Nashville Ballet ranked higher in contributions than beginning of year balance for every year on file (2011-2022).

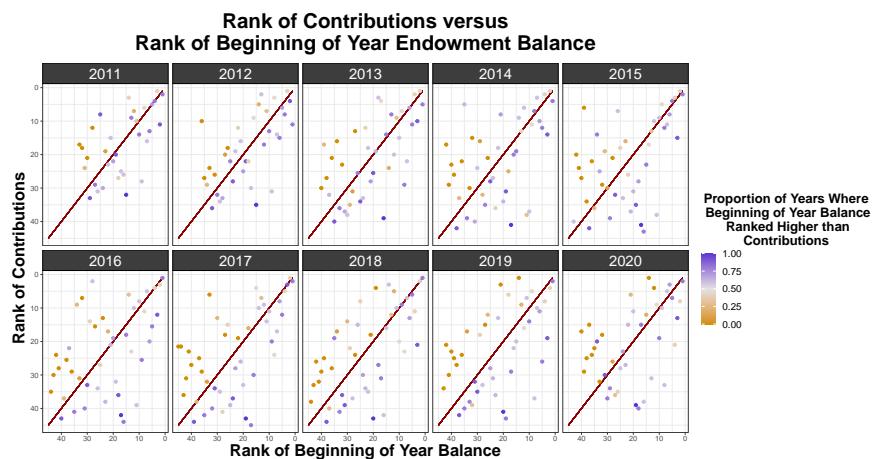


Figure 5. Comparing the rankings of beginning of year balance of the endowment to the ranking of contributions received.

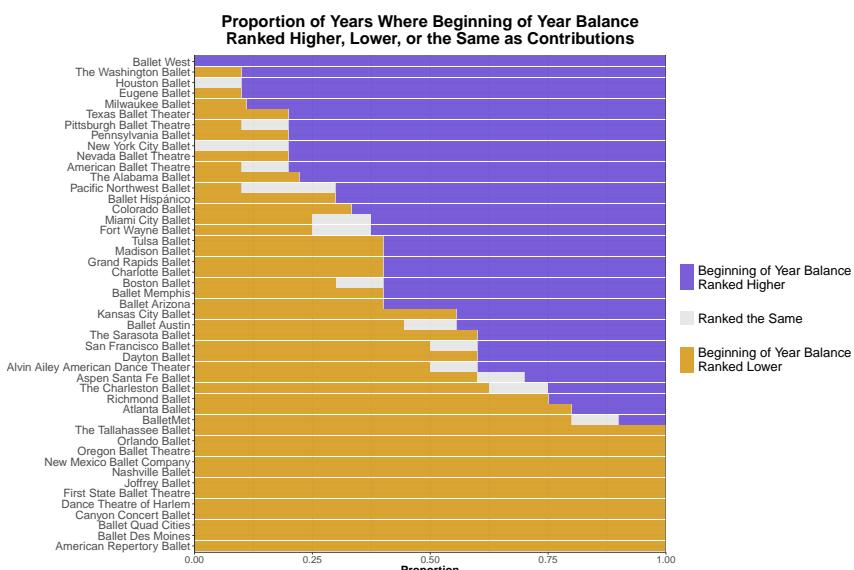


Figure 6. Comparing the proportion of years where a company ranked higher, lower, or the same in beginning of year balance compared to contributions received. A higher rank means a rank closer to 1, where 1 is the top possible rank.

220 In contrast to what we saw in the rankings of the beginning of year balance (Figures 4 and 3, we
221 see in Figure 7 that the rankings of contributions are much less consistent.

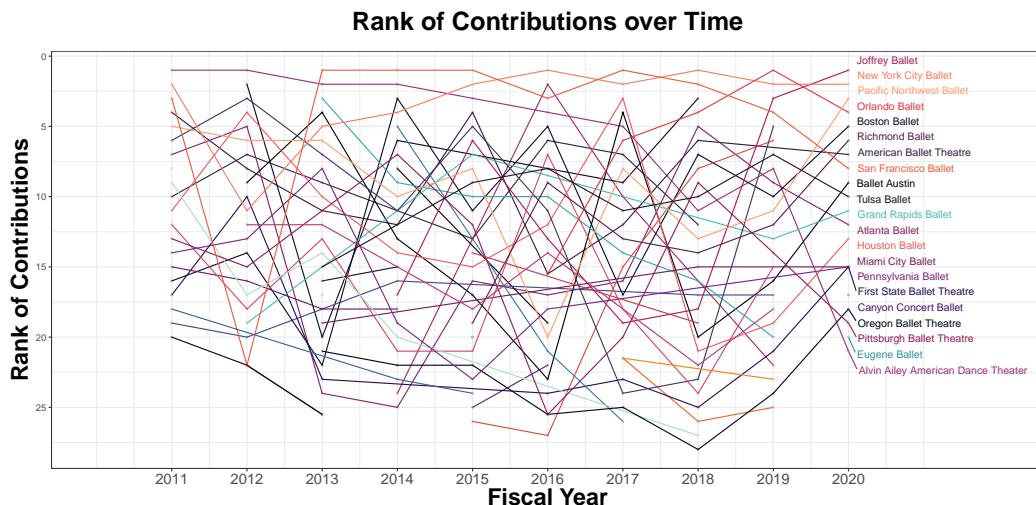


Figure 7. The rankings of contributions over time, by organization.

222 4.1.4. Reported Endowment Balances over time - Is the Math right?

223 Theoretically, one can calculate an endowment's fiscal year end balance based on all information
 224 provided in Schedule D. We calculated the end of year balance (see the equation below), and then
 225 compared our calculated balance to the reported end of year balance. The majority of calculations
 226 are concordant; however, we noted discrepancies in thirteen companies. Discrepancies range from
 227 \$-20,000 (Orlando Ballet, 2016) to \$8,301,066 (Atlanta Ballet, 2017). Due to the scaling of the below
 228 figure, differences in reported and calculated balance below a hundred thousand dollars are difficult
 229 to see.

$$\begin{aligned}
 230 \quad \text{Calculated Year End Balance} = & \text{ Beginning Year Balance} + \text{Contributions} + \\
 231 \quad & \text{Investment Earnings or Losses} - |\text{Administrative Expenditures}| - \\
 232 \quad & |\text{Other Expenditures}| - |\text{Grants or Scholarships}| \quad (1)
 \end{aligned}$$

232 For values related to expenses (administrative expenditures, other expenditures, grants or
 233 scholarships), we took the absolute value to ensure all were positive numbers. Four companies
 234 (Ballet Hispánico, Atlanta Ballet, Miami City Ballet, and Dance Theatre of Harlem) report their other
 235 expenditures as a negative value; thus, when calculating end year balance, subtracting a negative
 236 value would result in an additive, not subtractive, effect²

237 We see the difference in the extent of discrepancies when we take the absolute value (Figure 8 (a)),
 238 as in equation (1), versus when we do not (Figure 8 (b)). There are less discrepancies when we do take
 239 the absolute value.

240 Since we compute the difference by taking Reported End Balance – Calculated End Balance,
 241 negative values indicate the calculated end balance was larger than the reported, and positive values
 242 indicate the reported end balance was larger. The calculated differences are split between being
 243 negative or positive.

244 Atlanta Ballet has the largest discrepancy in (a); however, we see that if we don't take the absolute
 245 value and take the negatives as is (b), the values are concordant.

246 Considering panel (a), most companies only miscalculate once; however, there are multiple
 247 miscalculations for Fort Wayne Ballet, Atlanta Ballet, and Ballet Arizona. Of note, some of these

² We hope to reach out to the prior companies regarding their decision to report negative values, to ensure we do not misrepresent their decision.

248 differences were trivial (e.g., \$10). Eugene Ballet does not report an end year balance for 2011, yet
 249 reports a beginning balance of \$45,000, hence the -\$45,000 difference we see for this year.

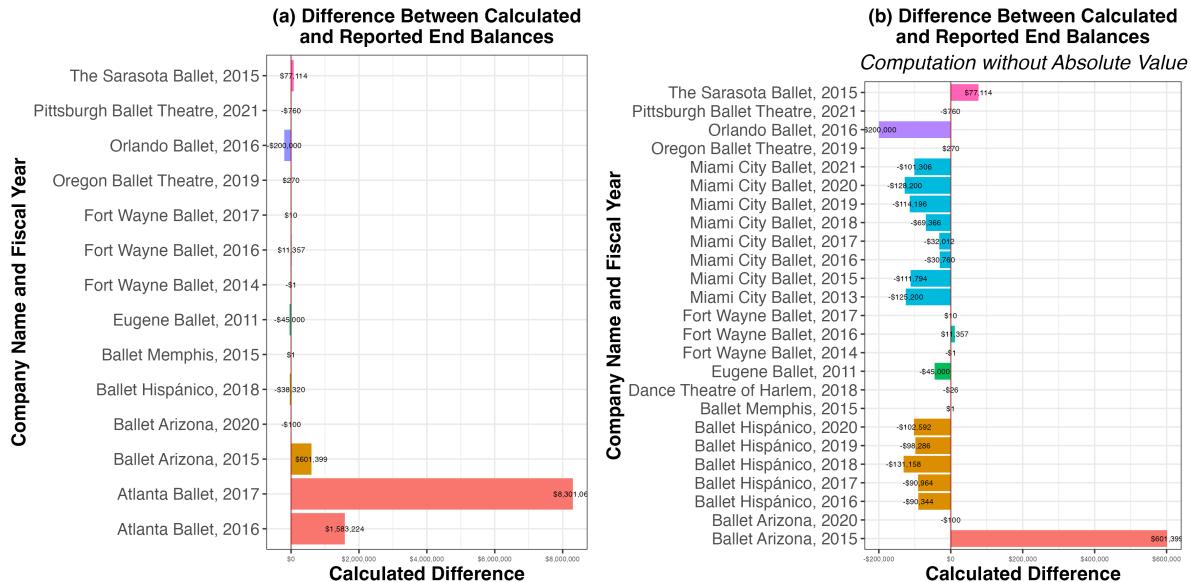


Figure 8. Comparing the reported end of year balance to that we computed based on other reported variables. Calculation is done with the absolute value in (a) and without in (b). Each organization is in a different color.

250 We summarize these discrepancies by company in Figure ??.

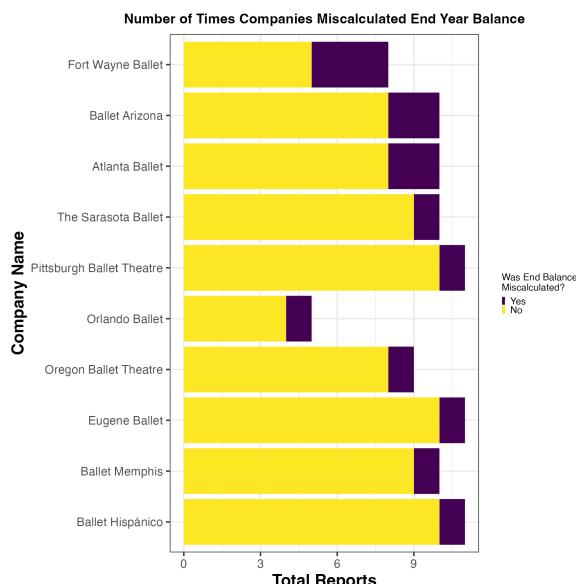


Figure 9. Number of observations where there was a discrepancy between the calculated and reported end of year balance, using the absolute value equation given in equation (1).

251 4.1.5. How Endowments Did Over Time

252 Annual percent change is the percent change from one value to the next at the end of a year-long
 253 period. With regard to endowment balances, the annual percent change in endowment balance is a
 254 comparison between the endowment at the beginning of the fiscal year and the endowment of the end
 255 of the fiscal year, which allows us to interpret by what percent the endowment has grown or shrunk.
 256 Charting percent change over time allows us to view endowment behavior over time; further, we can

257 compare percent changes between companies to get a sense for trends in how different companies'
258 endowments change.

259 To provide some context on the interpretation of percent change, we first state a couple of standard
260 definitions.

261 The relative change, which represents how much a value has changed relative to its initial value,
262 is

$$\text{Relative change} = \frac{\text{End Value} - \text{Start Value}}{\text{Start Value}}.$$

263 The effect of considering relative change means that we can more easily compare companies that
264 have enormously different beginning of year balance sizes. For a company with a small endowment, a
265 difference of 10,000 may be substantial, while the same difference would be minimal if the company
266 has over a million in its endowment.

267 The percent change, which is the relative change in percentage form, is simply Relative Change \times
268 100.

269 When we are considering the percent change within a fiscal year, that is, from the beginning of
270 year balance to the end of year balance, a couple of examples of the interpretation include³:

- 271 • If the percent change is -50% , the endowment's value at the end of the fiscal year is half of what
272 it was at the beginning.
- 273 • If the percent change is 100% , the endowment's value at the end of the fiscal year is twice that it
274 was at the beginning.
- 275 • If the percent change is -100% , the endowment's value dropped to zero throughout the fiscal
276 year.

278 We calculated each company's within-year percent change of endowment balance, as this allows
279 us to compare the performance of different companies' endowments over time. A positive percent
280 change indicates growth within the fiscal year; a negative percent change indicates loss.

281 The percent change of most companies falls between -100% and 200% (Figure 11). There are
282 notable outliers, however, such as Joffrey Ballet in 2016 with a $\sim 3,000\%$ increase (10). By focusing on
283 lines between -100% and 200% , we can see a trend appearing, with many companies growing and
284 shrinking at similar rates around similar times. Thus, plotting the within-year percent change of the
285 S&P 500, we can see that many companies' endowment balances reflect the performance of the stock
286 market. To assess companies' "raw" performance, we adjusted all percent changes for investment
287 earnings or losses, which flattened the stock market trend (Figure 12).

³ For a relative change of value R , it can be more intuitive to interpret it by considering the expression End Value = $(R + 1) \times \text{Start Value}$. That is, if we have a relative change, we simply add 1 to it and multiply it by the starting value to acquire the end value.

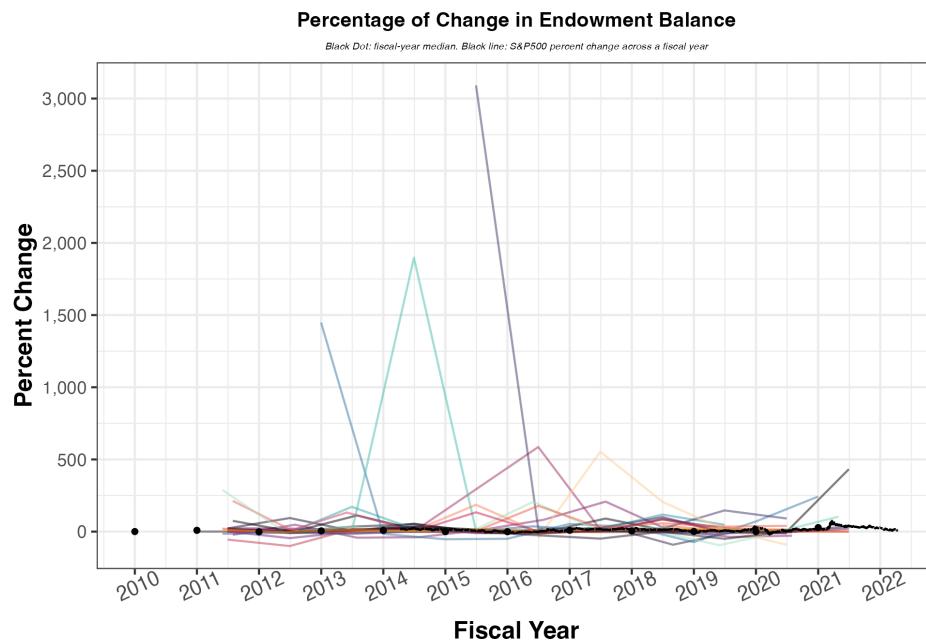


Figure 10. Percent change in endowment balance over time, including the full range of percent changes, revealing several clear outliers.

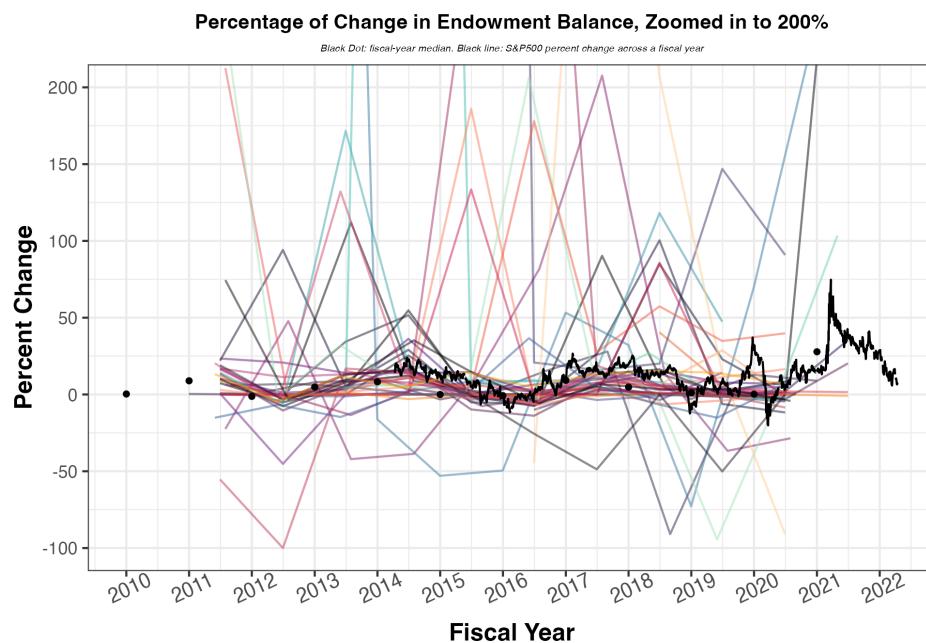


Figure 11. Percent change in endowment balance over time, restricting the range to -200 percent to 200 percent to remove outliers than reduce our ability to see trends for the majority of companies.

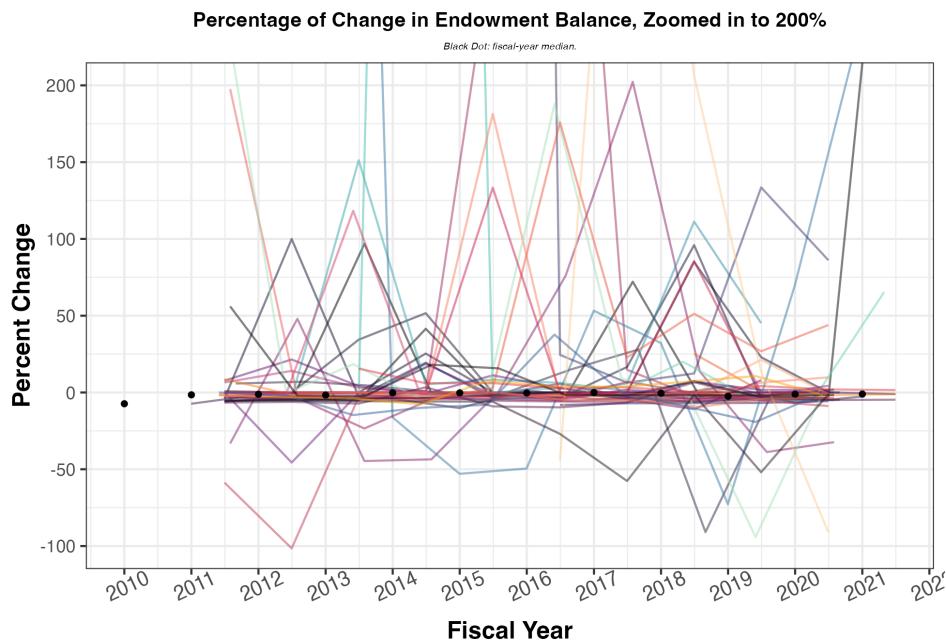


Figure 12. Adjusting for investment earnings or losses when computing the endowment percent changes flattens the trends we see when using the unadjusted endowment values.

288 Examining particular companies (Figure 13), we can see that eight companies reduce their
 289 endowment by over 40% (Percent Change lower than -40%) across multiple years. There are eight
 290 companies that do so: Aspen Santa Fe Ballet, Atlanta Ballet, First State Ballet Theatre, Nashville Ballet,
 291 Orlando Ballet, San Francisco Ballet, and The Washington Ballet. Some of these companies reduce their
 292 endowments by over 40% multiple times.

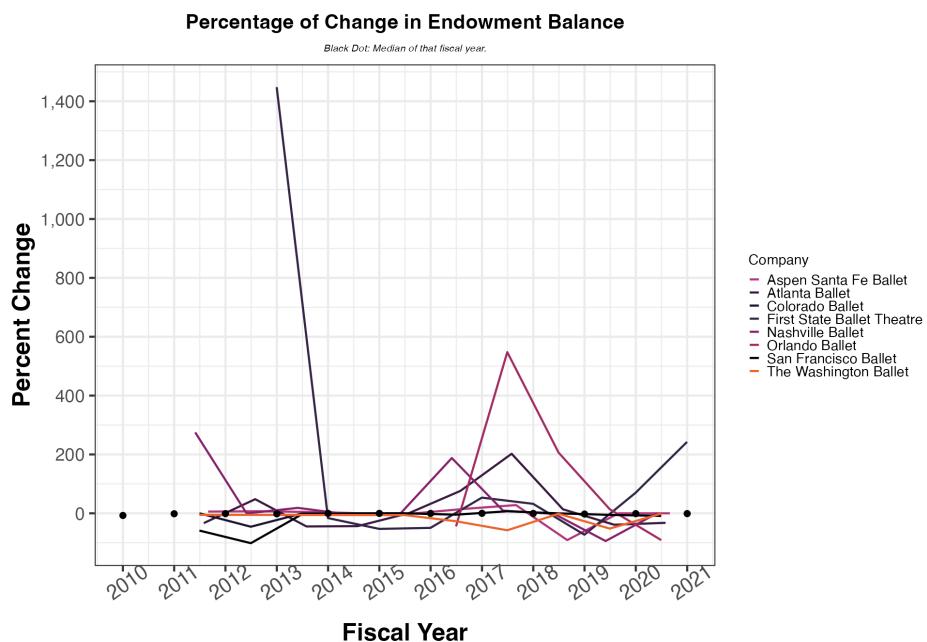


Figure 13. Companies that reduce their endowment by over 40 percent.

293 Additionally, we can see that eight companies increased their endowment by over 200% (percent
 294 Change higher than 200%) across multiple years, which means they tripled their endowment (14).

Table 4. Endowment Percent Change Dropping Below 40 Percent Of Beginning Year balance

Company Name	Percent Change	Beginning Balance	End Balance	Fiscal Year
Aspen Santa Fe Ballet	-90.9	6065013	550000	2018
Atlanta Ballet	-43.5	1706513	1046921	2014
Atlanta Ballet	-44.6	2947203	1706513	2013
Colorado Ballet	-45.6	182437	100000	2012
First State Ballet Theatre	-72.7	36693	10000	2018
First State Ballet Theatre	-49.5	35876	18107	2015
First State Ballet Theatre	-53.0	76261	35876	2014
Nashville Ballet	-94.2	1095624	61350	2019
Orlando Ballet	-91.0	7732855	696082	2020
Orlando Ballet	-44.3	613186	338943	2016
San Francisco Ballet	-101.5	1035814	174	2012
San Francisco Ballet	-58.7	2318646	1035814	2011
The Washington Ballet	-51.9	621423	310000	2019
The Washington Ballet	-57.6	1212247	621423	2017

²⁹⁵ These eight companies are: Atlanta Ballet, Ballet Arizona, Ballet Hispánico, First State Ballet Theatre,

²⁹⁶ Fort Wayne Ballet, Joffrey Ballet, Nashville Ballet, and Orlando Ballet.

Percentage of Change in Endowment Balance

Black Dot: Median of that fiscal year.

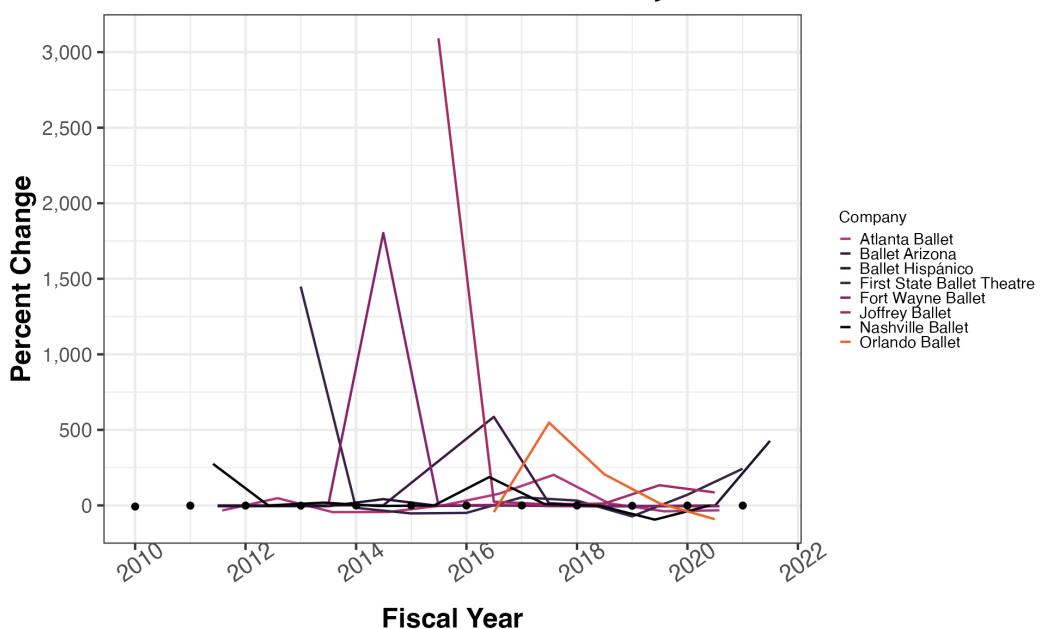
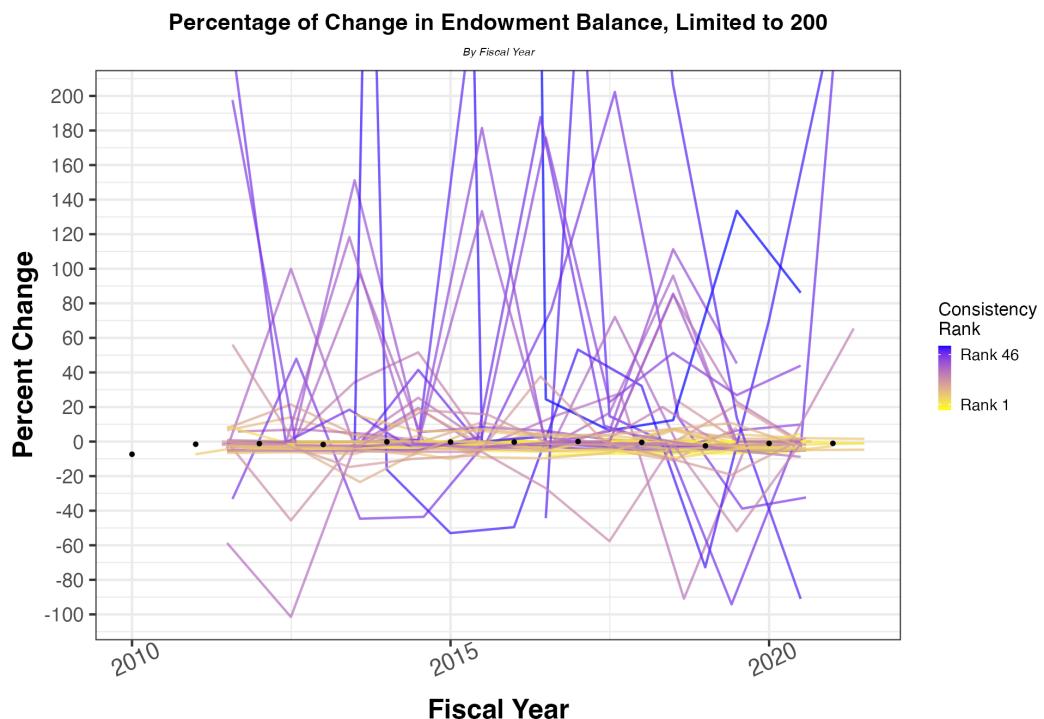
**Figure 14.** Annual percent change for companies that increased their endowment over 200 percent.

Table 5. Endowment Percent Change Increasing Beyond 200 Percent Of Beginning Year Balance

Company Name	Percent Change	Beginning Balance	End Balance	Fiscal Year
Atlanta Ballet	202.3	2119967	6523144	2017
Ballet Arizona	586.1	601399	4126424	2016
Ballet Hispánico	426.8	1405952	7481852	2021
First State Ballet Theatre	242.7	16999	58253	2020
First State Ballet Theatre	242.7	16999	58253	2020
First State Ballet Theatre	1448.1	5874	90934	2012
Fort Wayne Ballet	1803.3	60137	1201082	2014
Joffrey Ballet	3091.4	35600	1136139	2015
Nashville Ballet	275.0	54543	212030	2011
Orlando Ballet	206.4	2212808	6791249	2018
Orlando Ballet	547.7	338943	2212808	2017

297 To examine the behavior of endowments, we ranked each company by its consistency—the higher
 298 the standard deviation⁴ (how much on average each point deviates from the mean), the lower the
 299 consistency (Figure 15). We find that many companies who have consistent balances tend to not make
 300 large adjustments to their percent change. Further, consistency in endowment does not appear to be
 301 related to company size (Figure 16), as measured by both endowment total balance and number of
 302 employees.

**Figure 15**

⁴ Here, we are taking the standard deviation of the percent changes for a company across all years on file for that company.

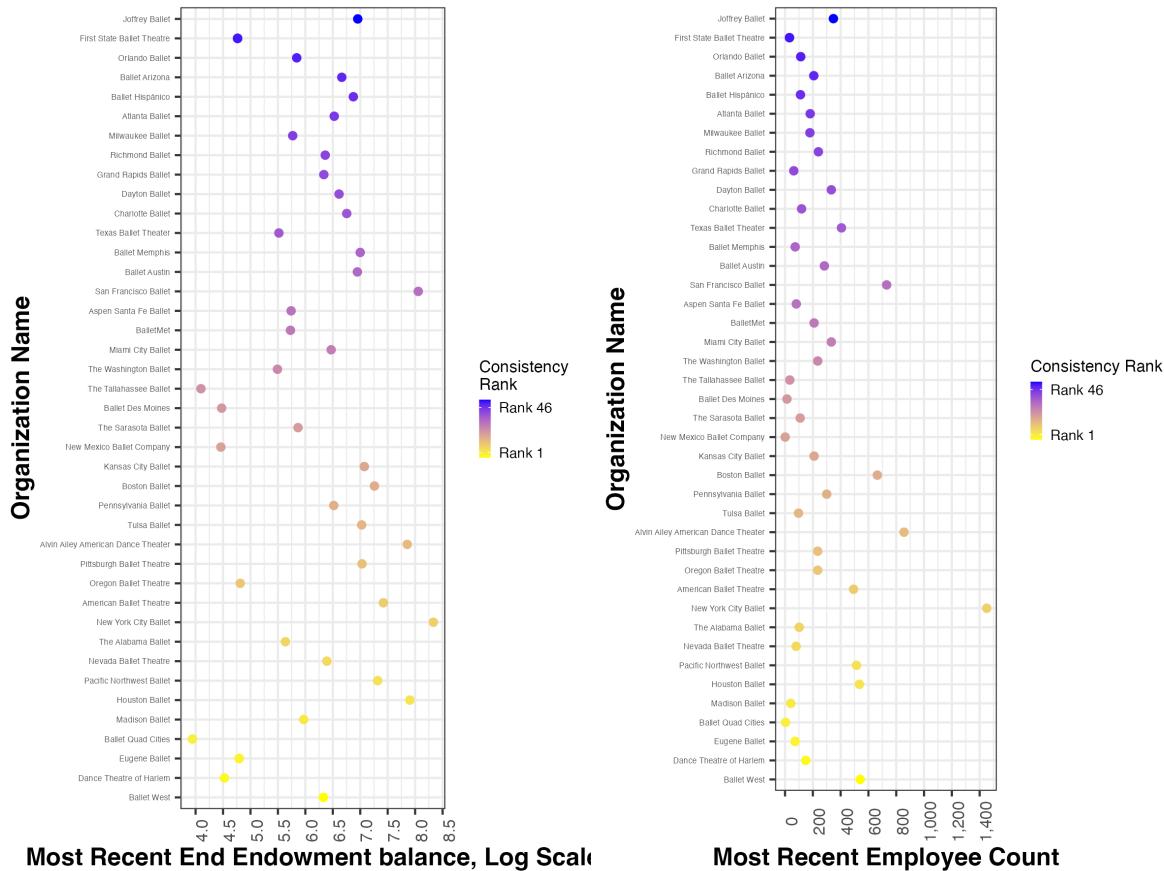


Figure 16

303 4.1.6. Compound Annual Growth Rate

304 The compound annual growth rate is a useful way to summarize the performance of different
 305 endowments over the same time period, since the variability in annual growth rates can make it
 306 difficult to see broader trends. We can think of this rate where, if the value grew by this same rate each
 307 year, would give us the end value at the end of the time period considered.

308 When we look at compound annual growth rate in this setting, we want to account for withdrawals
 309 and contributions to separate how endowments are doing due to investment decisions versus how
 310 they change due to large contributions or withdrawals.

311 The basic formula for the compound growth rate over t years is

$$\text{Compound Annual Growth Rate} = \left(\frac{\text{End Value}}{\text{Beginning Value}} \right)^{\frac{1}{t}} - 1.$$

312 Withdrawals as reported on the 990 include other expenditures, grants and scholarships, and
 313 administrative expenses.

314 This means we can compute the withdrawals for any given year and company as

$$\text{Withdrawals} = \text{Other Expenditures} + \text{Administrative Expenses} + \text{Administrative Expenses} + \text{Grants and Scholarships}.$$

315 To adjust for contributions and expenditures, we define the Compound Annual Growth Rate as

$$\left(\frac{\text{End Value} + \sum_{i=1}^{t-1} \text{Withdrawals} - \sum_{i=1}^{t-1} \text{Contributions}}{\text{Beginning Value}} \right)^{\frac{1}{t}} - 1.$$

316 Adding back the withdrawals and subtracting off the contributions allows us to see differences
317 that are due specifically to investment choices. Otherwise, we would not be able to tell whether a large
318 increase in endowment funds in a particular year was due to investment gains or a large contribution.

319 In Figure 17, we compare the compound growth rates of the companies to the compound growth
320 rate of the S&P 500 over the same time period, where we use the S&P 500 as a benchmark to indicate
321 how the stock market is doing overall. Variations in the S&P 500 across companies for a given time
322 interval are due to differences in their fiscal years. While Ballet Arizona and San Francisco have
323 enormous differences when considering the time intervals 2011 to 2020 and 2015 to 2020, it is unclear
324 whether these changes are truly this large in magnitude or if the differences are due to discrepancies
325 in reporting. Although we reached out to both companies to clarify discrepancies in early years, we
326 received no reply.

327 A substantial proportion (about 40% of the companies for the 2011-2020 time period, and about
328 50% of companies for the 2015-2020 and 2017-2020 time periods) had a compound annual growth rate
329 less than 0.05%. We see the same concept at a more granular level considering the annual growth rates
330 in Figure 18.

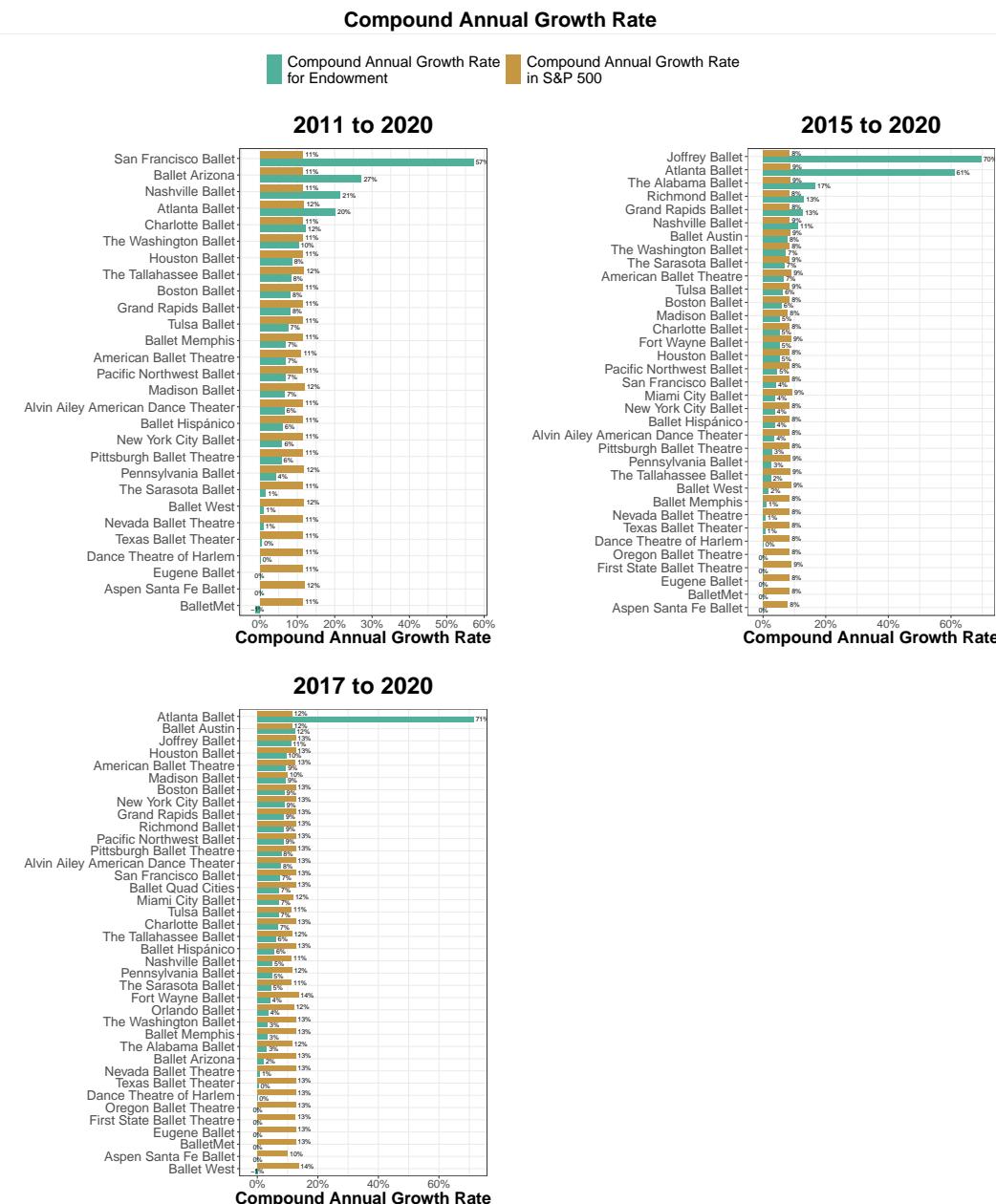


Figure 17. Compound annual growth rates for all organizations compared to the compound annual growth rate for the S&P 500 for three time periods. Not all companies are present in each plot, since not all companies have data going back the same number of years. Of note, year to year differences in the compound annual growth rate of the S&P 500 are due to differences in companies' fiscal years.

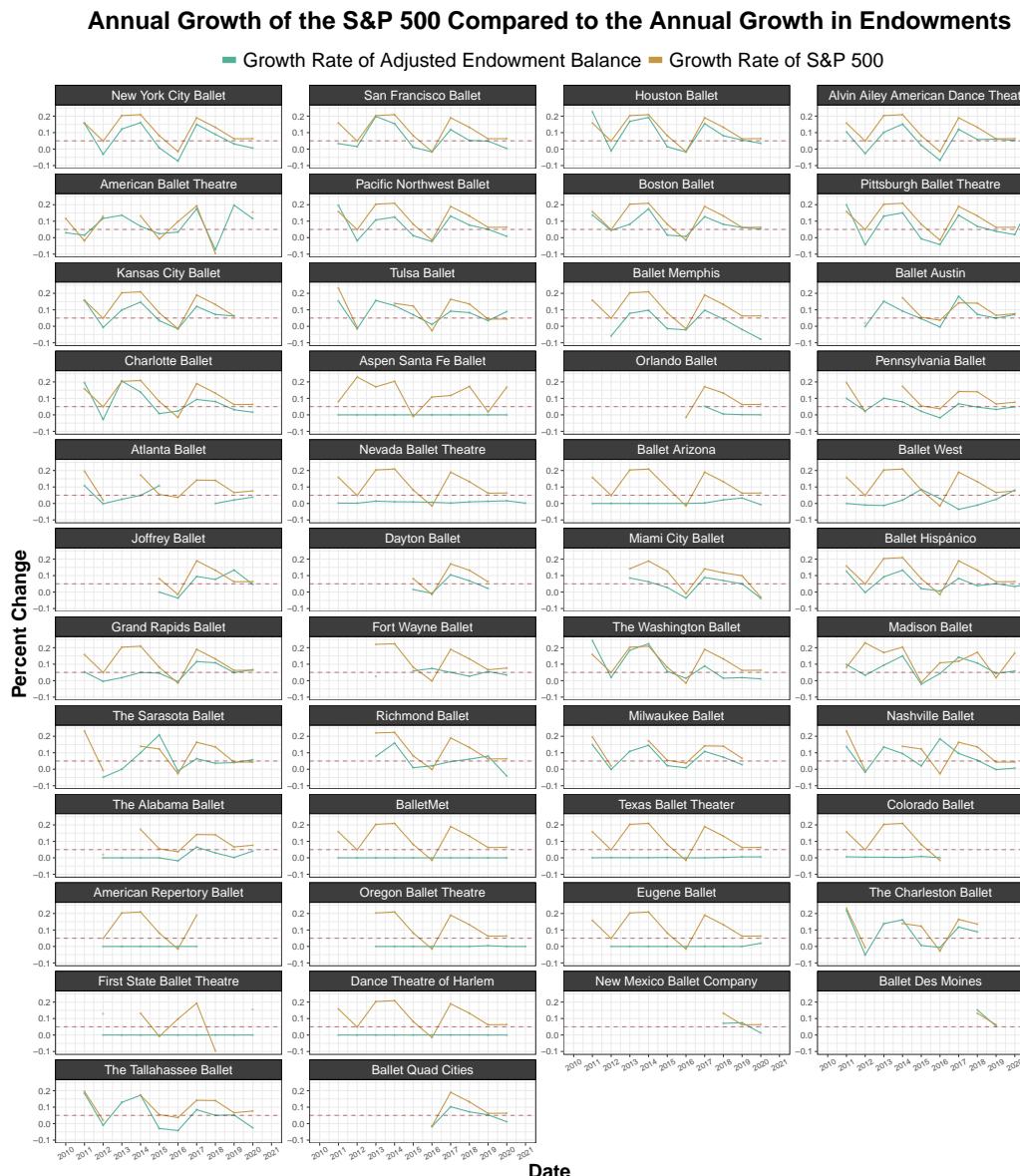


Figure 18. Annual growth rate of a company's endowment when adjusting for contributions and withdrawals, compared to the annual growth S&P 500 for the corresponding time period.

331 4.2. *Volunteer & Paid Labor*

332 4.2.1. *Volunteer Labor and Geography*

333 As we see in Figure 19, the South has the most companies who use more volunteers than
 334 employees with 68% of all reported companies volunteers, followed by the Midwest, then the West,
 335 then Mid-America, New England, and finally the Mid-Atlantic.

Distribution of Company Type in each Region

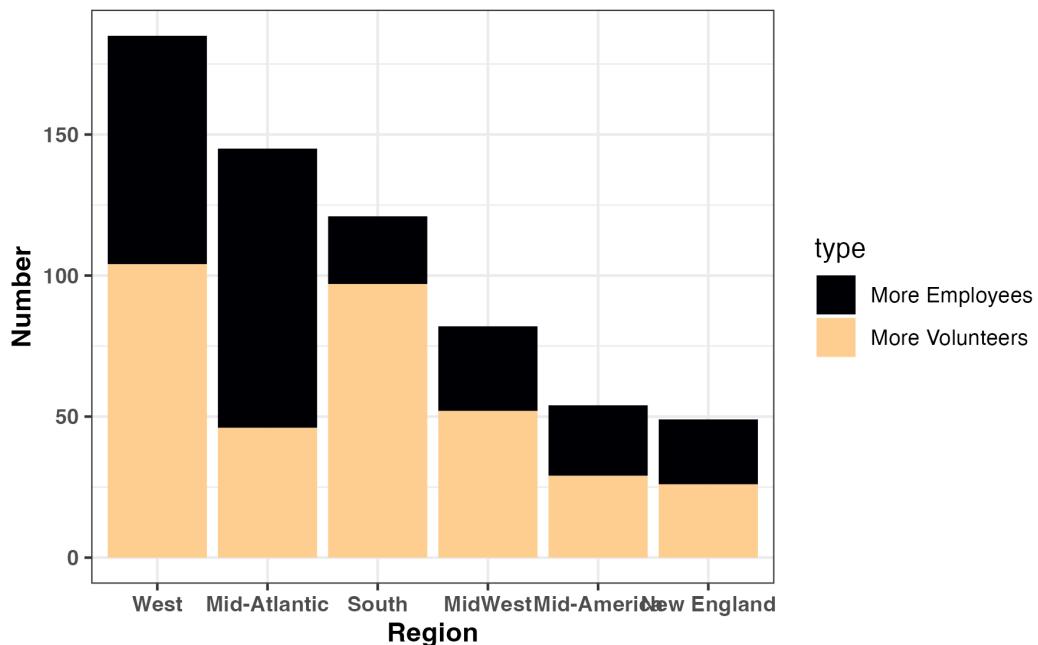


Figure 19. Total number of laborers reported for each region in the 2019 fiscal year, colored by the number of companies who report either more employees or more volunteers

In Figure 20, we show the 1st, 2nd, 3rd, and 4th quantiles of total volunteer labor. We ranked individual companies by the total number of volunteers they reported and then computed the quantiles. The share within each quantile is shown by region.

Volunteer Ratio in Companies by Region

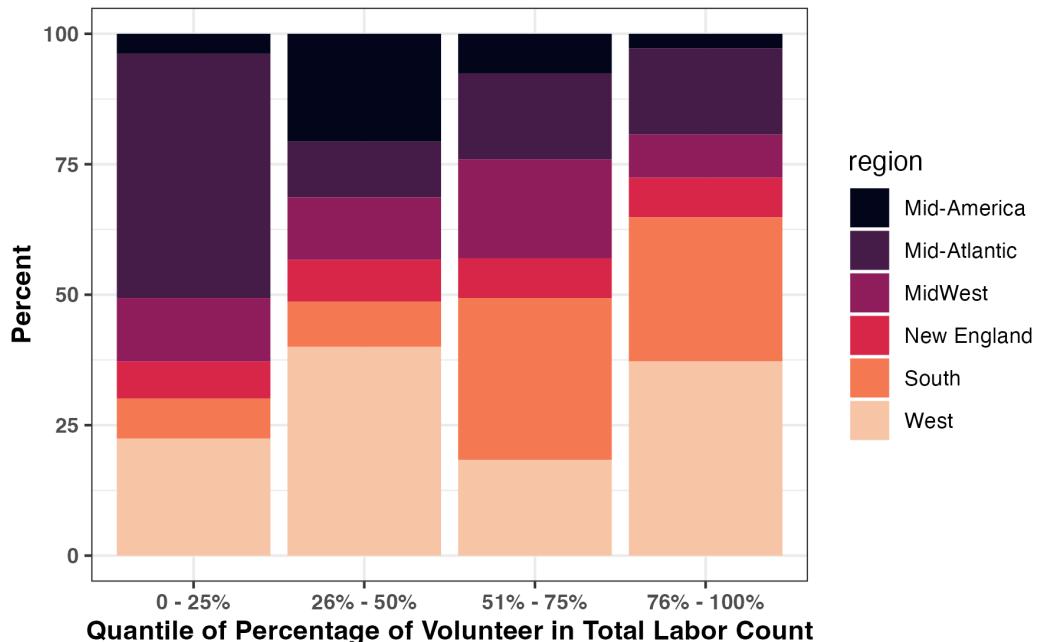


Figure 20. Share of volunteer use for each region by quantile using individual companies.

We visualize the percentage of total labor that was volunteer labor by state across the United States in Figure 21.

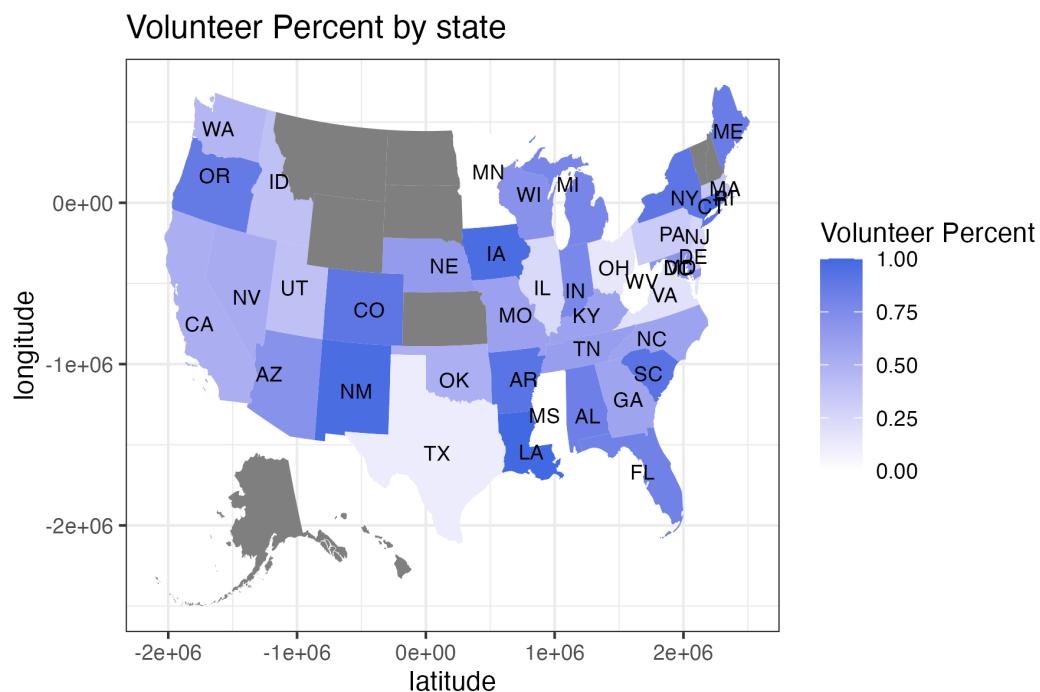


Figure 21. Share of volunteer labor among all labor by state. States, where we do not have data, are in gray.

341 4.2.2. Compensation to C-Suite Employees

342 As we we think about paid and unpaid labor in the dance industry, it is also useful to look how
 343 compensation is distributed among paid employees.

344 Part IX of the Form 990 contains information that allows us to examine the compensation going to
 345 the set of highest compensated employees as well as to other employees.

346 In particular, we can compare what percentage of total employee compensation was going to
 347 C-Suite employees. For this analysis, we only included companies with more than 45 employees. This
 348 choice was due to the extent of variability in the percentages paid to C-Suite employees in companies
 349 smaller than this threshold size, since there are some years where smaller companies report zero
 350 compensation to C-Suite employees.

351 The percentage paid to C-Suite employees ranges from 0% to a little over 30%, and is fairly
 352 constant over the years (Figure 22) . The median for each fiscal year was close to 10%. However, we
 353 do see with the limited data available for 2021 that percentages appear to increase following the onset
 354 of the pandemic; this trend will be important to consider as more data from 2021 is released.

355 In Figure 23, where we summarize the difference in the percentage of total compensation paid to
 356 C-Suite employees in 2020 to that in 2015, we see there's actually fairly even split between companies
 357 that increased the percent paid to C-Suite employees versus those that decreased the percent going to
 358 C-Suite employees.

Percent of Total Compensation Paid to C-Suite Employees

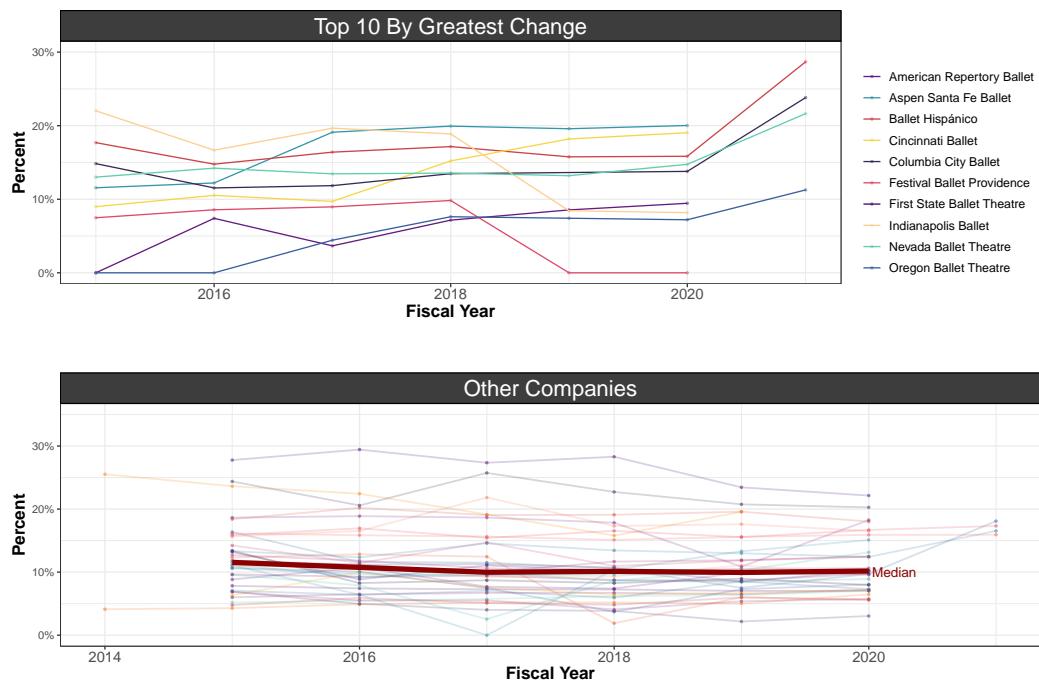


Figure 22. percent of the total compensation paid to employees that was paid to officers, directors, trustees, or key employees, as reported in Part IX of the Form 990. Highlighted in the first panel are the 10 companies that had the greatest change in the percent paid to C-Suite employees from the earliest year on file to the latest. Only companies with more than 45 employees and that reported complete data for more than 5 years are included.

Comparing Percent of Total Compensation Paid to C-Suite in 2015 to Percent Paid to C-Suite in 2020

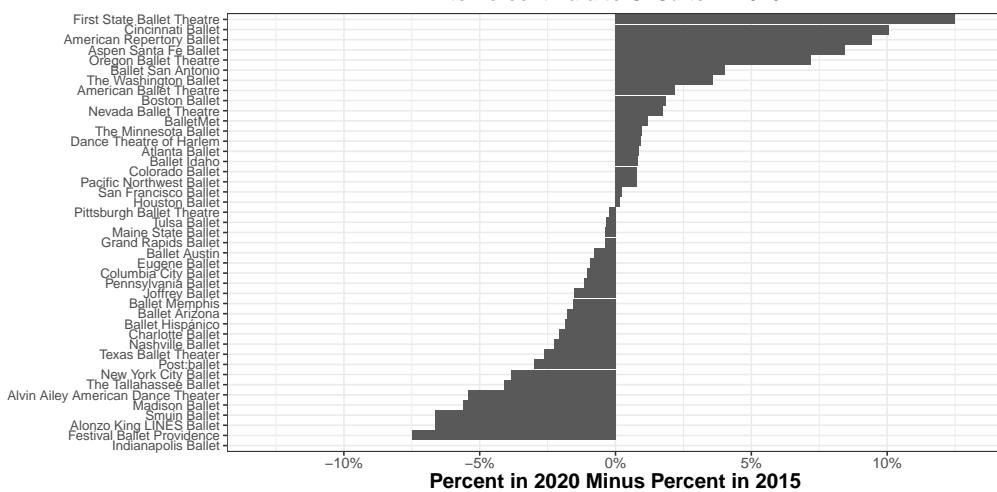


Figure 23. Comparing the percent of total compensation paid to C-Suite employees in 2015 to that in 2020. Since we are subtracting the 2015 percent from the 2020 percent, positive values indicate a greater percent of compensation went to C-Suite employees in 2020, while negative values indicate a smaller percent of compensation went to C-Suite employees in 2020.

359 4.3. Buildings

360 In-person performances are a huge part of dance companies' business, and many of shows are
 361 held in companies' own theaters. Therefore, analyzing how each company's endowment of buildings
 362 and lands, especially their book values, is important in understanding how these companies are faring
 363 economically. In this analysis, we define book values as the value of the asset recorded on the balance
 364 sheet, as reported in Part VI of Schedule D of the Form 990. For all the analyses included below, the
 365 book values are summed from all the buildings and lands owned by the company.

366 In the following plots, we consider one quantile at a time because these values are on such
 367 different scales, with some companies approaching 8×10^7 in book values, while others had less than
 368 1×10^5 .

369 4.3.1. The Trend in Property Book Values (high/medium/low by quantile)

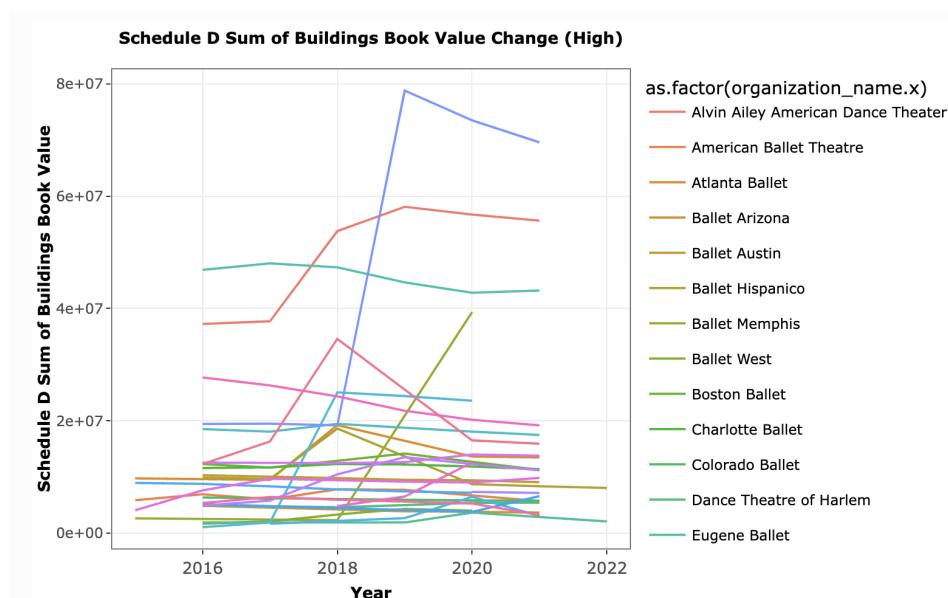


Figure 24

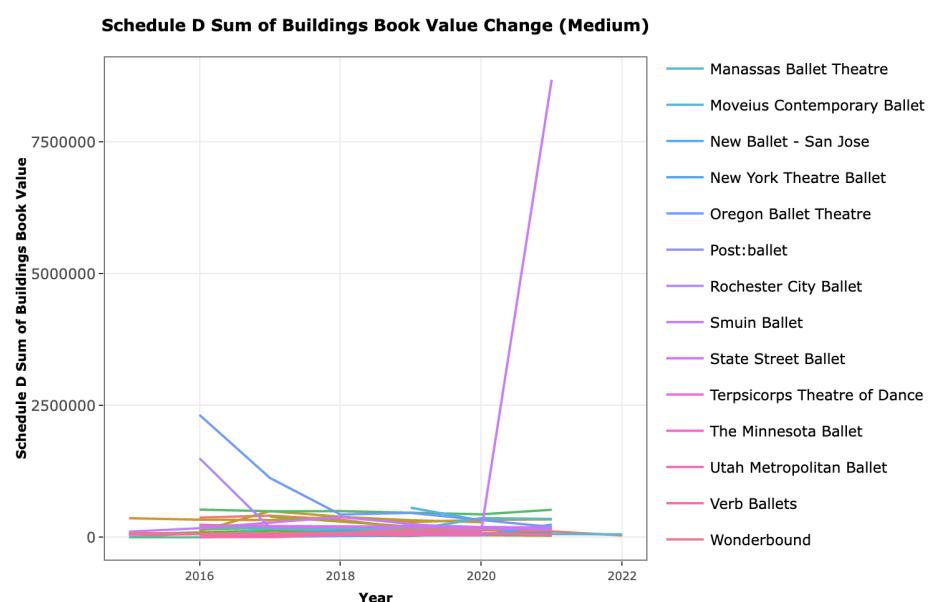
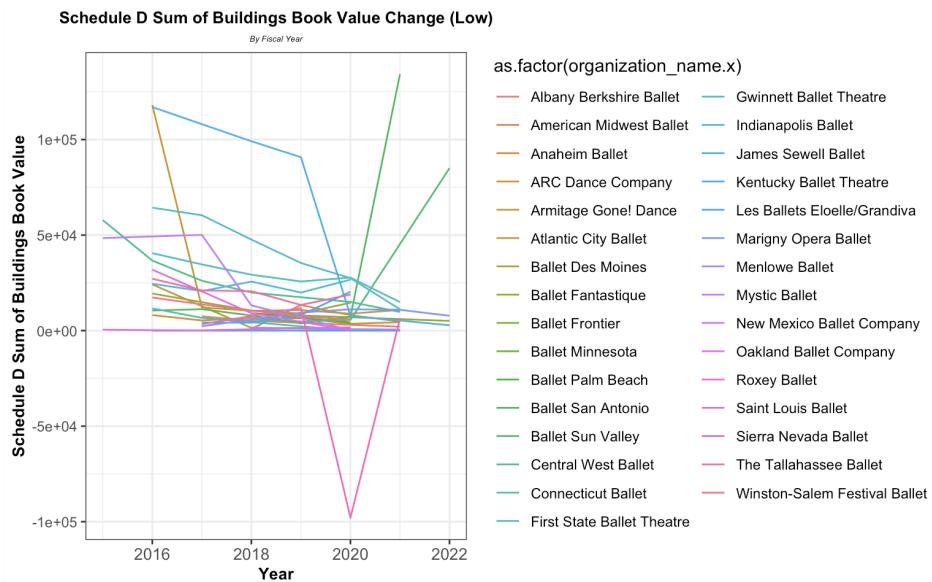


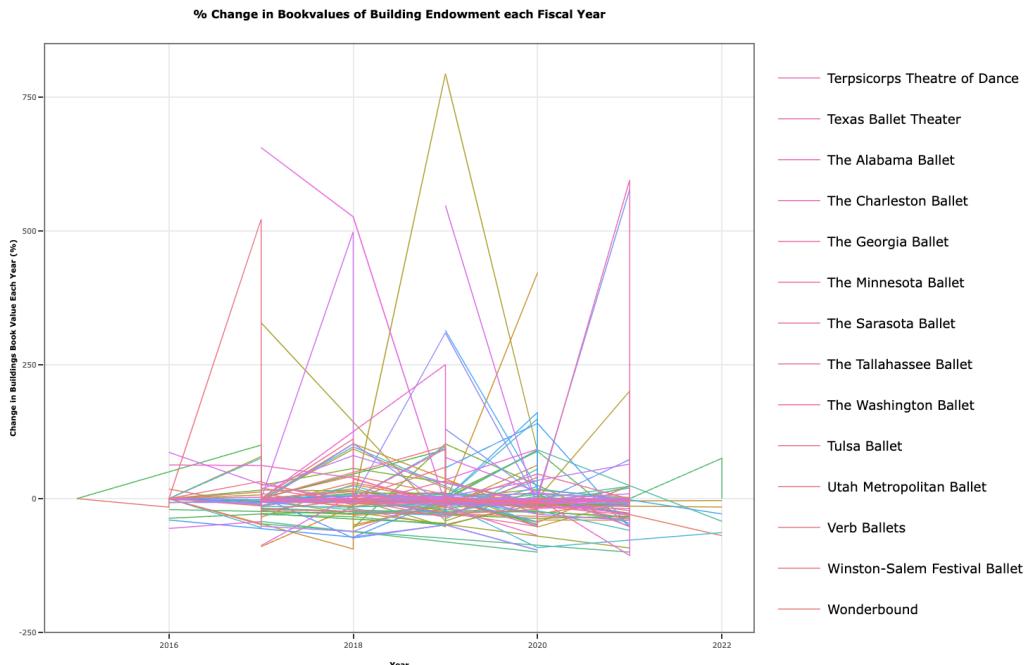
Figure 25

**Figure 26**

370 In Figures 24, 25, and 26, we see the percent changes in buildings' book values for each company
 371 from 2014 to 2021. We divided companies into three groups based on their building's book value: high,
 372 medium, and low, based on the quantile of their book values in 2020. Companies with notable changes
 373 for each category are:

- 374 • Major: New York City Ballet, Ballet Memphis, Tulsa Ballet.
- 375 • Medium: Smuin Ballet
- 376 • Low: Saint Louis Ballet, Les Ballets Eloelle/Grandiva, Ballet Palm Beach, Ballet

377 378 4.3.2. Percent change in Building Book Values



380 Most companies did not go through large changes in book values of buildings in their endowment
 381 besides depreciation. The companies went through larger changes include Utah Metropolitan Ballet,
 382

383 Post:ballet, Ballet Memphis, Philadanco, New Ballet San Jose, Sacramento Ballet, Marigny Opera Ballet,
 384 and Ballet Idaho.

385 4.3.3. Percent Change in Ranking

EIN	organization_name.x	year	change	BookValueSum
222587551	Island Moving Company	2017	Inf	166179
203447830	Boulder Ballet	2016	-3.390870e+04	85536
205888512	Collage Dance Collective	2021	9.567292e+03	695755
943197247	Smuin Ballet	2021	7.188102e+03	8681806
591837297	Florida Ballet Jacksonville	2021	5.812052e+03	1563324
311784286	BalletX	2018	3.496035e+03	797277
383945001	Cleveland Ballet	2021	2.000687e+03	58105
391134735	Milwaukee Ballet	2019	1.889604e+03	23903282
742371103	Ballet San Antonio	2021	1.763694e+03	134186
341645238	Verb Ballets	2018	1.652558e+03	47950
811657501	New Ballet - San Jose	2017	1.470690e+03	14576

386

387 4.3.4. Percentage change in book value by year

388 We can see from the mean that many extreme values exist in terms of changes in the building's
 389 book values.

390 5. Conclusions

391 5.1. Data Quality

392 As stated in the introduction, online reporting of tax returns by dance companies has facilitated
 393 this research; however, a long-standing issue with publicly-available tax reporting is there is no
 394 guarantee that mistakes are not made and published. Therefore, a significant part of our analyses were
 395 focused on checking the quality, completeness, and aberrations in values reported on the 990 forms.
 396 We found many discrepancies indicating non-concordance concerning the end of year balances and
 397 beginning year balances within the same year for many companies, where the values reported don't
 398 match indicating missing information. Additionally, values reported for previous years did not match
 399 what certain companies actually filed for those years with no apparent explanation. Many companies
 400 we reached out to for clarification did not respond. This issue should be addressed in future analyses.
 401 Implications for missing or inaccurate reporting on form 990s and 990EZs include misinforming the
 402 public. Data analyses run on inaccurate information may also draw false conclusions towards financial
 403 practices of certain companies that don't really exist. Informing dance companies on the importance of
 404 proper tax reporting may help address these errors in the future.

405 5.2. Endowments and the S&P 500

406 Our analyses have demonstrated that the trends of the stock market, and particularly the S&P 500,
 407 heavily influence percent change in the endowments of many companies. Other companies perform
 408 very differently from the S&P 500. This indicates that companies significantly differ in their investment
 409 behavior. Some companies differ in their investment behavior. Some companies, such as Oregon Ballet
 410 Theatre and Aspen Santa Fe Ballet, did not invest their endowments at all. Others, including San
 411 Fransico Ballet, Arizona Ballet, Joffrey Ballet, and Houston Ballet, saw substantial investment gains
 412 over the years we analyzed. This has significant implications for the individual dancers employed by

413 these companies in terms of compensation opportunities as well as job security. A company that does
414 not earn investment income risks long-term operation deficits due to inflation and unforeseen expenses.
415 Therefore, it is important to continue to examine changes in endowments for dance companies over
416 time and clearly communicate these findings to the dance world.

417 *5.3. Employee and Volunteer Labor*

418 *5.3.1. By Geographical Region*

419 Overall, more labor (both volunteer and employee) is used in the West, followed by the
420 Mid-Atlantic, then the South, then the Midwest, then Mid-America, and finally New England. Of these
421 regions, the one with the highest proportion of companies who rely more on volunteer labor than
422 paid employees is the Midwest, followed by the West, then Mid-America, New England, and then
423 the Mid-Atlantic. This indicates that a few things could be happening in the world of dance. First, in
424 regions with high rates of volunteer labor, there may be a higher percentage of community engagement.
425 This is especially true for companies such as Eugene Dance in Oregon from the West region, which
426 reports a significant number of volunteers but generates significant community support for their
427 productions. Secondly, in regions with high rates of employee labor, state, and local governments
428 may subsidize compensation costs which increase companies' ability to hire and pay their employees.
429 Since dance is known to be an industry with a disproportionate amount of unpaid labor, it is especially
430 important to understand where and why these discrepancies occur.

431 *5.4. Compensation and Building Value*

432 We also examined the fraction of compensation going to senior executives (i.e. their C-Suite
433 employees) is generally consistent. Future research should track trends of executive compensation
434 throughout the pandemic. Additionally, the pattern of how dance companies use their building
435 endowment is inconsistent. Further investigation is required to fully understand why and how real
436 estate is used by these companies.

437 The wide-ranging impacts of these understandings may lead to greater awareness by unpaid
438 and underpaid laborers in dance, accountability for dance companies, and more equity in the dance
439 industry. We hope this work provides motivation for further investigation of dance companies' publicly
440 available 990 data to better understand the financial performance and decisions of dance companies,
441 as well as other companies in the performing arts.

442 **6. Limitations**

443 Our analyses were not without limitations. First, certain companies have discrepancies in their
444 End-of-Year and Beginning-of-Year balances. We used End-of-Year balances to calculate the percent
445 change in endowments of all dance companies, so some information may be misrepresented based
446 on these discrepancies. Additionally, data on a finer time scale, for example at the monthly time
447 scale rather than the yearly, would be more informative for studying how investments did over time;
448 however, 990 Forms only provide this data annually. Another limitation of this work is the analysis of
449 compensation. The Form 990 provides summarized information across total employees, along with
450 some information about compensation to C-Suite executives. However, we cannot tell directly from
451 this data which of these employees are dancers, and as such, we cannot tell how dancers are being
452 compensated relative to other employees. Finally, a significant number of companies did not report
453 their number of employees and/or their number of volunteers. This led to missing data that was
454 left out the geographical and unpaid labor analyses. Nine states (New Hampshire, Vermont, Kansas,
455 Wyoming, South Dakota, North Dakota, Montana, Hawaii, and Alaska) did not have any companies
456 in this analysis.

457 7. Future Research

458 Because the IRS is greatly behind on releasing Form 990s, we only have data from 2021 for a
459 smaller subset of companies, 29 companies in total. That said, the effect of the COVID-19 pandemic on
460 all trends we have examined here is a crucial area of future research. Because the federal government
461 issued billions of dollars in public subsidies, trends throughout the pandemic would be helpful
462 to identify whether these subsidies helped those intended. Similarly, we would like to see if the
463 COVID-19 pandemic has changed the way companies used and reported their building endowment
464 found in this study. Lockdown policies in each state might change how in-person performances were
465 held, and companies might shut down certain performance centers due to prolonged quarantine.
466 Therefore, future research on buildings' book values should be conducted after more data in 2021 and
467 2022 is uploaded. Yet, to date, no comprehensive analysis has been done on the wage gap in dance
468 throughout the pandemic. Once tax documents through 2022 are filed for these companies, future
469 research can examine how wages, income, operations, and unpaid labor at dance companies have
470 evolved throughout the pandemic.

471 **Acknowledgments:** The authors thank the support and mentorship of Dr. Lindsay Poirier, Andrew Hoekstra, and
472 Elizabeth Yntema.

473 **Conflicts of Interest:** The authors declare no conflict of interest.

474 Abbreviations

475 The following abbreviations are used in this manuscript:

476 DDP Dance Data Project
477 IRS Internal Revenue Service

478 © 2023 by the authors. Submitted to *Journal Not Specified* for possible open access publication
479 under the terms and conditions of the Creative Commons Attribution (CC BY) license
480 (<http://creativecommons.org/licenses/by/4.0/>).