Importing Pop Idols? Socioeconomic Consequences of K-pop Boom in the US

Jaerim Choi & Seoyoung Kwon

Yonsei University

The 17th Joint Economics Symposium of Six Leading East Asian Universities

Table of contents

1. Introduction
2. Background
3. Data
4. Empirical Framework
5. Impact on Performing arts industry
6. Heterogeneous effect by size
7. Sociological effects
8. Conclusion
9. Appendix

Introduction

Motivation

- A broad literature about the crucial role of media in shaping young people's beliefs, attitudes, and values.

Most looked at the effect of domestic media

Framing and cultivating the story of crime, Kort-Butler & Habecker (2018)
The effects of the media on body image, Holmstrom (2004)

- Will people react the same when media from other countries, not at all culturally or geographically close, is imported?
- Will imported media from other countries complement or replace domestic media?
- K-pop has grown very popular in the United States these days.

Motivation

Figure: Trends of over time

→ K-pop may negatively affect the US performing arts industry.

Literature review

- "Teaching through television: Experimental evidence on entrepreneurship education in Tanzania", Bjorvatn et al. (2020)
  "The Impact of Television Programmes on Teenage Career Aspirations: The 'MasterChef Effect'", Di Pietro (2016)
  $\rightarrow$ We looked at the **effect of foreign media on the local labor market**, while most papers looked at domestic media's outcomes.
- "Cultural preferences in international trade: Evidence from the globalization of Korean pop culture", Chang and Lee (2017)
  $\rightarrow$ We examine the impact of K-pop in more **smaller level**, and examines the **impact on the local industry**.

Background

K-pop's popularity in the US

U.S. Top CD Album Sales

	Artist	Title	Sales
1	**Taylor Swift**	*The Tortured Poets Department*	**1,068,000**
2	**TOMORROW X TOGETHER**	*Minisode 3: Tomorrow*	**190,000**
3	**ATEEZ**	*GOLDEN HOUR: Part 1*	**181,000**
4	**TWICE**	*With You-Th*	**158,000**
5	**Taylor Swift**	*1989 (Taylor's Version)*	**111,000**
6	**Stray Kids**	*ROCK-STAR*	**109,000**
7	**Beyoncé**	*Cowboy Carter*	**107,000**
8	**ENHYPEN**	*Orange Blood*	**97,000**
9	**Billie Eilish**	*Hit Me Hard and Soft*	**96,000**
10	**SEVENTEEN**	*Seventeen Best Album '17 Is Right Here'*	**90,000**

Geographic variance of music preference in US

Figure: Most popular music genre in the US

Geographic variance in performing arts industry

State	**Famous music genre**
New York	Genre: **punk rock**, **hip-hop**. Artists: **Beastie Boys, blondie, Boogie Down Productions.**
Louisiana	Genre: **jazz**, **blues**. Artists: **Louis Armstrong, The Dirty Dozen Brass Band, The Neville Brothers.**
Tennessee	Genre: **country, blues, soul, and rock 'n' roll.** Artists: **Taylor Swift, Elvis Presley, Roy Orbison, Jerry Lee Lewis, and Johnny Cash.**
California	Genre: **pop**. Artists: **Ariana Grande, Selena Gomez, Lady Gaga, Billie Eilish.**

Geographic variance in performing arts industry

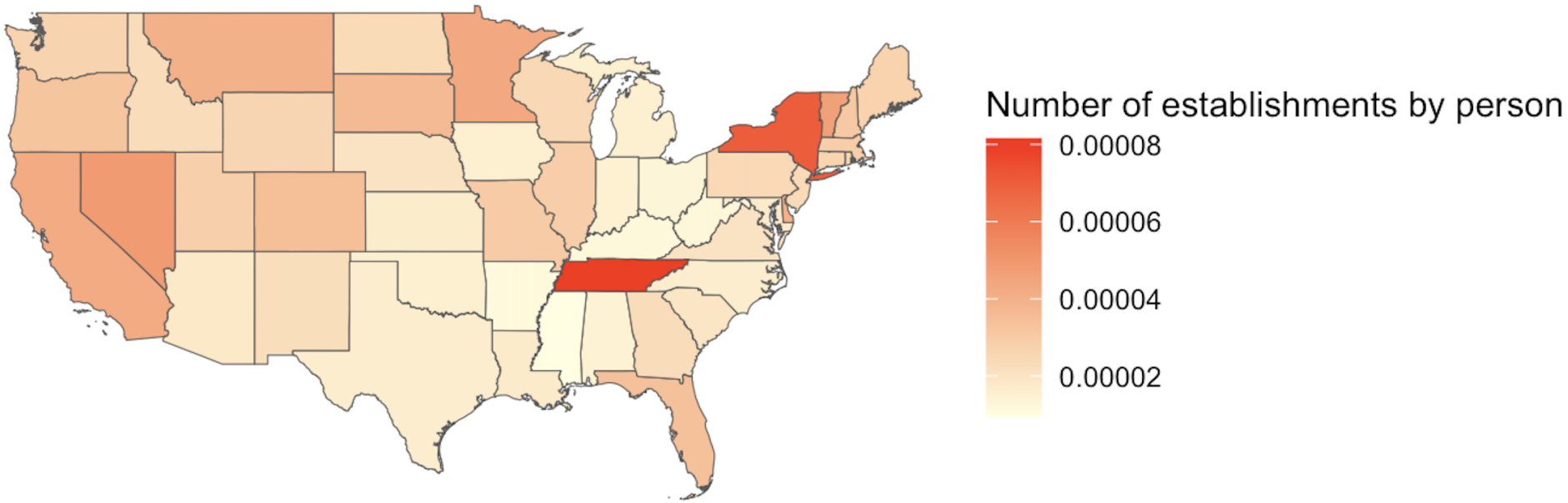


Figure: Performing arts industry variation

Data

Kpop popularity index

K-music index: made by using Google web searching data.
The 5 keywords we collected: K-pop, BTS, Black Pink, EXO, and TWICE.

$$Y_{mt} = \sum_k Interest_{kmt} * \frac{MRatio_{kmt}}{\sum_k MRatio_{kmt}} * \frac{PRatio_{kt}}{\sum_t PRatio_{kt}}$$

- Y_{mt}: The K-music index for metropolitan m at year t.
- $Interest_{kmt}$: The interest of keyword k for metropolitan m at year t.
- The middle term: The ratio of how much keyword k takes up the total ratio of metropolitan m in year t.
- Last term: The percentage of keyword k, in year t divided by the total period.

5 keyword popularity change over time

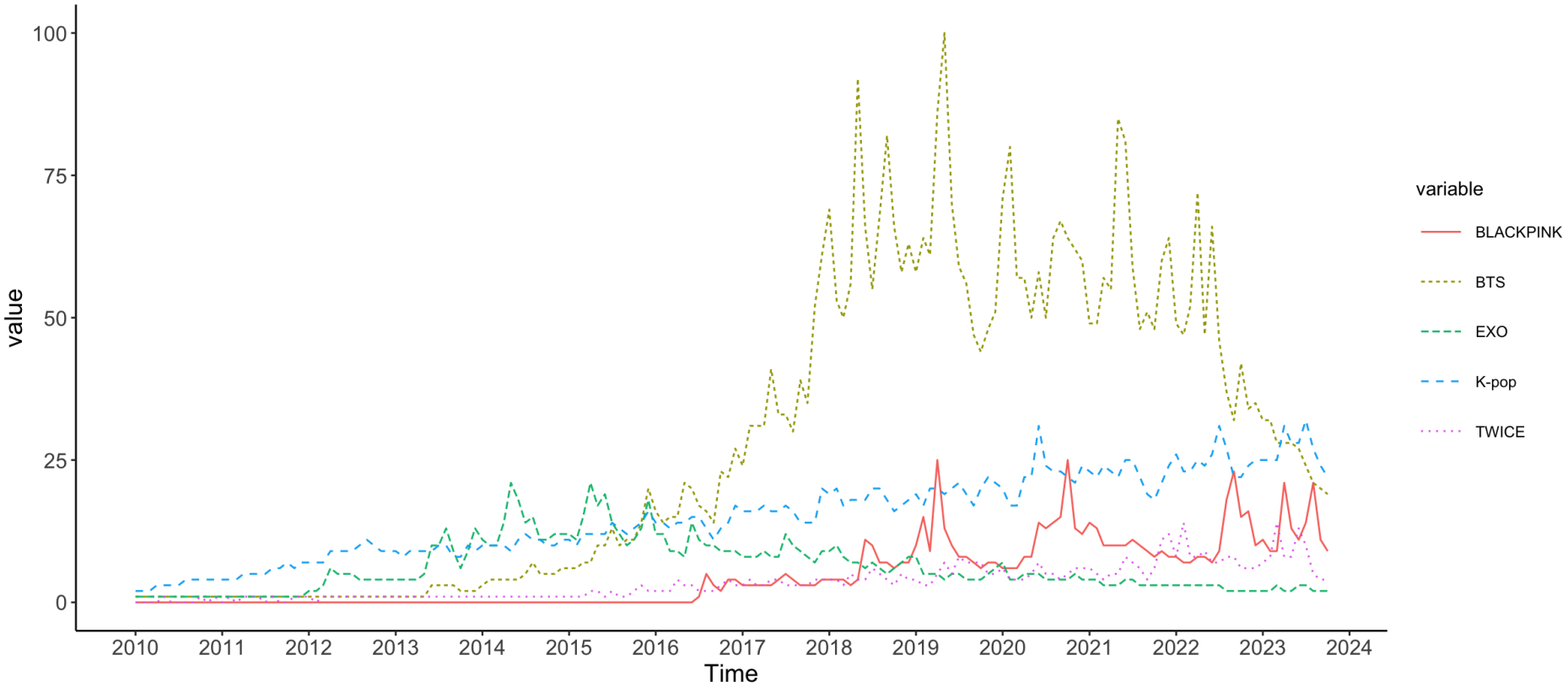
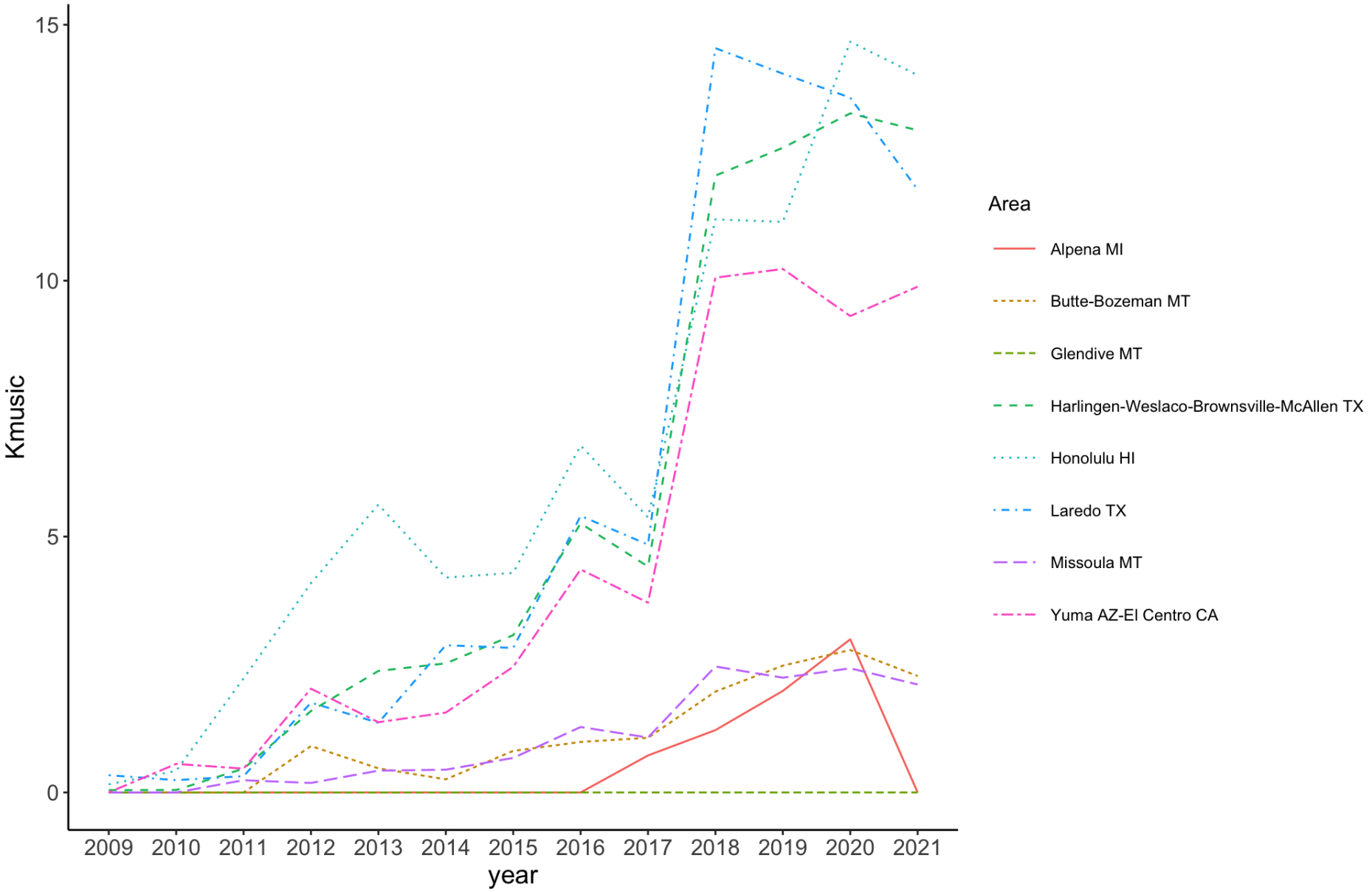


Figure: 5 keyword popularity change over time

K-music index change over time



Industry data

- County Business Patterns(CBP): 2009-2021 (Main: 2015 – 2021)
  - Regional economic information on businesses with paid staff.
  - Collected at the metropolitan level about the Performing Arts industry, NAICS 7111.
  - Establishments primarily engaged in producing live presentations involving the performances of actors and actresses, singers, dancers, musical groups, artists, etc.

Empirical Framework

Empirical Approach-OLS

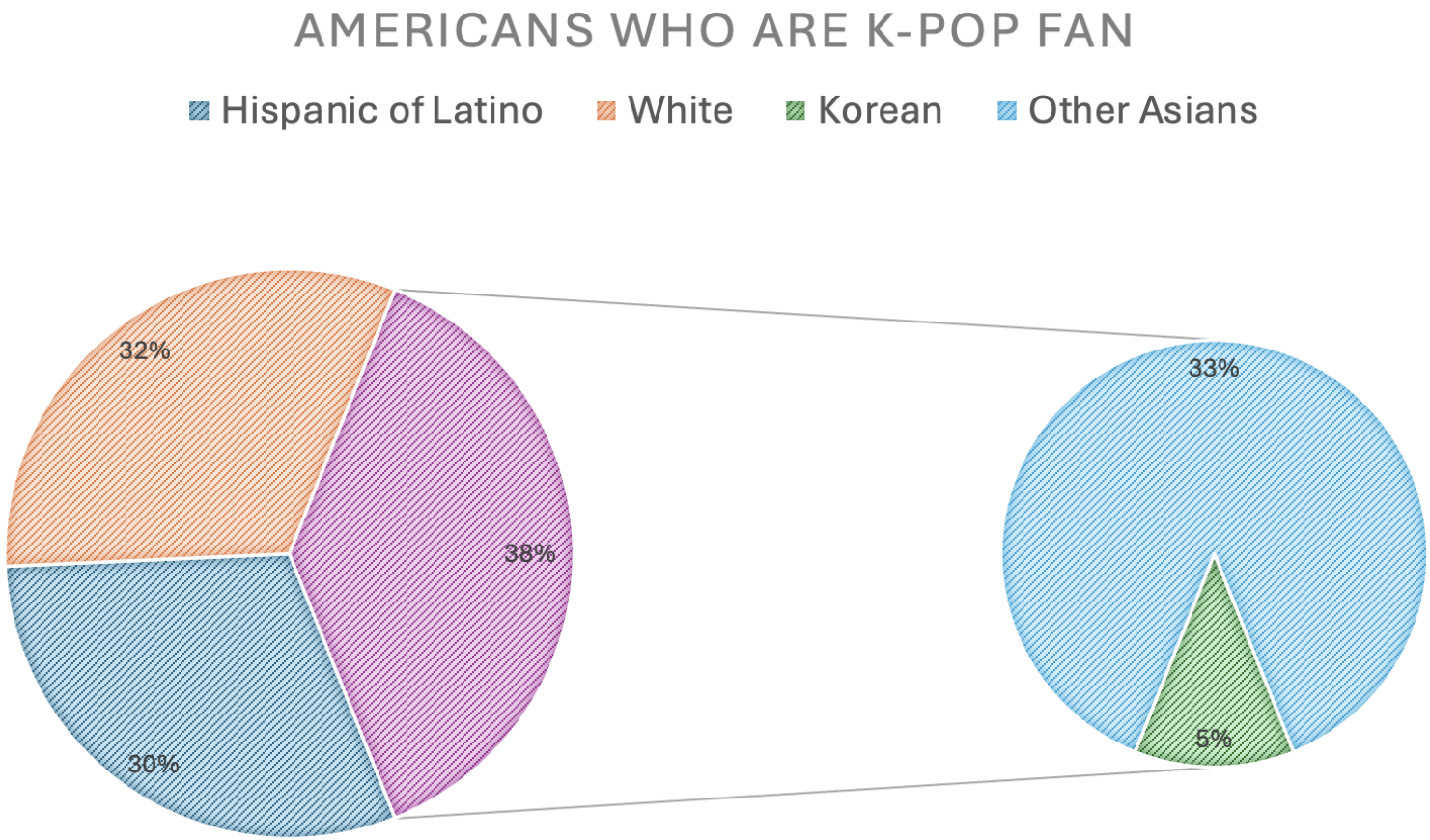
OLS:

$$\Delta Y_{i,t} = \alpha + \beta \Delta Kmusic_{i,t} + T_t + X_i + \varepsilon_{i,t}$$

- i: metropolitan
- $\Delta Y_{i,t}$: growth rate of the number of establishments, annual payroll, number of employees between year t and 2015.
- $\Delta Kmusic_i$: Kmusic index difference between year t and 2015.
- T_t: Time fixed effect.
- X_i: Predetermined control variables. ex) 2015 employment rate, 2015 log median income.

$\rightarrow$ The performing arts industry comprises the American music industry, it may be correlated with the K-pop interest.

Using Asian ratio to make an instrument



Notes: Consumer Research Report on Korean Contents in the US Market by the Korea Creative Content Agency

Constructing Shift Share IV

Using the similar method of constructing Immigrant Shift share IV, following Card (2009), we predict the K-music index difference in metropolitan i in year t as follows:

$$\tilde{Asian}_{it} = \sum_{B} \frac{M_{Bit^0}}{M_{Bt^0}} \frac{\Delta M_{Bt}}{L_{it-1}}$$

- $\frac{M_{Bit^0}}{M_{Bt^0}}$: share of Asians from the birthplace B in metropolitan i at reference date t^0 that predates t. In our case, we used t^0=2010.
- ΔM_{Bt}: the increase in the number of Asians from that birthplace B at time t at the national level.
- L_{it-1}: local population in the previous period. In our case, 2015 population.

Empirical Approach-IV

Second stage:

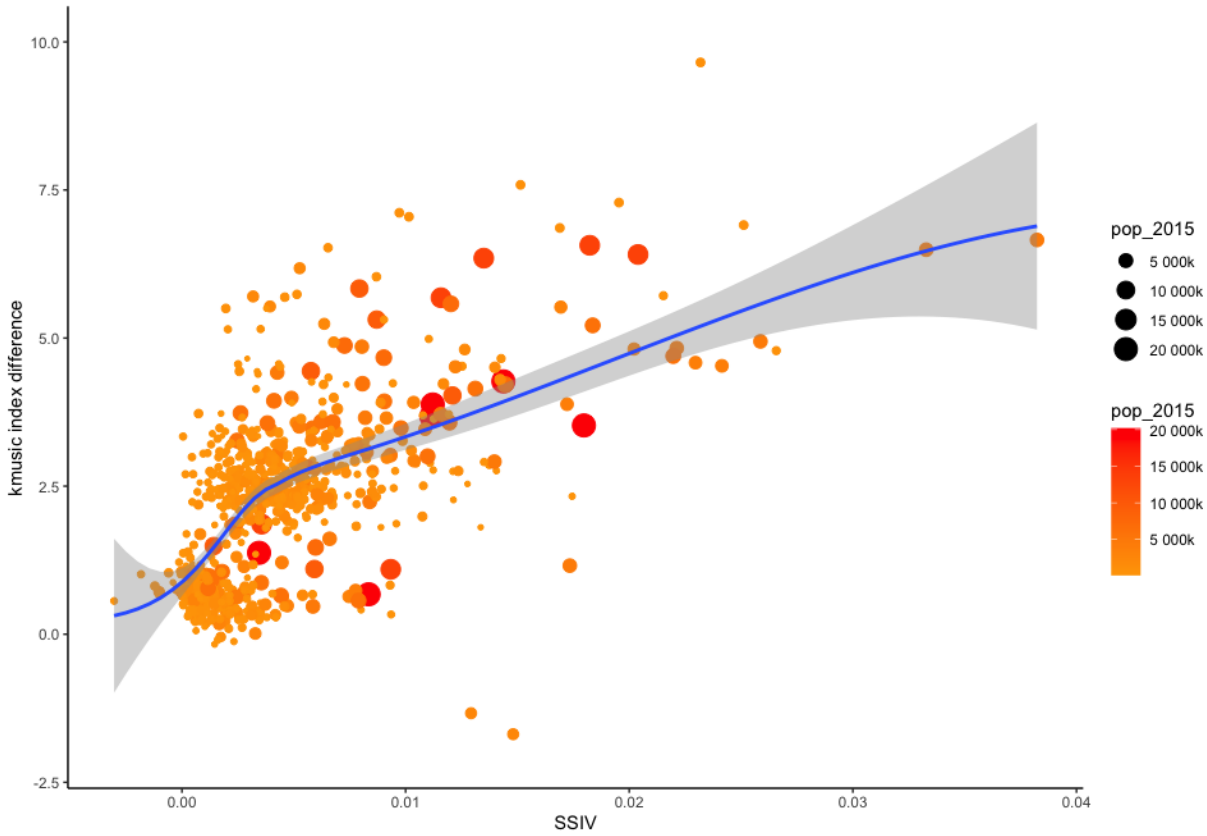
$$\Delta Y_{i,t} = \alpha + \beta \Delta \hat{Kmusic}_{i,t} + T_t + X_i + \varepsilon_{i,t}$$

First Stage:

$$\Delta \hat{Kmusic}_{i,t} = \gamma + \delta \tilde{Asian}_{it} + T_t + X_i + \epsilon_{i,t}$$

- i: metropolitan
- $\Delta Y_{i,t}$: growth rate of the number of establishments, annual payroll, number of employees between year t and 2015.
- $\Delta Kmusic_{i,t}$: Kmusic index difference between year t and 2015.
- T_t: Time fixed effect.
- X_i: Predetermined control variables. ex) 2015 employment rate, 2015 log median income.
- $\tilde{Asian}_{it}$: Asian Shift-Share Instrument variable.

Correlation of Asian SSIV and K-music index increase



- First stage F-stat: 208.

Impact on Performing arts industry

Results

	Δ Establishments (#)	Δ Payroll (amt)	Δ Employ (#)	Δ Establishments (#)	Δ Payroll (amt)	Δ Employ (#)
	(1)	(2)	(3)	(4)	(5)	(6)
		OLS			2SLS	
kmusic	0.0035	-0.035***	-0.041***	0.00997	-0.053***	-0.077***
	(0.00357)	(0.0066)	(0.012)	(0.00662)	(0.0122)	(0.0227)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Num. obs.	777	777	777	719	719	719
R-squared	0.037	0.200	0.149	0.032	0.203	0.137

Notes: All regressions were weighted by metropolitan population.

- Twice $\uparrow$ in K-pop popularity $\rightarrow$ $-0.085\%p \downarrow$ in annual payroll and $-0.12\%p \downarrow$ in employment.

Robustness check

- For the robustness check, we changed the ΔY_i to other years and see if the negative shock stays steady. Robustness
- For the pre-trend check, we changed the dependent variables to values of years between 2009 and 2015.
  Pretrend
- For the placebo test, we changed the dependent variables to the Educational Services industry values, NAICS code 61.
  Placebo

Heterogeneous effect by size

Data

- For small artists, we used the County Business Patterns data (CBP) about industry 711510, which includes Independent Artists, Writers, and Performers.
- For big artists, we collected Google web search data based on the Billboard Decade-end charts and constructed a pop music index.

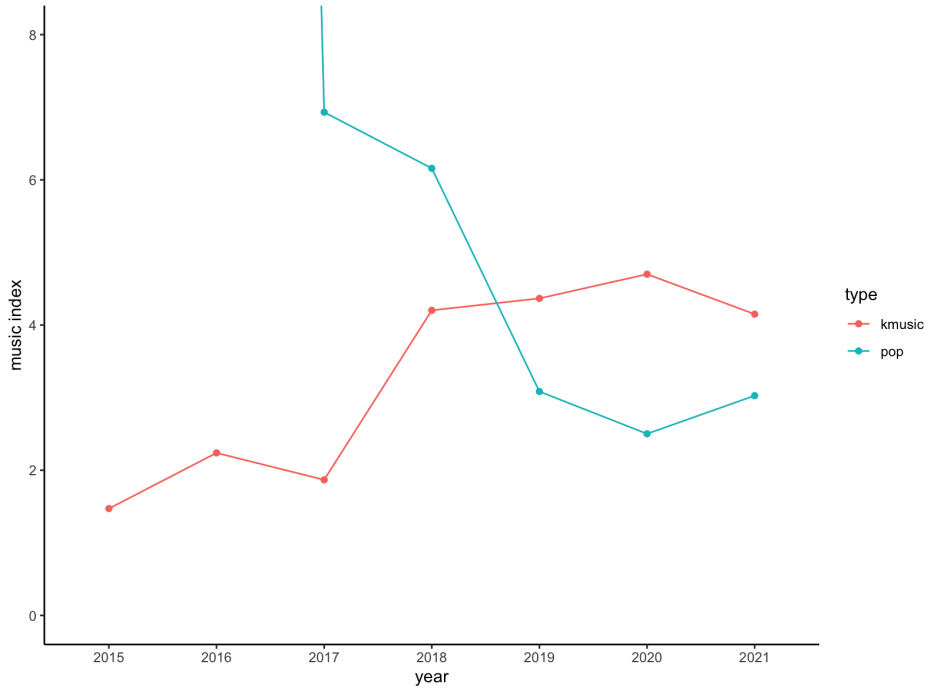


Figure: Comparing Kmusic index with pop music index

Effect on artists by size - IV results

	Δ Establishments (#) (1)	Δ Payroll (amt) (2)	Δ Employ (#) (3)	Δ Pop index (4)
Size:		Independent Artists		Popular Artists
kmusic	0.0272***	-0.0845	-0.101***	-2.403
	(0.00964)	(0.0628)	(0.0311)	(2.723)
Control	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Num. obs.	781	781	781	906
R-squared	0.265	0.042	0.039	0.072

Notes: All regressions were weighted by metropolitan population.

- Twice ↑ in K-pop popularity → $-0.16\%p$ ↓ in employment for independent artists.
- Twice ↑ in K-pop popularity → 70% ↓ in pop music popularity for popular artists.

Sociological effects

K beauty index data

K-Beauty Index:

$$Y_{mt} = Interest_{mt} * \frac{PRatio_t}{\sum_t PRatio_t}$$

- Y_{mt}: K beauty index for metropolitan m at year t.
- $Interest_{kmt}$: The interest of keyword k beauty for metropolitan m at year t.
- The last term: Percentage of keyword k beauty, in year t divided by the total period.

$\rightarrow$ K beauty index is a Korean beauty interest index weighted by region and time.

Analysis-IV

Second Stage :

$$\Delta Y_i = \alpha + \beta \Delta \hat{Kmusic}_i + \Delta Asian_i + \varepsilon_i$$

- ΔY_i: Differentiation in the K beauty index of metropolitan i.
- $\Delta Kmusic_i$: Differentiation of the K-music index of metropolitan i.
- $\Delta Asian_i$: Differentiation of the Asian population.

First Stage:

$$\Delta \hat{Kmusic}_i = \gamma + \delta \tilde{Asian}_i + \Delta Asian_i + \epsilon_i$$

- $\tilde{Asian}_i$: Asian SSIV of metropolitan i.

Results

Table: The impacts of the K-music index on the K-beauty index

	K-beauty difference (1)	K-beauty difference (2)	K-beauty difference (3)
kmusic difference	0.678***	0.307***	0.593***
	(0.108)	(0.108)	(0.135)
Increase in Asian population		1.22e-05***	
		(2.49e-06)	
Increase in Asian ratio			18.77
			(21.13)
Constant	-0.892**	-0.0424	-0.693
	(0.398)	(0.339)	(0.424)
Observations	150	150	150
R-squared		0.319	

- Twice ↑ in K-pop popularity → 3.3 times ↑ in K-beauty popularity.

Inter-marriage rate data

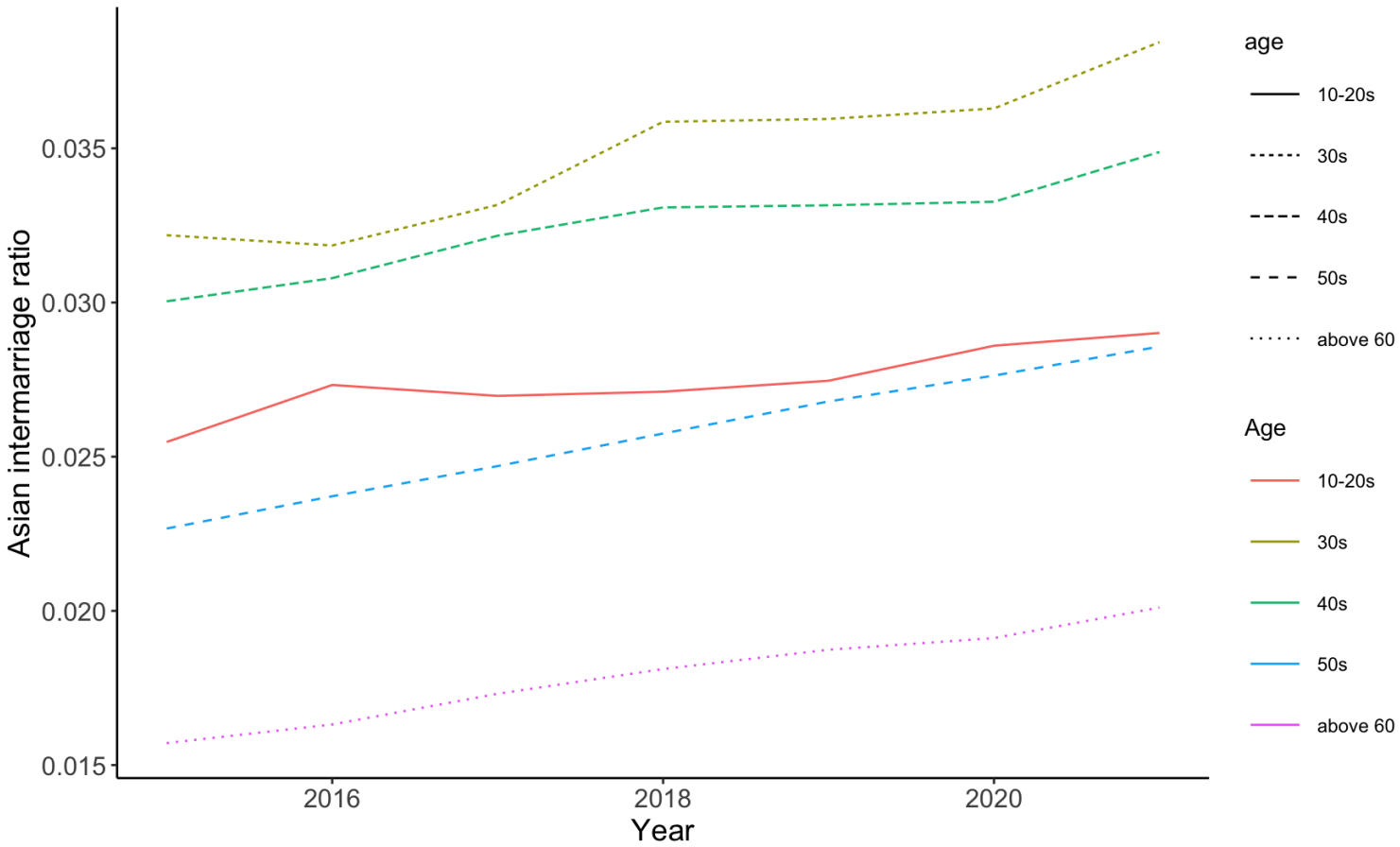


Figure: Asian intermarriage change over time

$\rightarrow$ Tried to see whether the change in preferences has also affected the marriage market.

Analysis-IV

Second Stage:

$$\Delta Y_i = \alpha + \beta \Delta \hat{Kmusic}_i + \Delta Asian_i + \epsilon_i$$

- ΔY_i: Change in Asian intermarriage rate in metropolitan i.
- $\Delta \hat{Kmusic}_i$: Change in K-music index in metropolitan i.
- $\Delta Asian_i$: Change of Asian ratio in metropolitan i.

First stage:

$$\Delta \hat{Kmusic}_i = \gamma + \delta \tilde{Asian}_i + \Delta Asian_i + \varepsilon_i$$

- $\tilde{Asian}_i$: Asian SSIV of metropolitan i.

Results

Table: The impact of K-music index on the Asian inter-marriage rate

	Intermarriage ratio (1)	Intermarriage ratio (2)
kmusic difference	0.00226***	0.00258***
	(0.000464)	(0.000634)
Increase in Asian Ratio		-0.0717
		(0.0990)
Constant	-0.00270	-0.00346*
	(0.00171)	(0.00199)
Observations	150	150

- Twice ↑ in K-pop popularity → 23% ↑ in Asian intermarriage rate.

Conclusion

Conclusion

- Rising popularity of K-pop had a significant negative impact on the local labor market of the US performing arts industry. Effects were stronger for small artists.
- K-pop also increased interest in K-beauty and increased the Asian intermarriage rate.
- Showed that foreign media, even if it's not culturally close, can affect people's attitudes and change their taste in dating and marriage.
- Found that the other country's media works as a substitute for domestic media, but not entirely.

Thank you!

Questions?

Appendix

Appendix - Roubustness check: Comparing coefficients

We changed the dependent variable to growth rate between 2020 and 2015, 2019 and 2015, 2018 and 2015, 2017 and 2015, and 2016 and 2015.

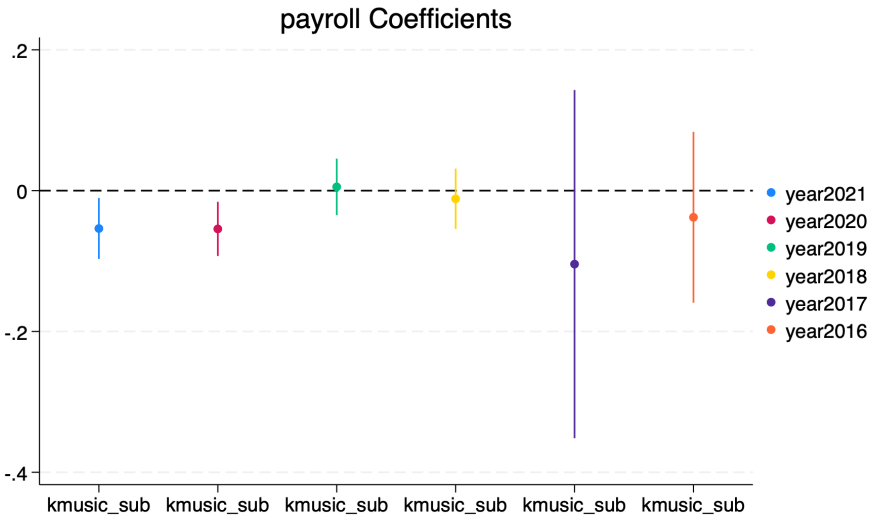


Figure: Payroll coefficient comparison

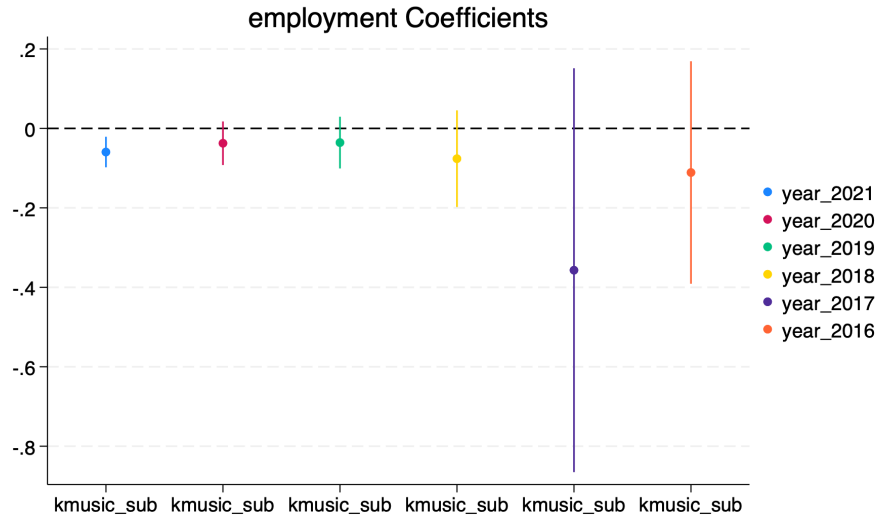


Figure: Employment coefficient comparison

We can see that the coefficients have similar values, and they are all below zero. return

Appendix - Pretrend check

Table: The impacts of K-music index on the US performing arts industry

	Estab growth rate (1)	pay growth rate (2)	employ growth rate (3)	Estab growth rate (4)	pay growth rate (5)	employ growth rate (6)
kmusic difference	-0.0164	-0.0326	0.0418	-0.0114	0.0104	0.0796
	(0.0224)	(0.0638)	(0.0679)	(0.0223)	(0.0611)	(0.0647)
log(median income)				-0.209	-0.457	0.0935
				(0.179)	(0.501)	(0.533)
employment rate				0.997	0.253	-3.293
				(0.769)	(2.261)	(2.427)
Constant	0.107	0.339	-0.0205	1.597	4.665	0.929
	(0.0760)	(0.219)	(0.234)	(1.464)	(4.063)	(4.325)
Observations	119	98	87	119	98	87
R-squared	0.019			0.030	0.019	0.012

return

Appendix - Placebo test

Table: The impacts of K-music index on the US educational services industry

	establishment growth rate (1)	payroll growth rate (2)	employ growth rate (3)
kmusic difference	0.0187***	0.0238*	-0.00948
	(0.00665)	(0.0139)	(0.00998)
log(median income)	-0.173**	-0.250*	-0.278***
	(0.0701)	(0.147)	(0.105)
employment rate	0.764**	0.977	0.965**
	(0.321)	(0.673)	(0.482)
Constant	1.305**	2.098*	2.224***
	(0.572)	(1.200)	(0.859)
Observations	136	136	136
R-squared	0.157	0.082	0.000

return

Appendix - Reduced form results

Table: The impacts of K-music index on US performing arts industry

	$\Delta Establishment(\#)$	$\Delta Payroll(amt)$	$\Delta Employment(\#)$	$\Delta Establishment(\#)$	$\Delta Payroll(amt)$	$\Delta Employment(\#)$
	(1)	(2)	(3)	(4)	(5)	(6)
SSIV	-0.703	-12.34***	-11.82***	0.887	-10.45***	-11.71***
	(2.203)	(3.759)	(3.326)	(2.341)	(3.960)	(3.566)
Control	No	No	No	Yes	Yes	Yes
Num. obs.	119	119	119	119	119	119
R-squared	0.001	0.084	0.097	0.044	0.139	0.121

Appendix - Summary Statistics

Table: Main estimation summary statistics

Variables	N	Min	Mean	Median	Max	St. Dev.
2021 number of establishments	719	2	54.855	15	1,508	160.870
2015 number of establishments	719	3	52.389	14	1,392	153.390
Establishment growth rate	719	−0.556	0.028	0.000	0.875	0.196
2021 annual payroll	719	0	28,620.910	3,981	1,248,293	101,257.500
2015 annual payroll	719	41	30,408.670	3,756	1,110,988	111,117.000
Annual payroll growth rate	719	−1.000	0.043	0.025	6.702	0.464
2021 Employment	719	0	748.320	193	22,929	2,102.828
2015 Employment	719	3	810.858	215	21,545	2,254.824
Employment growth rate	719	−1.000	0.065	−0.011	15.500	1.062
2021 kmusic index	719	1.170	3.776	3.671	14.668	1.727
2015 kmusic index	719	0.676	1.609	1.345	12.080	1.213
kmusic index difference	719	−9.927	2.167	2.362	10.378	1.863
2015 population	719	120,106	1,626,730.000	730,250	20,182,305	2,598,264.000
SSIV	719	−0.003	0.005	0.003	0.038	0.005
2015 employment rate	719	0.466	0.597	0.593	0.688	0.042
2015 median income	719	15,000	23,134.140	23,000	39,000	3,706.529

Appendix - Kmusic index variation

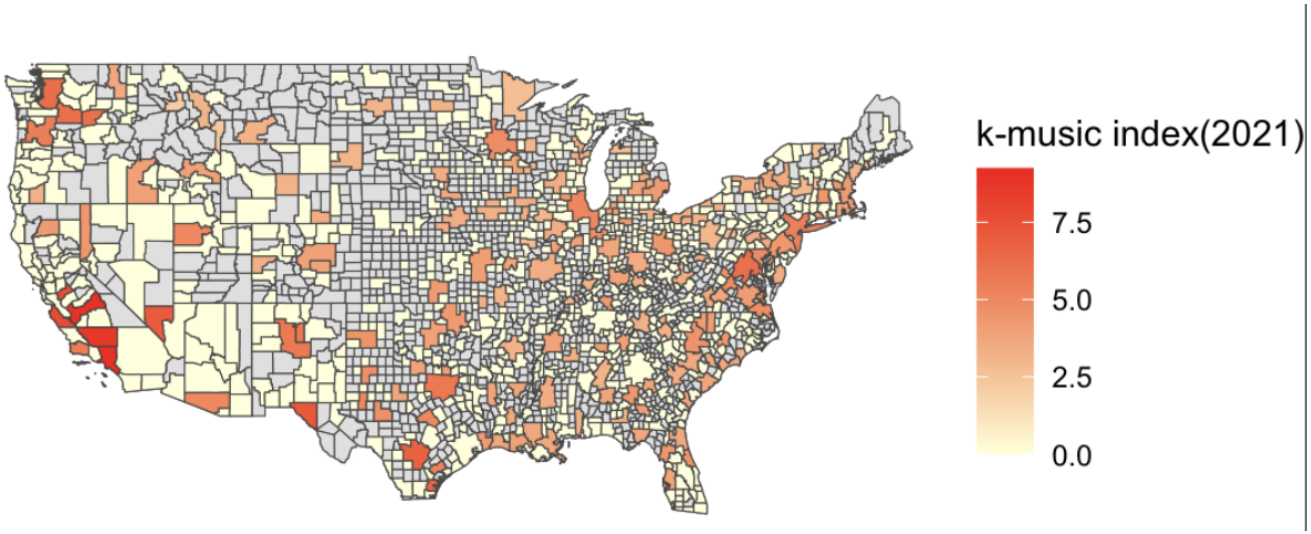


Figure: K-music index variation by metropolitan in America

Notes: This figure is the map of K-music index variation by the US metropolitan of the year 2021. The gray areas are non-metropolitan areas, which are missing values.

Appendix - log differentiation results: OLS

Table: The impacts of K-music index on the US performing arts industry

	estab	payroll	employment	estab	payroll	employment
	(1)	(2)	(3)	(4)	(5)	(6)
kmusic difference	0.0115	-0.0529***	-0.0624***	0.00447	-0.0641***	-0.0780***
	(0.00831)	(0.0164)	(0.0200)	(0.00968)	(0.0181)	(0.0228)
log(median income)				-0.233	-1.325***	-1.243***
				(0.148)	(0.277)	(0.348)
employment rate				0.692	3.689***	4.738***
				(0.661)	(1.238)	(1.555)
Constant	0.0205	-0.00893	-0.442***	1.976	11.15***	9.272***
	(0.0314)	(0.0620)	(0.0755)	(1.213)	(2.272)	(2.854)
Observations	165	165	165	128	128	128
R-squared	0.012	0.060	0.057	0.024	0.210	0.146

Appendix - log differentiation results: IV

Table: The impacts of K-music index on the US performing arts industry

	Estab	Pay	Employ	Estab	Pay	Employ
	(1)	(2)	(3)	(4)	(5)	(6)
kmusic difference	0.000841	-0.108***	-0.137***	0.00708	-0.0723***	-0.118***
	(0.0154)	(0.0322)	(0.0394)	(0.0143)	(0.0269)	(0.0345)
log(median income)				-0.225	-1.337***	-1.322***
				(0.151)	(0.285)	(0.366)
employment rate				0.609	3.724***	5.089***
				(0.694)	(1.309)	(1.677)
Constant	0.0653	0.178	-0.182	1.948	11.28***	9.999***
	(0.0561)	(0.118)	(0.144)	(1.237)	(2.332)	(2.989)
Observations	119	119	119	119	119	119
R-squared	0.001	0.007	0.002	0.022	0.215	0.132