Assessing the Impact of Incentives for the Entertainment Industry on Employment Growth:
A Cross-State Analysis

Ric Kolenda, Georgia State University and Georgia Institute of Technology
rkolenda1@gsu.edu • ric@gatech.edu

Data and Methodology

The data used was a combination of state-by-state MPI levels for the years 2002-2010 and employment and establishment data for the same years.

Movie Production Incentives Data

The collection of MPI data was a bit of a challenge. While several sources offer up-to-date web-based information, either individually at state film commission web sites or aggregators of current information (Motion Picture Association of America, 2012; National Conference of State Legislatures, 2011) or that collected at an often-unspecified point in time (Harper, 2009; Luther, 2010), getting good data over several years was surprisingly difficult. In addition to the above sources, I spent a good deal of time finding and reading enabling legislation, much of which lacks good information on changes over time, and news articles about the passage of and/or amending of MPI legislation. In the end I have a complete set of data from 2002 to 2010, though it is possible that data from few states and/or years could have fallen through the cracks of my rather holey dragnet. I am engaged in an ongoing process of updating this data, as well as managing it in years subsequent to those represented in this paper.

The next challenge was determining what rate to use, since many states offer a variety of incentives based on specific criteria. For this paper, I chose to use only one rate: that of the state income tax credit or rebate for general expenditures. This means I did not include add-ons for local hiring, expenditures in economically troubled areas of a state, variations of rates based on total expenditure or production type, or a handful of others. I did, however add credits that were both applied to general expenditures and relatively easy to get. One notable example is the extra ten-percent credit offered by Georgia for adding an animated logo to the credits of a production.

Ten states and the District of Columbia had no fixed, funded tax incentive for film production, and since these states also had low film industry concentration, making them less than ideal control observations, they were dropped from the data set. Table 1 shows the 22 states in the final sample with their MPIs by year.

Employment and Establishment Data

For the employment and establishment data, I used the County Business Patterns (CBP), an annual series of national and subnational economic data by industry. The number of establishments and employment is reported from the week of March 12. While this single point in time might be a problem for some inquiries, in this case it might be advantageous, because while film production takes place throughout the year, the winter months are more likely to reflect more permanent patterns of employment, rather than seasonal booms in the more temperate times of the year. This also makes it somewhat more likely that film industry workers will be employed in their state of residence.

To measure data specifically for the motion picture industry, I chose to use the single four-digit NAICS code of 5121, "Motion Picture and Video Industries." Unfortunately, around half of this category nationally is employed in the exhibition portion of the industry. The reason for choosing this category was that much of the data for the appropriate subcategories was suppressed, therefore making it difficult to get enough observations for meaningful analysis.

One concern with this data is that many values, especially in areas of smaller employment numbers, are suppressed for reasons of confidentiality. This was even true, as it turned out, for relatively highly aggregated cells at the state and 4-digit NAICS levels. Therefore, in addition to the 11 observations dropped due to lack of MPIs, another 12 were dropped due to lack of employment data. Observations were dropped if either more than 3 years total or two or more consecutive years were unavailable. After this, there remained five states with one or two missing employment data: Iowa, Massachusetts, Oregon, Utah and Washington. These missing values were imputed using the midpoint of the employment flags given in the CBP data. Tables 2 and 3 show employment and establishment growth from 2002 to 2010 for the 22 states in the remaining sample.

Hypothesis

Based on the literature and the policy logic models that favor MPIs, I would hypothesize that offering MPIs will increase film industry employment and establishments in the states that offer them, and further, that higher MPI rates mean greater growth. To test these hypotheses I will use a combination of descriptive and linear regression models.

Descriptive Statistics

After culling the states with no tax credits and suppressed employment values, I was left with 22 states for my analysis. Since my goal is to look at long-term growth in the motion picture industry, I chose to report primarily on the net changes between the base year (2002) and the final year for which I have data (2010). For a few cases, I do show annual changes as well.

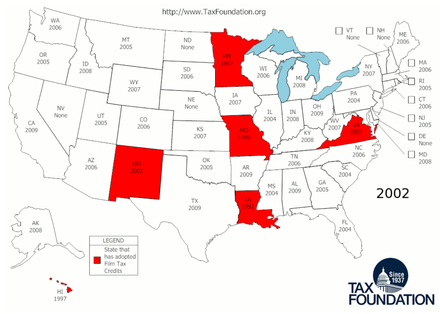
Regression analysis

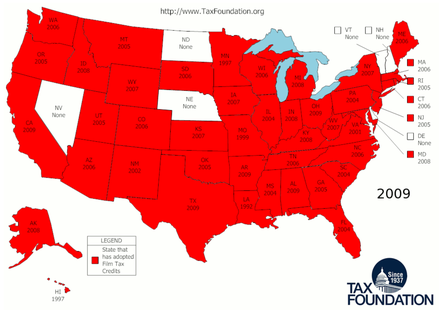
Again, since I am looking at long-term employment growth, for this paper I chose to use cross-sectional ordinary least squares regression on employment growth over the entire period with MPIs in effect. The dependent variables used are the employment growth rate for the motion picture industry between 2002 and 2010, using NAICS 5121 "Motion Picture and Video Industries."

I began by attempting a simple model, using the employment growth of the state's motion picture industry as the dependent variable, and the weighted average of the MPI level for all nine years as the primary independent variable, with the state's overall employment growth as a control variable , and using robust standard errors to account for heteroskedasticity.

The second model used transformations of the variables from the first. This time I used the weighted average annual employment growth for the state's film industry as the dependent variable, controlling for the same transformation of the state's overall employment growth, and again using the weighted average MPI rate as the primary independent variable.

Growth of MPIs by State 2002-2009





State Motion Picture Incentives, 2002-2010

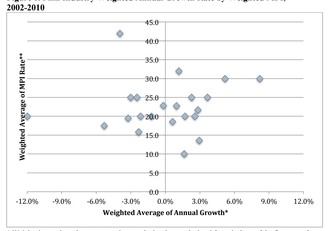
Table 1. State Motion Picture Incentives, 2002-2010

State	2002	2003	2004	2005	2006	2007	2008	2009	2010	Wt. Avg.	MPI Avg.
Arizona			20	20	20	20	20	20	20	15.6	20.0
California								20	20	4.4	20.0
Colorado					10	10	10	10	10	5.6	10.0
Florida			20	20	20	20	20	20	20	15.6	20.0
Georgia				9	9	9	30	30	30	13.0	19.5
Illinois								30	30	6.7	30.0
Iowa						25	25	25	25	11.1	25.0
Louisiana	15	15	15	25	25	25	25	30	30	22.8	22.8
Maryland						25	25	25	25	11.1	25.0
Massachusetts					25	25	25	25	25	13.9	25.0
Michigan							42	42	42	14.0	42.0
Minnesota					25	25	25	25	25	13.9	25.0
New Jersey					20	20	20	20	20	11.1	20.0
New York			10	10	10	10	30	30	30	14.4	18.6
N. Carolina					8.1	15	15	15	15	7.6	13.6
Oklahoma				15	15	15	15	35	35	14.4	21.7
Oregon				20	20	20	20	20	20	13.3	20.0
Pennsylvania			20	20	20	25	25	25	25	17.8	22.9
Tennessee					32	32	32	32	32	17.8	32.0
Texas								17.5	17.5	3.9	17.5
Utah				15	15	15	15	15	20	10.6	15.8
Washington					30	30	30	30	30	16.7	30.0

Source: Author's compilation of state data

Film Industry Annual Growth Rate by MPI, 2002-

Figure 1. Film Industry Weighted Annual Growth Rate by Weighted MPI, 2002-2010



* Weighted annual employment growth rate calculated was calculated from the base of the first year of MPI to 2010, using the formula:

$$r = \ln(p_t / p_1) / n,$$

where p_t & p_1 are the last and first year MPIs were active respectively, and n = the number of years in which MPIs were in effect, using a one-year lag.

** Weighted average of MPI calculated by the MPI rate for the years in effect

Employment Growth by State, 2002-2010

Table 3. Establishment Growth by State, 2002-2010

State	Motion Picture Establishment Growth 2002	2010	Net	Growth	All Establishment Growth 2002	2010	Net	Growth	Growth Difference
OR	199	246	47	23.6%	101,933	107,397	5,464	5.4%	18.26
GA	398	478	80	20.1%	206,323	217,099	10,776	5.2%	14.88
LA	116	130	14	12.1%	101,885	103,365	1,480	1.5%	10.62
OK	143	161	18	12.6%	86,029	90,050	4,021	4.7%	7.91
IA	149	159	10	6.7%	81,042	80,801	-241	-0.3%	7.01
NY	2,292	2,502	210	9.2%	498,921	519,504	20,583	4.1%	5.04
MA	357	357	0	0.0%	175,991	169,790	-6,201	-3.5%	3.52
TN	258	265	7	2.7%	130,556	131,582	1,026	0.8%	1.93
MI	423	397	-26	-6.1%	237,616	219,119	-18,497	-7.8%	1.64
NC	335	356	21	6.3%	207,562	218,104	10,542	5.1%	1.19
FL	1,002	1,103	101	10.1%	450,188	491,150	40,962	9.1%	0.98
CA	6,245	6,519	274	4.4%	820,997	849,875	28,878	3.5%	0.87
NJ	429	415	-14	-3.3%	237,505	228,937	-8,568	-3.6%	0.34
WA	358	378	20	5.6%	165,933	175,914	9,981	6.0%	-0.43
PA	465	458	-7	-1.5%	297,257	297,023	-234	-0.1%	-1.43
MN	351	349	-2	-0.6%	143,953	145,464	1,511	1.0%	-1.62
TX	780	829	49	6.3%	482,169	522,146	39,977	8.3%	-2.01
CO	351	367	16	4.6%	142,247	151,973	9,726	6.8%	-2.28
IL	690	680	-10	-1.4%	309,980	314,171	4,191	1.4%	-2.80
UT	206	233	27	13.1%	58,788	68,820	10,032	17.1%	-3.96
MD	285	274	-11	-3.9%	131,815	134,579	2,764	2.1%	-5.96
AZ	216	222	6	2.8%	119,740	131,849	12,109	10.1%	-7.33
US	19,652	20,296	644	3.3%	7,200,770	7,396,628	195,858	2.7%	0.56

Source: County Business Patterns

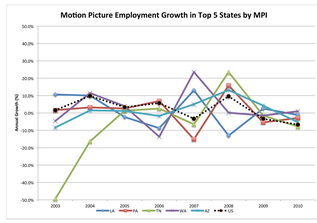
Establishment Growth by State, 2002-2010

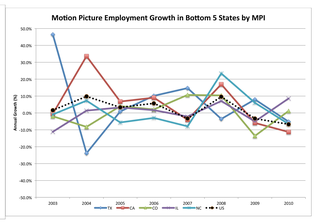
Table 2. Employment Growth by State, 2002-2010 (in thousands)

ST	Motion Picture Employment Growth 2002	2010	Net	Growth	All Employment Growth 2002	2010	Net	Growth	Growth Difference
CA	86.70	125.73	39.03	45.0%	12,856.43	12,536.40	-320.02	-2.5%	47.51
TX	11.15	15.65	4.51	40.4%	7,993.56	8,785.24	791.68	9.9%	30.53
OK	1.66	1.99	0.33	19.8%	1,200.48	1,241.17	40.69	3.4%	16.41
NY	21.43	24.13	2.70	12.6%	7,234.92	7,266.19	31.27	0.4%	12.15
NC	3.98	4.36	0.38	9.5%	3,322.00	3,234.60	-87.41	-2.6%	12.15
MA	3.81	4.11	0.30	7.8%	3,023.13	2,928.55	-94.58	-3.1%	10.98
WA	3.93	4.62	0.68	17.4%	2,185.66	2,326.73	141.07	6.5%	10.95
OR	2.60	2.88	0.29	11.0%	1,329.24	1,351.16	21.93	1.6%	9.36
LA	1.63	1.77	0.13	8.1%	1,583.31	1,599.55	16.24	1.0%	7.05
IL	8.99	9.18	0.19	2.1%	5,224.29	4,980.01	-244.28	-4.7%	6.77
IA	1.67	1.80	0.13	7.5%	1,229.61	1,253.10	23.49	1.9%	5.57
PA	6.08	6.31	0.23	3.8%	5,046.44	4,976.19	-70.25	-1.4%	5.16
AZ	3.64	3.95	0.31	8.4%	1,945.47	2,065.22	119.75	6.2%	2.27
UT	2.67	3.03	0.36	13.5%	900.43	1,021.14	120.72	13.4%	0.06
CO	4.12	4.20	0.08	2.0%	1,912.15	1,955.34	43.18	2.3%	-0.24
MI	6.18	5.16	-1.02	-16.5%	3,889.83	3,288.46	-601.37	-15.5%	-1.07
MN	4.09	3.85	-0.24	-5.8%	2,359.59	2,357.97	-1.62	-0.1%	-5.78
MD	3.27	3.09	-0.18	-5.4%	2,062.52	2,075.51	12.99	0.6%	-6.05
FL	10.96	10.68	-0.28	-2.6%	6,366.96	6,626.56	259.59	4.1%	-6.65
NJ	5.70	4.89	-0.82	-14.3%	3,596.92	3,367.17	-229.75	-6.4%	-7.93
GA	6.48	5.08	-1.41	-21.7%	3,381.24	3,315.27	-65.97	-2.0%	-19.74
TN	7.38	3.40	-3.98	-54.0%	2,291.50	2,264.03	-27.47	-1.2%	-52.75
US	253.38	295.18	41.80	16.5%	112,400.65	111,970.10	-430.56	-0.4%	16.88

Source: County Business Patterns

Film Job Growth in Top & Bottom 5 by MPI





OLS Regression

Table 4. Linear Regression Models

VARIABLES	(1) MP Emp. Growth	(2) Avg. Annual MP Growth
MPI Weighted Avg.	0.00201	0.00223
	(0.00419)	(0.00200)
Total State Emp. Growth	0.595	
	(0.881)	
Avg. Annual MP Growth		1.418
		(1.975)
Constant	-0.00470	-0.0339
	(0.0889)	(0.0401)
Observations	22	22
R-squared	0.033	0.127

*** p<0.01, ** p<0.05, * p<0.1
Robust standard errors in parentheses

Findings & Conclusions

Findings

- Use & level of MPIs rising (through 2010)
- No clear effects on employment growth
- All but 4 states did not outperform national industry job growth
- Establishment growth was somewhat better than job growth

Conclusions

- Descriptive data do not support hypotheses
- Regression models do not support hypotheses
- Establishments do better than employment
- could this lead to longer-term job growth?
- MPIs alone not likely to build self-sustaining local industry

Georgia State University | Andrew Young School of Policy Studies

Georgia Tech | Ivan Allen College of Public Policy