Do Tax Incentives Affect Business Location? Evidence from Motion Picture Production Incentives

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Abstract

I provide the first estimates of the impacts of recently-popular motion picture production incentives on filming location, establishment location, and employment using panel regression. Filming in this industry is relatively footloose, and these incentives are numerous and strong, so this is a good case study to bound the effects of tax incentives on business location. For data, I compile a detailed database of incentives across U.S. states since 2012, matching this with filming data from IMDb.com and Studio System, and establishment and employment counts from the QCEW. I compare these outcomes in states before and after they adopt incentives, relative to similar states that did not adopt incentives over the same time period (a panel difference-in-differences). I find that incentives increase filming of IMDb productions and Studio System TV series, but there is no effect on Studio System feature films or business establishments in the industry. I find evidence of employment effects but this evidence is generally marginally significant and not of a large magnitude. These results show that the ability for tax incentives to affect business location decisions is mixed, suggesting that even in this extreme "footloose" case there could be no effect of incentives.

JEL codes: H25, H71, R38, L82, Z11

Keywords: Tax credits, tax incentive, subsidies, state taxation, firm location, business location, motion picture production, film industry

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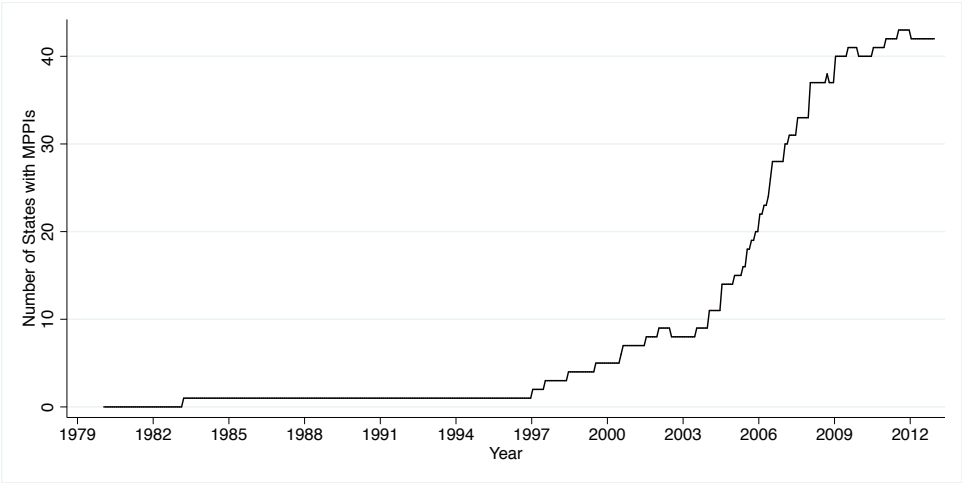
1 Introduction

Governments provide many incentives to encourage firms to choose their region for business. These incentives vary, but common strategies include tax credits, grants, financing, enterprise zones, and state taxation rates in general. One type of incentives that has rapidly spread recently are motion picture production incentives (MPPIs). MPPIs refers to a broad set of incentives for the motion picture industry provided by governments, typically state and provincial governments, but also federal governments (e.g., Canada). These subsidies are typically tax credits or cash rebates that reduce the cost of qualifying production expenses by about 18-20% on average.

Figure 1: Number of U.S. States with a Motion Picture Production Incentive (MPPI)

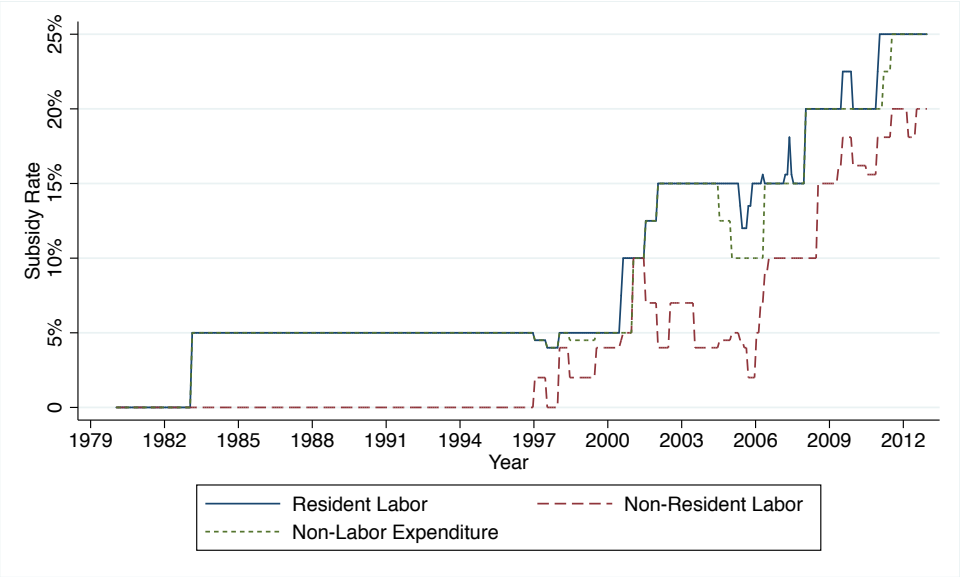


Notes: Motion Picture Production Incentives (MPPI) here include only cash rebates, grants, or tax credits for motion picture production, and do not include states with only sales tax exemptions, or other small incentives.

The first U.S. state to adopt an MPPI of this type was Arkansas in 1983, and by July 2011 there were 42 states, plus the District of Columbia, with an MPPI, as shown in Figure 1. In addition to states adopting these incentives for the first time, states with existing incentives often amended them to make them more attractive, which is reflected in increasing subsidy rates over time, shown in Figure 2. The variation in MPPIs is huge relative to the variation

in other economic development incentives[1], which makes MPPIs interesting to study.

Figure 2: Median Qualified Expenditure Subsidy Rates over Time



Notes: Medians are calculated only over the set of states with active MPPIs. States with an MPPI that does not cover a particular type of qualified expenditure (typically non-resident labor) is included as a zero in the calculation.

Reviews of the literature by Wasylenko (1999), Buss (2001), and Arauzo-Carod, Liviano-Solis and Manjón-Antolín (2010) note that the effect of incentives on firm location is still ambiguous. Some studies find at least moderate positive effects of incentives on firm location (e.g., Bartik 1985; Bartik 1989; Walker and Greenstreet 1991; Papke 1991; Strauss-Kahn and Vives 2009), while others find a small positive effect or no effect at all (e.g., Schmenner 1982; Plaut and Pluta 1983; Carlton 1983; Schmenner, Huber and Cook 1987; Blair and Premus 1987; Dabney 1991; Lee 2008).

Studying MPPIs can tell us quite a bit about the impacts that incentives have on firm location decisions. In addition to these incentives being very aggressive and there being significant variation in these incentives over time, these incentives are interesting to study because they are in a context where firms see business locations as relatively substitutable,

[1]For example, from 2000 to 2012 there were 146 changes in state MPPIs but only 49 changes in state sales tax rates, 45 changes in state corporate tax rates, and 10 changes in state investment tax credits. These calculations are available from the author upon request.

such that there should be large effects for these incentives. In the motion picture production industry, filming locations are relatively substitutable because the majority of scenes can be shot anywhere. While filmmakers often require some scenes at iconic landmarks or at city-identifying locations, filmmakers can easily use one of three strategies to fake the location. The first method is an establishing shot, such as that of an iconic landmark or downtown cityscape, before cutting to a more generic-looking location. Second is using props or set construction to disguise the location. Third is to tweak location characteristics "in post" using computer graphics[2]. Thus locational features are not important in the majority of cases.

Filmmakers are also less sensitive, relative to firms in general, to local labor and input market characteristics. When filmmakers choose to film in a region without an established motion picture production industry, they typically bring their high skilled workers (e.g., principal actors, directors, and managers) with them, and hire locally for less skilled workers (e.g., camera operators, extras, carpentry) (Tannenwald 2010; Luther 2010). Compared to firms in general, filming also requires much less physical capital investment.

What does matter more for filming location is cost, as it is becoming increasingly common for cost concerns to trump creative concerns in selecting filming locations (Christopherson and Rightor, 2010). Filming location decisions are often decided by management based on local costs and available MPPIs. Filmmakers are told to change their scripts or settings to fit new locations selected by management[3]. Independent filmmakers are expected to have MPPIs arranged already before pursuing private financing[4].

This contrasts to how firms in general choose business locations. Previous studies, summarized more exhaustively by Arauzo-Carod, Liviano-Solis and Manjón-Antolín (2010), find that several factors affect location decisions: agglomeration economies, wages, skills or education of the labor force, city population or density, land price and availability, energy costs,

[2]For excellent examples of all three, see https://youtu.be/ojm74VGsZBU (accessed 05/27/16).

[3]See http://online.wsj.com/articles/SB10001424052748703816204574489153078960792 (accessed 10/13/14).

[4]See http://independentfilmblog.com/why-film-investors-dont-want-you (accessed 10/13/14).

building costs, accessible markets for customers or suppliers, union activity or labor laws, climate, local economic conditions, and local public goods. These factors restrict the set of locations that firms can reasonably choose. Firms often consider tax incentives in their location decisions only at the last step to help decide between a few finalists (Schmenner, Huber and Cook 1987; Blair and Premus 1987; Greenstone, Hornbeck and Moretti 2010). Many of the factors in the above list are far less relevant in determining filming location[5]. For this reason, this industry provides a useful case study where incentives could matter much more, providing for an upper-bound on the effect of tax incentives on business location.

To what extent can MPPIs pull relatively "footloose" filming away from the established industry clusters of Los Angeles and New York? To quantify this, I compiled a database of all MPPIs from 1980 to 2012 at the U.S. state level. I combine this MPPI database with two sources of data on filming locations. The first is the Internet Movie Database (IMDb.com), which contains detailed information on almost three million productions, of which I match 189,598 productions to a state of filming during my sample period. The second is the Studio System database, which provides more accurate and complete data on major TV series (588 series) and major feature films (4,953). To estimate effects on establishments and employment I use data from the Quarterly Census of Employment and Wages (QCEW) from 1988 to 2012 for the motion picture production industry.

To estimate the causal effect of MPPIs on these outcomes, I use panel regression with two-way fixed effects using data on all states except California and New York. This panel regression approach provides a much more convincing estimate of the impacts of MPPIs by controlling for both time-invariant state characteristics and national trends in motion picture production, both of which would bias the estimated impact of MPPIs if they were

[5]One factor that does matter in this list are agglomeration economies. These agglomeration economies for the motion picture production industry are large and are behind the concentration of this industry in the Great Los Angeles and Greater New York City areas (Florida, Mellander and Stolarick, 2011). These two regions provide "thick" labor and input markets, which helps motion picture production firms piece together a network of unique workers and specialized input firms to make a motion picture production (e.g., Storper and Christopherson 1987; Scott 2004), although these agglomeration economies may be more relevant for pre- and post-production than just for filming. So while filming locations are not perfectly substitutable, I argue that they are far more substitutable than for firm location in general.

not controlled for. I start by estimating the average effects of MPPIs, followed by the effects over time (event study). I then investigate if the effects of MPPIs are mediated by their relative and absolute strength, competition between states, the existing size of the industry, or the time of MPPI adoption.

I find that MPPIs affect filming locations for IMDb productions and for Studio System TV series, with the average state receiving almost 51 additional IMDb productions per year after adopting an MPPI, and about six one-hour episodes of TV series content. These effects are stronger (weaker) for states with larger (smaller) existing motion picture production industries. However, I find no effect on Studio System feature films, or the total budgets of these feature films, suggesting that the effect on filming is mixed. I find weak evidence of employment effects and no evidence of effects on the number of business establishments. So even in a case where business locations are seen as relatively substitutable, and the incentives are generous, the effects are mixed, and any filming effects do not appear to translate into business establishments in the industry.

The rest of this paper is organized as follows. Section 2 discusses my data sources, Section 3 discusses my methodology, Section 4 presents and discusses the results, Section 5 extends the main model to investigate heterogeneous effects, and Section 6 concludes.

2 Data

To quantify the impacts of MPPIs on productions, employment, and establishments, I use four sources of data. First is a unique panel database I compiled of MPPIs in the U.S. states, second is Internet Movie Database (IMDb.com) data on filming location, third is the Studio System database, and fourth is Quarterly Census of Employment and Wages (QCEW) data on employment and establishments in the motion picture production industry.

2.1 Motion Picture Production Incentives Database

There are different types of MPPIs. The most common type, which is the focus of this paper, gives a set percentage of a motion picture production's "qualified expenditure" back to the production company as either tax credits or as a cash rebate. The other two types are sales and use tax exemptions or rebates and tax credits for investment in a motion picture production facility or capital program. From here forward, I use the term MPPIs to refer exclusively to the type I analyze, the tax credits and cash rebates for qualified expenditure on motion picture production. I focus on these because they are the most common and the strongest incentives.

Online Appendix F contains tables describing all major aspects of these MPPIs available from January 1, 1980 to September 1, 2013 in all 50 states plus DC. I compiled this database by locating the relevant laws, via statutes in WestLaw, and confirming changes in legislation over time using notes provided by WestLaw and by locating the actual acts passed, through HeinOnline, that amended these laws. In rare cases, supplementary sources such as government websites or consulting firm websites were used to confirm details that were not codified explicitly in law.

2.1.1 Categories of Qualified Expenditure and their Subsidy Rates

The primary way that MPPIs differ is in their subsidy rates for different categories of expenditure on inputs into filming. The subsidy rates almost always target three categories of expenditure: the payroll of state residents, the payroll of non-residents, and non-labor expenditures. Non-labor expenditure includes a broad, and often non-exhaustive, list of spending on inputs such as set construction, wardrobe, photography, sound, lighting, rental fees, transportation, catering, and lodging. Advertising and distribution are not included. Figure 2 shows how these subsidy rates have increased over time.

2.1.2 Refundability

The second way that MPPIs differ is in their rate of refundability, that is, how much of the MPPI filmmakers receive beyond their often low tax liabilities. Some MPPIs are cash grants or rebates, which provide filmmakers with direct cash, but the majority of MPPIs are tax credits, which are refundable, transferable, or neither. If a tax credit is refundable, it can be sold back to the state, though this is sometimes at a discounted rate. If a tax credit is transferable it can be sold, through intermediary brokers, to other firms with tax liabilities to the state. These brokers typically take a cut of 20 to 30% of the credit (Luther 2010; Christopherson and Rightor 2010). In either case the filmmaker can receive a benefit beyond their often low tax liabilities, a benefit not offered by tax credits that are neither refundable nor transferable.

2.1.3 Summary Statistics

Table 1 presents summary statistics for the MPPI database. 20.3% of all state-year observations from 1980 to 2012 are with active MPPIs. 70.8% of these observations are for "Refundable" MPPIs (cash rebates, grants, and refundable tax credits) while 23.4% are tax credits that are transferable only, and the rest are tax credits that are neither refundable nor transferable (6.7%). All MPPIs subsidize the wages or salaries of workers who are state residents, almost all subsidize non-labor expenditure (94.7%), but only 65.1% subsidize non-resident labor. The average subsidy rates are between 18% and 20% and these have increased over time (Figure 2).

2.2 The Internet Movie Database (IMDb.com)

The Internet Movie Database (IMDb) at IMDb.com is a popular online database with information on motion picture productions. IMDb includes information on 3,709,305 titles[6].

[6]See http://www.imdb.com/stats (accessed 4/1/16).

Table 1: Summary Statistics for MPPI Database

Variable	Mean	Std. Dev.	Min	Max	Obs
Active MPPI	0.203	0.396	0	1	1,683
					For Observations with an Active MPPI:
Refundable	0.708	0.456	0	1	359
Transferable	0.234	0.424	0	1	359
Neither	0.067	0.224	0	1	359
Only Resident Labor Subsidized	0.025	0.157	0	1	359
Both Labor Types Subsidized	0.028	0.165	0	1	359
Only Resident and Non-Labor Subsidized	0.324	0.469	0	1	359
All Three Subsidized	0.623	0.485	0	1	359
Resident Labor Rate (if subsidized)	18.41	10.71	2.5	50	359
Non-Resident Labor Rate (if subsidized)	19.04	10.20	2.5	50	233
Non-Labor Rate (if subsidized)	18.02	10.41	2.5	50	339

Notes: This sample is from 1980 to 2012 and observations are at the state and year level. For MPPI changes that took effect partway through the year, policy variables are set to be a weighted average between the old and new policy based on how many months each was in effect. This data was compiled through my own legal research. See Online Appendix 2 for more information on this data.

I use text-based data files provided by IMDb[7] to extract a sample of the IMDb motion picture productions that include all productions with a release date from 1981 to 2013 that list a filming location in a U.S. state. This sample includes 189,598 productions. I use the release year to estimate the filming year, by assuming the filming year was one year before the release year[8]. I then use this raw data to create state-by-year estimates of the number of productions filmed[9].

Table 2 presents summary statistics for the IMDb data. The mean number of productions filming in each state and year is 95.3, but this varies significantly across states and time. As expected, much of these productions are shot in typical film states, such as California and New York, so the median is 17.0. Figure 3a presents the number of productions by release year. Most of the productions are more recent, likely because of the increase in popularity of

[7]See http://www.imdb.com/interfaces (data extracted on 1/17/14).

[8]As described later for the Studio System feature films data, most filming occurs the year before the release year.

[9]Some productions film in multiple states. For these I assign them to each state equally.

Table 2: Summary Statistics for IMDb Data, QCEW Data, and State Taxation Controls

Variable	Median	Mean	Std. Dev.	Min	Max	Obs
IMDb Productions (1980-2012)	17.0	95.3	343.6	0	4,412	1,683
Employment (1988-2012)	672	3,387	14,063	10	122,773	1,199
Establishments (1988-2012)	119	284	752	3	6,313	1,212
Sales Tax (2000-2012)	5.00	4.87	1.88	0	8.25	663
Corporate Tax (1980-2012)	7.09	6.67	2.75	0	13.80	1,683

Notes: All data is at the state and year level (annual averages). QCEW data uses estimates for the motion picture production industry using NAICS 512110 (from 2001 to 2012) and SIC 7812 (from 1988 to 2000), which overlap perfectly. The production estimates from IMDb includes all productions with a release date from 1981 to 2013 that have a filming location attributable to a U.S. state. This is 189,598 productions, summed by state and year to create 1,683 observations. Sales tax data is from the Tax Foundation. Corporate tax rate data is from Wilson (2009) (1980-2006) and Moretti and Wilson (2014) (2007-2012).

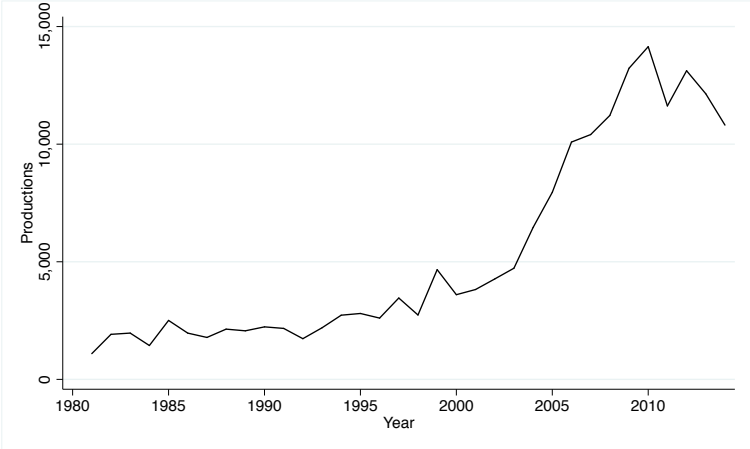
IMDb over time made the addition of more recent productions to the database more likely, but also because the number of motion picture productions (namely TV series, as shown in Figure 3b) is also increasing over time.

While IMDb provides by far the largest database of motion picture productions, the way the data is coded does not allow the productions to be separated by type (e.g., feature films, TV). There is also the concern that because IMDb is populated largely by user contributions there may be errors in the included productions or some of the included productions are not economically interesting (e.g., student films, shorts). For these reasons I explore a smaller, but more reliable, database of motion picture productions called Studio System as a complement to the larger IMDb database[10].

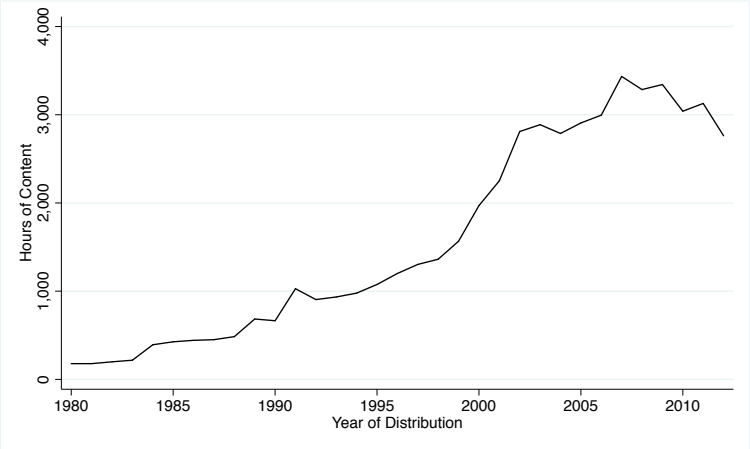
[10]I am in the process of developing code and fuzzy matching algorithms that will merge and organize the portions of the IMDb data together in a way that will help separate the IMDb data into separate databases of production by type (TV, feature films, etc).

Figure 3: Productions by Year of Distribution

(a) Number of Productions (IMDb)

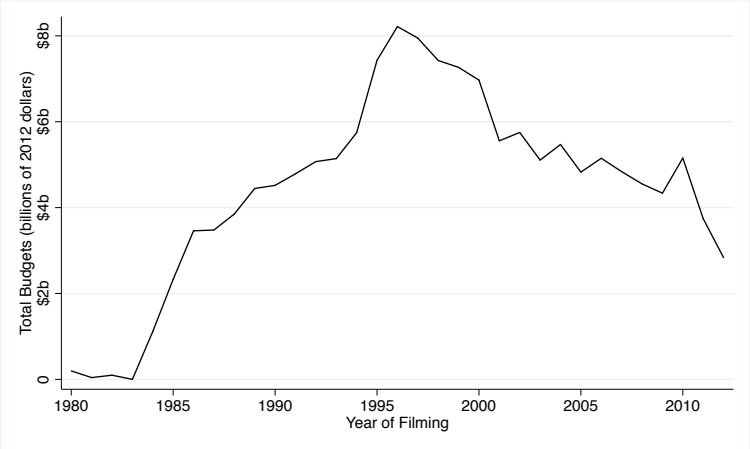


(b) Hours of TV Content (Studio System)



(c) Number of Feature Films (Studio System)

(d) Total Budgets of Feature Films (Studio System)



Notes: All samples include productions with a release year of between 1981 to 2013 that lists a state of filming. The IMDb sample includes 189,598 productions. The Studio System sample includes 588 TV series, or 2,611 production-year observations since the average series lasted for 4.44 years. The Studio System Feature Films sample is 4,953 feature films.

2.3 Studio System Filming Location Data

Studio System (formerly Baseline) is a proprietary industry database of TV series and feature films, but instead of the content being user-generated like IMDb, the content is carefully managed by their staff to ensure data quality. Compared to IMDb, Studio System lists fewer productions, likely because Studio System focuses on major productions.

2.3.1 Studio System TV Series

From Studio System I extract a database of television series where the series was distributed between 1981 and 2013, it was filmed at least partially in the United States, and it had been picked up for network or cable distribution. This extracted database contains 588 TV series. Data such as the number of seasons, average number of episodes per season, and typical episode length were missing from Studio System. This data is important because each series is not necessarily equal. The filming for a longer-running series, or a series for a 60 minute rather than a 30 minute slot would be more involved. This information was gathered manually from Wikipedia and the Internet Movie Database (IMDb) when available. The average number of episodes per season was taken as an average number of episodes for each completed season of the series[11]. The average episode length was determined based on typical television time slots. A series with a typical episode length between 20 and 30 minutes was considered a 30 minute show, and between 40 and 60 minutes was considered an hour-long show. The number of series, average number of episodes, and typical episode length were used to calculate the total hours of filmed content per series. This weights each series based on its length rather than treating all series as identical.

Table 3, Panel (a), presents summary statistics for the Studio System TV data before I collapse it to state-by-year estimates. This database contains 588 TV Series. Of the 380 of these that list a broadcast network, 114 were on NBC, 104 were on ABC, 82 were on CBS,

[11] In some cases, an outlier season was not included in the calculation if it contained significantly more or less than the average number of episodes in the other seasons of the series.

62 were on FOX, 17 were on CW, and one was on Channel 4. Each series had an average of 3.4 seasons, 18.2 episodes, and was distributed over an average of 4.4 years. 62.8% of series were for one hour TV slots, while the remaining 37.2% were for half-hour slots. Thus the average hours of scheduled content for each series was 50.4 hours over all seasons. Figure 3b present the hours of content broadcast in each year.

Table 3: Summary Statistics for Studio System TV Series Data

Variable	Median	Mean	Std. Dev.	Min	Max	Obs
Panel (a) - Raw Data:						
Years in Distribution	2	4.44	3.96	2	28	588
Seasons	1	3.41	4.05	1	28	588
Ave. Episodes per Season	13	18.20	24.52	1	207	588
Length	30 min. = 62.76%, 60 min. = 37.24%					
Panel (b) - State-Year Data:						
Hours of Content	0.00	28.52	157.96	0	1,877.5	1,632

Notes: Panel (a) presents the raw data. This sample comes from 588 TV series listed in Studio System with a release year between 1981 and 2013 that had a filming location that could be attributed to a US state. Studio System did not include data on the number of seasons, average episodes per season, or episode length, so this information was manually added. Panel (b) presents summary statistics for the hours of TV content over all productions with each state-year observation.

I then collapse this raw data to state-by-year sums of the hour of content filmed. For each series I calculate the total hours for the duration of the series, and then divide this by the years that the series was active to generate an estimate of the content filmed per year. A small proportion of TV series were filmed in multiple states[12] and for these filming is split between each state equally. Because Studio System does not include filming dates for each season, I make the assumption that the TV series started filming the year before the first season[13]. Table 3, Panel (b), presents summary statistics for the average hours of TV content associated with each state-by-year cell. The mean hours of content in each state

[12] 41 series were filmed in two states, five were filmed in three states, and nine were filmed in four states, out of 588 total. I ignore any filming locations outside the US. For cases where one of the filming locations was just for the pilot episode, then this is ignored in assigning filming location.

[13] As described later using the Studio System feature films data, most filming occurs the year before the release year.

and year is 28.5 hours, but the median is zero since TV filming is particularly concentrated.

2.3.2 Studio System Feature Films

I also extract from Studio System a database of feature films where filming was done between January 1, 1980 and December 31, 2012 , where filming had been at least partially done in the US, and where the budget was at least $300,000. I use this raw data to create state-by-year estimates of the number of feature films. I follow a similar process as for the Studio System TV data to assign films to states when the film was shot in multiple states[14].

Unlike for TV series, Studio System sometimes includes filming dates for the feature films. These are used along with release dates to estimate year of filming. Shooting dates are listed for 1,714 out of 4,953 films. For these, the film is assigned to the year it was shot. For the remaining 3,240 cases, it is assumed that the film is shot the year before its US release year[15].

Figure 3c presents the number of feature films in each year. The large increase in feature films in 1984 likely reflects that Studio System only collected data for films with a release date after 1985. There is a slight decrease in the number of films over time as firms gradually focused more on expensive blockbusters.

Figure 3d presents the total budgets of all productions filmed each year. The total budgets increase from the 1980s to 1996, where the total budgets peak at $8.2 billion in 1996. Total budgets then gradually decline over time, which is related to the decline in the number of feature films over the same period (Figure 3c).

Table 4 presents summary statistics for the Studio System feature films data. The mean feature film budget is $29.6 million in 2012 dollars ($17.6 at the median). After collapsing these 4,953 films to state-by-year estimates the mean number of films per state and year is

[14]Out of 4,953 films, 996 listed two states as filming locations, 222 listed three, 71 listed four, and 29 listed five or more.

[15]For the 1,665 films that list both a US release year and a filming start date, the US release year is the year after filming in 947 (56.9%) cases, the same year for 109 (6.6%) cases, two years for 474 (28.5%) cases, and three or more years for 135 (8.1%) cases.

2.9, or 0.5 at the median. The mean sum of the budgets of all productions in a state and year is $87.3 million in 2012 dollars ($7.3 at the median).

Table 4: Summary Statistics for Studio System Feature Films Data

Variable	Median	Mean	Std. Dev.	Min	Max	Obs
Panel (a) - Raw Data:						
Budget (millions of 2012 dollars)	17.63	29.64	36.46	0.33	417.06	4,953
Panel (b) - State-Year Data:						
Number of Productions	0.50	2.94	10.09	0	96.33	1,683
Total Budgets (millions of 2012 dollars)	7.28	87.25	329.85	0	4,054.64	1,683

Notes: Panel (a) presents the raw data. This sample comes from 4,953 feature films that were released between 1981 and 2013, that list a state of filming, and had a budget of at least $0.3 million. Panel (b) presents summary statistics when productions are summed to the state-year level.

2.4 QCEW Employment and Establishment Data

The Quarterly Census of Employment and Workers (QCEW), collected by the Bureau of Labor Statistics, provides data on employment and establishment counts that are specific to the motion picture production industry. I use employment estimates only for individuals employed at a private business establishment.

The QCEW data reports employment and establishment counts at different levels of industry specificity, based on the six digit North American Industry Classification Code (NAICS) system and the four digit Standard Industry Classification (SIC) system. The most specific data on motion picture production are at the six digit NAICS level (512110) and four digit SIC level (7812). This does not include motion picture distribution or exhibition, or sound recording. I use SIC data (7812) from 1988 to 2000, and NAICS data (512110) from 2001 to 2012, which match perfectly to make a continuous series.

Table 2 presents summary statistics for employment and establishment estimates from 1988 to 2012. At the mean (median) there are 3,387 (672) employees and 284 (119) establishments per state and year. The small number of employees relative to establishments suggests that most establishments have fewer than a dozen employees. This table also presents sum-

mary statistics for the sales tax controls (from the Tax Foundation[16]) and the corporate tax controls, from Wilson (2009) (for 1980 to 2006) and Moretti and Wilson (2014) (for 2007 to 2012).

2.4.1 Issues with QCEW Employment Data

There are, however, a few problems with the employment estimates in the QCEW that affect how the employment results are to be interpreted. First, the most severe problem is that the QCEW does not include contract jobs. 99.7% of employees appear in the QCEW employment estimates, but some individuals are hired on a contract basis. These contract jobs are somewhat common for some film crew jobs and unfortunately these jobs are not included in the QCEW. So while I cannot estimate the impact of MPPIs on these contract jobs, they are less interesting because they are often for less-skilled positions or for positions that are more likely to be temporary or part-time.

Second, because filming is mobile and project based, some workers may relocate temporarily, and some of these jobs for these non-residents are counted in the employment estimates. In this way, the employment estimates could be considered upper bounds for the employment in the state, to the extent that employment for non-residents should be disregarded.

Third, the QCEW data does not distinguish jobs based on full-time versus part-time, or full-year versus part-year. Full-year jobs are more associated with established motion picture production firms and are a better indication of an established motion picture production industry. However, it is common for workers in the industry to string together several temporary positions to achieve consistent employment, so jobs that aren't full-year aren't necessarily bad or odd. What I consider to be more of an issue is the inability to separate out the part-time jobs. Any effects on employment that I estimate are therefore a combination of full-time, part-time, full-year, and part-year jobs.

[16]See http://taxfoundation.org/article/state-sales-gasoline-cigarette-and-alcohol-tax-rates (accessed 4/15/14)

3 Methodology

I start by presenting a basic model that quantifies the effects of MPPIs on the outcome variables (filming, employment, and establishments). This basic model estimates the average effect of MPPIs post adoption. I then extend this model to an event study, where I estimate effects over time. In Section 5 I explore if the effects of MPPIs are mediated by the relative or absolute strength of the MPPI, by state competition, by the existing motion picture production industry size, or by the time of adoption.

3.1 Basic Model

I first compare states with MPPIs to those without, calculating the average increase in the outcome variable (filming, employment, establishments) in the period after MPPI adoption. For employment and establishment counts, this regression is:

$$Y_{st} = \beta MPPI_{st} + X_{st}\Phi + \delta_s\varphi + \mu_t\tau + \epsilon_{st} \tag{1}$$

Y_{st} is either the employment or the establishment count in state s at time t, where t is annual. I follow Moretti and Wilson (2014) and estimate effects in levels.[17] $MPPI_{st}$ is an indicator variable for if that state and year has an MPPI that is a cash rebate, grant, refundable tax credit or transferable tax credit. This and all subsequent regressions are estimated excluding California and New York, to capture the effects of MPPIs on states without a large existing motion picture production industry.

δ_s are state fixed effects which control for time-invariant state characteristics such as the

[17] A model that captures percent increases (e.g., log-linear) is also possible, but does not make sense for the filming data. Filming in many state-year combinations for some variables is zero (e.g., median TV content is zero), or near zero, as many states, especially less populous ones, start with little filming. This makes the interpretation difficult when the effects are measured as percent increases, since percent increases can be massive even when the level increase is small. Nevertheless, Online Appendix A estimates the main results using a percent increase model. The TV content results are robust to effects as percent increases, although the IMDb results weaken. Modeling percent increases makes more sense for the employment and establishment variables, although this doesn't change the results much (the employment results get a bit weaker).

average employment or establishments by state. For example, without state fixed effects, larger states are directly compared to smaller states, so the effects of MPPIs may get confounded with the fact that larger states are more likely to have MPPIs (as shown by Leiser 2014). μ_t are time fixed effects which control for the average change in the number of employees or establishments each year across all states. These control for national trends or shocks in motion picture production that affect all states. Since motion picture production has been increasing over time, excluding time fixed effects would confuse this trend with the adoption of MPPIs, which has also been increasing over time.

X_{st} is a set of tax controls that vary by state and year. These control for some possible effects that varied by state and year that would not be captured by the state or the year fixed effects. These tax controls include sales taxes (2000 to 2012) from the Tax Foundation[18], the effective top corporate tax rate (1980 to 2012) from Wilson (2009) (for 1980 to 2006) and Moretti and Wilson (2014) (for 2007 to 2012)[19], and controls for the few MPPIs that are neither refundable nor transferable. I choose not to include state/region/division-specific linear time trends in my main estimates, instead opting to present a more flexible event study (detailed in the next section)[20].

I cluster my standard errors at the state level (Bertrand, Duflo and Mullainathan, 2004).

[18]See http://taxfoundation.org/article/state-sales-gasoline-cigarette-and-alcohol-tax-rates (accessed 4/15/14). Since my regressions include state fixed effects, missing state sales tax data from before 2000 implies that any changes in sales tax rates from before 2000 are not controlled for, but state fixed effects control for the time-invariant differences between states in sales tax rates.

[19]This database was graciously provided by Daniel Wilson. It did not include data for 2012, which I collected via the Tax Foundation. See http://taxfoundation.org/article/state-corporate-income-tax-rates (accessed 4/15/14). The effective rate uses the top corporate tax rate, but adjusts for the deductibility of federal taxes from state taxable income, and vice-versa.

[20]The main estimates with state-specific linear time trends are presented in Online Appendix B. Since estimates often differ when group-specific linear time trends are included or excluded (Mora and Reggio, 2013), as is the case here, the question becomes which set of estimates are the most likely to be accurate. As shown later, the event study figures show no evidence of pre-trends for the filming variables, which suggests that the "Parallel Paths" assumption holds in these cases. For employment, and especially, establishments there is some evidence of a positive pre-trend. For these cases I also discuss the estimates with state-specific linear time trends. But the event study figures also show that the treatment effects (if any) are dynamic, operating in part as an increase in the growth rate (slope change), rather than an immediate jump in levels. This suggests that estimates with state-specific linear time trends could be attenuated, as discussed by Meer and West (2016). So even in the establishments cases, where they may be pre-trends, including state-specific linear time trends may not be deal. For these reasons I suggest that the estimates without state-specific linear time trends are more accurate, and for this reason I include them as the main results.

This allows for arbitrary patterns of serial correlation within states and heteroskedasticity across states, resulting in more accurate estimates of the standard errors, and more accurate inference relative to simple heteroskedasticity-robust standard errors.

3.2 Effects over Time (Event Study)

I now saturate the basic model in Equation 1 to estimate effects separately by year, following Mora and Reggio (2013) and Reber (2005). I take the $MPPI_{st}$ variable from Equation 1 and interact it with indicators for each year before or after MPPI (up to 15 years before, and 10 years after). This fully relaxes any parallel trend assumptions Mora and Reggio (2013), and allows any differential pre-trends to be seen in the data. This approach also allows for estimation of a dynamic treatment effect, as the effects of MPPIs may not have been immediate, and they may not have been long term.

This regression is:

$$Y_{st} = \sum_{t=-15}^{10} \beta_t MPPI_{st} + X_{st}\Phi + \delta_s\varphi + \mu_t\tau + \epsilon_{st} \tag{2}$$

I plot the resulting coefficients β_t over time. This provides visual evidence of if there is a pre-trend in the MPPI-adopting states before they adopt, relative to non-adopting states, and this provides for a visual picture of how the treatment effects evolve over time.

4 Results

4.1 Filming - IMDb Productions

Table 5 presents the estimates of the effect of MPPIs on filming. For IMDb productions (column (1)), a refundable or transferable MPPI is associated with a 50.75 additional IMDb productions after incentive adoption, statistically significant at the 1% level. The pre-treatment mean (at $t = -1$, the year before MPPI adoption) is 91.18 productions, so

this represents an increase of 55.66%.

Table 5: Panel Estimates of Effects of MPPIs on Filming

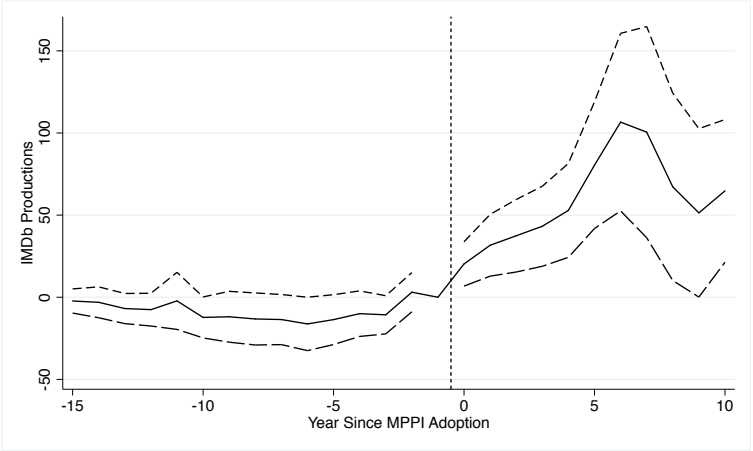
Database:	IMDb	Studio System		
Outcome:	Productions	TV Hours	Films	Total Budgets of Films ($m)
	(1)	(2)	(3)	(4)
MPPI	50.75***	6.16***	0.48	15.53
	(14.27)	(2.31)	(0.34)	(11.09)
Pre-MPPI mean:	91.18	7.53	1.58	40.06
Percent effect:	55.66	81.81	30.38	38.77

Notes: *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors, in parenthesis, are clustered at the state level. The sample does not include New York or California. The pre-MPPI mean is calculated for MPPI-adopting states the year before adoption ($t = -1$).

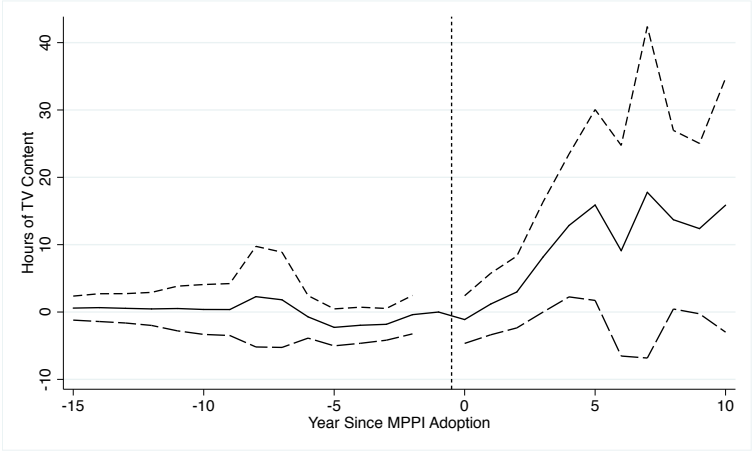
Figure 4a presents an event study of the effects on filming over time, following Equation 2. This figure presents the difference in filming in states MPPIs and without MPPIs relative to the year before MPPI adoption ($t = -1$), which is normalized to be zero. Thus any positive and statistically significant estimates mean that in these years, there was more filming in states with MPPIs, relative to those without MPPIs, relative to what this difference was at $t = -1$. The pre-MPPI trend is flat (as it is for all filming variables), suggesting that the parallel paths assumption is likely to hold, making it much easier to interpret these estimates as causal.

Figure 4: Effects of MPPIs on Filming

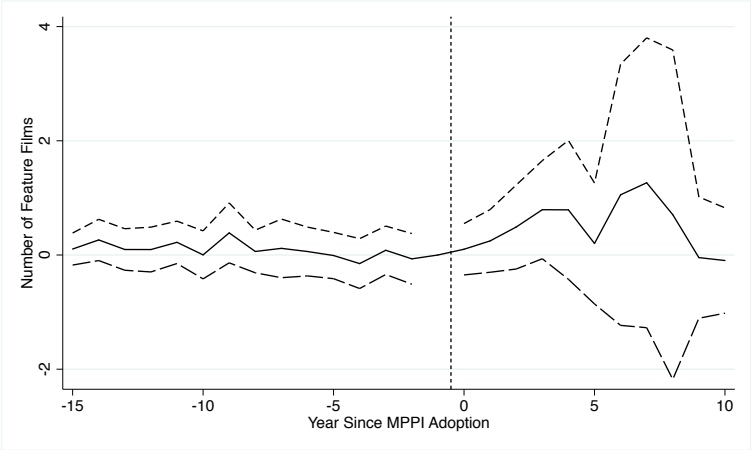
(a) IMDb Productions



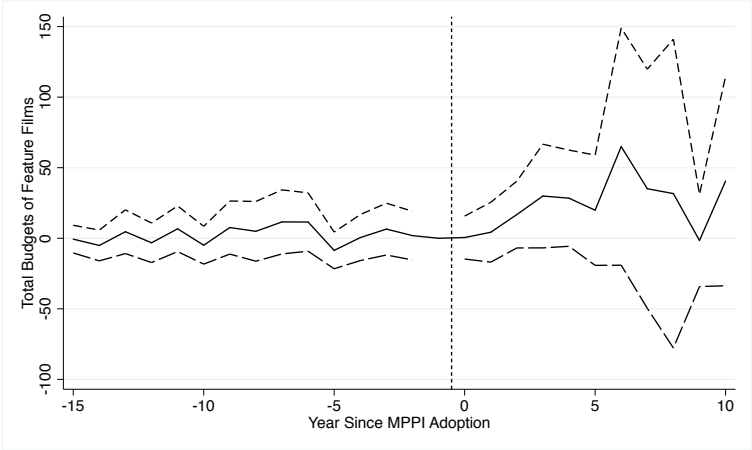
(b) Hours of TV Content (Studio System)



(c) Number of Feature Films (Studio System)



(d) Total Budgets of Feature Films (Studio System)



Notes: These series are the β estimates from Equation 2 with 95% confidence intervals (state-clustered standard errors). The effect at time $t = -1$, the year before MPPI adoption, is normalized to zero, so that all other time periods are relative to $t = -1$. Positive values indicate that filming was higher in states with MPPIs, relative to states without them, relative to this difference at time $t = -1$.

This figure shows a gradual increase in filming after MPPI adoption, with each year having an effect that is greater than zero at at least the 5% level of significance. This effect peaks at six years after adoption (106.60 productions). The interpretation of this is that six years after MPPI adoption there were 106.60 more productions filming in that year relative to the year before adoption, in states with MPPIs relative to in states without MPPIs. This effect declines after six years, dropping to 64.75 after ten years.

4.2 Filming - TV Series (Studio System)

Table 5, column (2) presents estimates of the effect of MPPIs on the hours of TV series content. The estimated effect is an increase in TV content of 6.16 hours, which is roughly half of a typical season (12.49 hours). This is a large and meaningful effect, and it represents a large percent increase (81.81%) compared to the pre-MPPI mean (7.53 hours). These effects are even larger in magnitude in some years (Figure 4b), with the effects four years after MPPI adoption up to ten years after hovering around one average season. While the effects by year are sometimes of higher magnitude, they are noisy such that only a few years have effects that are statistically significant.

4.3 Filming - Feature Films (Studio System)

Table 5, columns (3) and (4) present estimates of the effect of MPPIs on the number of feature films and the total budgets of these films. The estimated effect of MPPIs is 0.48 additional feature films, and an increase in the budgets of all feature films of $15.53 million. The magnitudes of these effects are more moderate compared to the pre-MPPI means (1.58 films, $40.06 million). However, these estimated effects are not statistically insignificant. These null effects are also reflected in Figures 4c and 4d.

Overall, MPPIs have a positive effect on IMDb productions and on Studio System TV series, but not on Studio System feature films. But why do MPPIs affect TV series far more than they affect feature films? It may be because TV series are longer and more expensive,

so they should be more sensitive to MPPIs because a larger aggregate amount is saved. Also, if a filmmaker is deciding to film in a state that is not normal for them, then there is a large fixed cost required to gather the required information on the available MPPIs and their restrictions and requirements, filming locations, local input firms, and local crew. This high fixed cost is more justifiable when the aggregate savings are larger, and the filming relationship is longer, as they are for TV series.

4.4 Employment

Table 6, column (1) present estimates of the effect of MPPIs on employment in the motion picture production industry. The estimated effect is 139.27 additional employees. Compared to the pre-MPPI mean of 1072.67, this effect is a milder 12.98% increase. This increase in employment is small relative to increases in studies that do find employment effects (e.g., Moretti and Wilson 2014). However, this employment effect is only statistically significant at the 10% level.

Table 6: Panel Estimates of Effects of MPPIs on Employment and Establishments in the Motion Picture Production Industry

	Employment (1)	Establishments (2)
MPPI	139.27*	23.12
	(72.88)	(13.96)
Pre-MPPI mean	1072.67	177.04
Percent effect	12.98	13.06

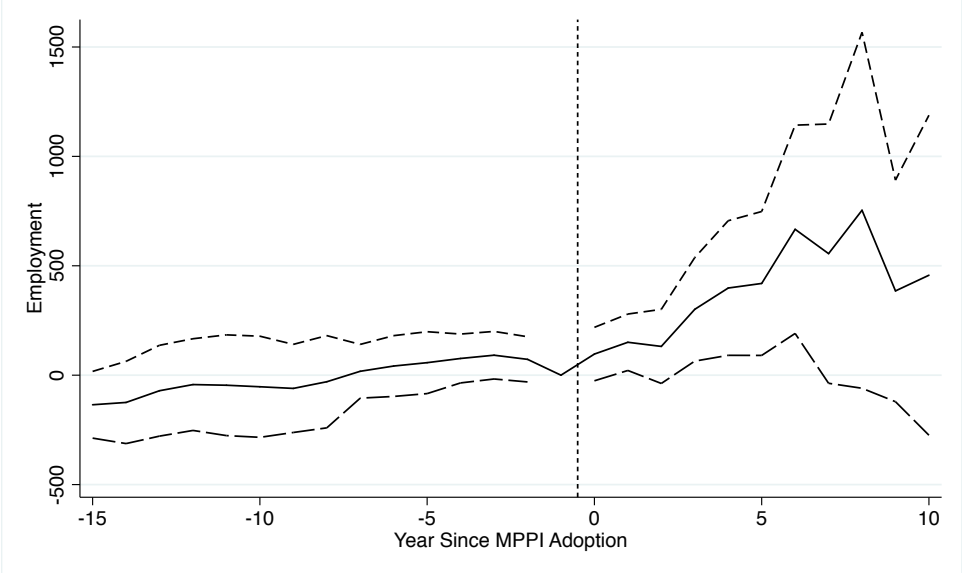
Notes: *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors, in parenthesis, are clustered at the state level. The sample does not include New York or California. Also see the notes to Table 2.

Figure 5 presents the estimated effects over time for employment. There is a slight increase in employment since MPPI adoption, peaking at eight years after adoption. There is a slight pre-trend, suggesting that there may have been some mild employment growth

for states with MPPIs anyways, independent of the effect of MPPIs. This weakens the interpretation of these results as casual. Controlling for these possible pre-trends by including state-specific linear time trends changes the estimate to -23.60, statistically insignificant (Online Appendix B Table B2). When the effect on employment is calculated as a percent increase (log-linear regression), the effect is insignificant both with and without state-specific linear time trends (Online Appendix A Table A2) and when effects are estimated over time in an event study (Online Appendix A Figure A2).

Thus there is evidence for employment effects, but this evidence is not particularly strong and the magnitude of these effects is small. In some sense these employment effects could be considered upper bounds, since some workers that temporarily migrate are included in the employment counts when perhaps they should not be if the focus is on increasing employment for locals. On the other hand, as discussed earlier, these employment estimates do not include contract jobs. While less important, these jobs could actually be more affected by MPPIs.

Figure 5: Effect of MPPIs on Employment in Motion Picture Production



Notes: See the notes to Figure 4

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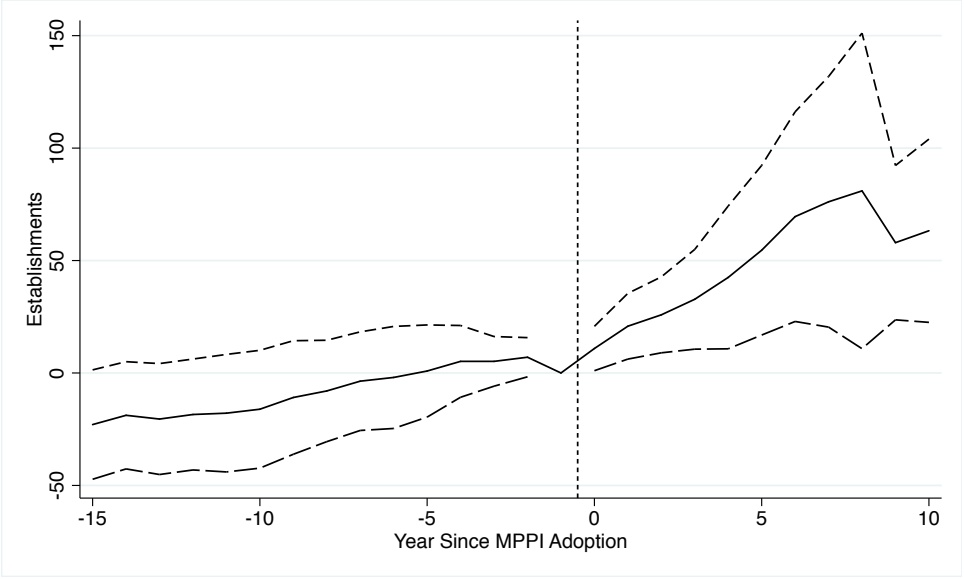
4.5 Establishments

Table 6, column (2) presents estimates of the effect of MPPIs on the number of business establishments in the motion picture production industry. The estimated effect is 23.12 additional establishments, but this is not statistically significant. Figure 6 shows some slight increase in establishments since MPPI adoption, but this effect is minimal when compared to the pre-trend, which suggests that there may have been some mild establishment growth for states with MPPIs anyways, independent of the effect of the MPPIs. If I include state-specific linear time trends (Online Appendix B Table B2) then this effect is -4.28, and still statistically insignificant. Estimates are again statistically insignificant if the effects are estimated as percent increases (log-linear regression) (Online Appendix Table A2 and Online Appendix Figure A3).

Figure 6: Effect of MPPIs on Establishments in Motion Picture Production



Notes: See the notes to Figure 4

.

5 Effect Heterogeneity

The basic model does not incorporate some factors that may mediate the effect of MPPIs. The effect of MPPIs may differ depending on the size of the existing industry, the relative and absolute strength of the MPPIs, state competition, and the timing of MPPI adoption.

5.1 Effects by Existing Motion Picture Production Industry Size

The effects of MPPIs may differ depending on the size of the existing motion picture production industry. States with larger existing industries may see larger increases in filming because it is easier for filmmakers to tap into existing networks of labor and input firms. Thus, there could be some agglomeration economies, even on a smaller scale than for Los Angeles or New York, that mediate the effects of MPPIs.

To investigate this, I estimate the same regression as Equation 1 above, but I interact $MPPI_{st}$ with the average number of establishments from 1988 to 1992 in the motion picture production industry, $Estab_s$, as a gauge of the existing size of the industry[21]. To ease interpretation, $Estab_s$ is standardized to have mean zero with a standard deviation of one. This regression is:

$$Y_{st} = \beta_1 MPPI_{st} + \beta_2 MPPI_{st} \times Estab_s + X_{st}\Phi + \delta_s\varphi + \mu_t\tau + \epsilon_{st} \tag{3}$$

Tables 7 and 8 present the results with this interaction and show a larger increase in IMDb productions for states with larger existing industries. IMDb productions increase by 76.07 for each standard deviation increase in the 1988 to 1992 establishment level. This effect is statistically significant at the 1% level. Thus it appears that the size of the industry is a mediating factor here, perhaps stemming from agglomeration economies which are common in the industry (e.g., Florida, Mellander and Stolarick 2011). The results are similar for TV,

[21]Results are similar when the average employment from 1988 to 1992 is used instead. See Online Appendix E.

with the effects being 5.56 hours larger for each standard deviation. There are no statistically significant interactions for any other variables, mirroring the main results where there were only effects for IMDb productions and for TV series.

Table 7: Panel Estimates of Effects of MPPIs on Filming - Effects by Existing Industry Size

Database:	IMDb	Studio System		
Outcome:	Productions	TV Hours	Films	Total Budgets of Films ($m)
	(1)	(2)	(3)	(4)
MPPI	34.66***	4.99**	0.58	18.59
	(10.07)	(2.05)	(0.35)	(11.14)
MPPI × Estab	76.07***	5.56***	-0.48	-14.48
	(8.60)	(1.96)	(0.33)	(11.50)

Notes: *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors, in parenthesis, are clustered at the state level. The sample does not include New York or California. The variable *Estab* is the average establishments in 1988 to 1992 in the motion picture production industry in that state. This variable is standardized to have a mean of zero and a standard deviation of one.

Table 8: Panel Estimates of Effects of MPPIs on Employment and Establishments in Motion Picture Production - Effects by Existing Industry Size (Using Establishments)

	Employment	Establishments
	(1)	(2)
MPPI	134.39*	13.47*
	(69.10)	(7.07)
MPPI × Estab	17.82	39.68
	(122.92)	(25.09)

Notes: *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors, in parenthesis, are clustered at the state level. The sample does not include New York or California. Also see the notes to Table 7.

5.2 Other Heterogeneity

In Online Appendix B, I explore if the effect of MPPIs differed based on how strong they were, both in absolute terms (e.g., a 20% subsidy versus 30%) and in relative terms (e.g., 10% when few other states had MPPIs, 10% when most states had MPPIs). There is little

to no evidence that the effects differed for stronger MPPIs or by MPPI characteristics (e.g., specific subsidy rates). So it does not appear that my main results are driven by the way that MPPIs are modeled.

In Online Appendix C, I explore if the effects of MPPIs were mediated by if neighboring states had MPPIs. This is a rough way to investigate if states compete regionally for motion picture production activity. These negative "beggar thy neighbor" effects have been found before (e.g., Wilson 2009, and somewhat in Moretti and Wilson 2014). I do not find evidence that the effect of MPPIs is mediated by neighboring states, perhaps suggesting that competition does not occur regionally so much as nationally (e.g., relocating filming from California and New York), although this is an imperfect test of regional competition.

In Online Appendix D, I explore if the effect of MPPIs was stronger if they were adopted earlier, when fewer states had MPPIs. I interact the $MPPI_{st}$ indicator variable with the year, in a similar fashion to Equation 3. I again do not find any interaction effects.

6 Conclusion

Motion picture production incentives (MPPIs) have become wildly popular at the U.S. state level since about the early 2000s. Studying them can tell us a great deal about how tax incentives affect business location decisions. First, there is a large amount of variation across time, states, and intensity of these incentives. Second, filming is particularly footloose, so this industry provides a useful case study for where incentives should really matter, providing upper bounds for the effect of incentives on business location decisions.

To estimate the impacts of MPPIs on filming location, establishments, and employment, I first combine a database I created on motion picture production incentives (MPPIs) from 1980 to 2012 with data on filming locations from the Internet Movie Database (IMDb.com) and Studio System for the same time period. I also add employment and establishment data for the motion picture production industry from the Quarterly Census of Employment and

Wages (QCEW) from 1988 to 2012.

I then use panel regression (two-way fixed effects) to compare states before and after they adopted MPPIs to similar states over the same time period who did not adopt MPPIs (a difference-in-differences). I start by measuring the average effects of MPPIs on filming, employment, and establishments, and then I estimate effects over time (event study). I then explore if the effects of MPPIs are mediated by other factors, such the strength of the incentives, state competition, time of adoption, and the existing size of the motion picture production industry.

I find that MPPIs increase filming of productions listed on IMDb.com and major TV series listed in the Studio System database. The average MPPI increases IMDb productions by about 51 and increases filmed TV content by about six scheduled hours (half of a typical TV series season). These effects are large relative to the small levels of filming in states before MPPI adoption (about 91 IMDb productions, 7.5 TV hours). These effects were larger (smaller) for states with larger (smaller) existing motion picture production industries, suggesting that perhaps agglomeration effects still matter for location decisions even when they are at a smaller scale than for the industries in Greater Los Angeles and Greater New York City. However, I find no effect on major feature films listed in the Studio System database or on the total budgets of these feature films in the state. In sum, there is mixed evidence of the effect of MPPIs on filming. So even in this footloose industry, there are not necessarily effects.

I find evidence of effects on employment in the motion picture production industry, but these estimates are sometimes marginally significant or insignificant and the employment increase is of a small magnitude (the average state adds about 140 employees, a 13% increase). For business establishments in the industry, the evidence consistently shows no effect. This suggests that while MPPIs can increase some filming, the translation of these filming projects into establishment increases is difficult. Broadly, this study suggests that tax incentives definitely can affect business location, but even in this extreme case of "footloose" filming,

incentives can, surprisingly, have no effect.

References

Arauzo-Carod, Josep-Maria, Daniel Liviano-Solis, and Miguel Manjón-Antolín. 2010. "Empirical studies in industrial location: An assessment of their methods and results." *Journal of Regional Science*, 50(3): 685–711.

Bartik, Timothy J. 1985. "Business Location Decisions in the United States: Estimates of the Effects of Unionization, Taxes, and Other Characteristics of States." *Journal of Business & Economic Statistics*, 3(1): 14–22.

Bartik, Timothy J. 1989. "Small business start-ups in the United States: Estimates of the effects of characteristics of states." *Southern Economic Journal*, 55(4): 1004–1018.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. 2004. "How Much Should We Trust Differences-In-Differences Estimates?" *The Quarterly Journal of Economics*, 119(1): 249–275.

Blair, John P., and Robert Premus. 1987. "Major factors in industrial location: A review." *Economic Development Quarterly*, 1(1): 72–85.

Burbidge, John B, Lonnie Magee, and a Leslie Robb. 1988. "Alternative Transformations to Handle Extreme Values of the Dependent Variable." *Journal of the American Statistical Association*, 83(401): 123–127.

Buss, Terry F. 2001. "The effect of state tax incentives on economic growth and firm location decisions: An overview of the literature." *Economic Development Quarterly*, 15(1): 90–105.

Carlton, Dennis W. 1983. "The location and employment choices of new firms: an econometric model with discrete and continuous endogenous variables." *The Review of Economics and Statistics*, 65(3): 440–449.

Christopherson, Susan, and N. Rightor. 2010. "The Creative Economy as "Big Business": Evaluating State Strategies to Lure Filmmakers." *Journal of Planning Education and Research*, 29(3): 336–352.

Dabney, Dan Y. 1991. "Do Enterprise Zone Incentives Affect Business Location Decisions?" *Economic Development Quarterly*, 5(4): 325–334.

Florida, Richard, Charlotta Mellander, and Kevin Stolarick. 2011. "Geographies of scope: An empirical analysis of entertainment, 1970-2000." *Journal of Economic Geography*, 12(1): 1–22.

Greenstone, Michael, Richard Hornbeck, and Enrico Moretti. 2010. "Identifying Agglomeration Spillovers: Evidence from Winners and Losers of Large Plant Openings." *Journal of Political Economy*, 118(3): 536–598.

Lee, Yoonsoo. 2008. "Geographic redistribution of US manufacturing and the role of state development policy." *Journal of Urban Economics*, 64: 436–450.

Leiser, Stephanie. 2014. "The Diffusion of State Film Incentives." *Unpublished Draft.*

Luther, William. 2010. "Movie production incentives: Blockbuster support for lackluster policy." Tax Foundation Special Report No. 173.

Meer, Jonathan, and Jeremy West. 2016. "Effects of the minimum wage on employment dynamics." *Journal of Human Resources*, 51(2): 500–522.

Mora, Ricardo, and Iliana Reggio. 2013. "Treatment Effect Identification Using Alternative Parallel Assumptions." *Universidad Carlos III de Madrid Working Papers*, 12-33(March 2013).

Moretti, Enrico, and Daniel J. Wilson. 2014. "State incentives for innovation, star scientists and jobs: Evidence from biotech." *Journal of Urban Economics*, 79: 20–38.

Papke, Leslie E. 1991. "Interstate business tax differentials and new firm location." *Journal of Public Economics*, 45(1): 47–68.

Plaut, Thomas R, and Joseph E Pluta. 1983. "Business climate, taxes and expenditures, and state industrial growth in the United States." *Southern Economic Journal*, 50(1): 99–119.

Reber, Sarah J. 2005. "Court-ordered desegregation - Successes and failures integrating American schools since Brown versus Board of Education." *Journal of Human Resources*, 40(3): 559–590.

Schmenner, Roger W. 1982. *Making Business Location Decisions.* Cliffs, NJ: Prentice-Hall Englewood.

Schmenner, Roger W., Joel C. Huber, and Randall L. Cook. 1987. "Geographic differences and the location of new manufacturing facilities." *Journal of Urban Economics*, 21(1): 83–104.

Scott, Allen J. 2004. "The other Hollywood: the organizational and geographic bases of television-program production." *Media, Culture & Society*, 26(2): 183–205.

Storper, Michael, and Susan Christopherson. 1987. "Flexible specialization and regional industrial agglomerations: the case of the US motion picture industry." *Annals of the Association of American Geographers*, 77(1): 104–117.

Strauss-Kahn, Vanessa, and Xavier Vives. 2009. "Why and where do headquarters move?" *Regional Science and Urban Economics*, 39(2): 168–186.

Tannenwald, Robert. 2010. "State Film Subsidies: Not Much Bang for too Many Bucks." Washington, DC: Center on Budget and Policy Priorities.

Walker, Robert, and David Greenstreet. 1991. "The Effect of Government Incentives and Assistance on Location and Job Growth in Manufacturing." *Regional Studies*, 25(1): 13–30.

Wasylenko, Michael J. 1999. "Taxation and Economic Development: the State of the Economic Literature." *Public Administration and Public Policy*, 72: 309–328.

Wilson, Daniel J. 2009. "Beggar Thy Neighbor? The In-State, Out-of-State, and Aggregate Effects of R&D Tax Credits." *Review of Economics and Statistics*, 91(2): 431–436.

For Online Publication - Appendix A: Effects as Percent Increases

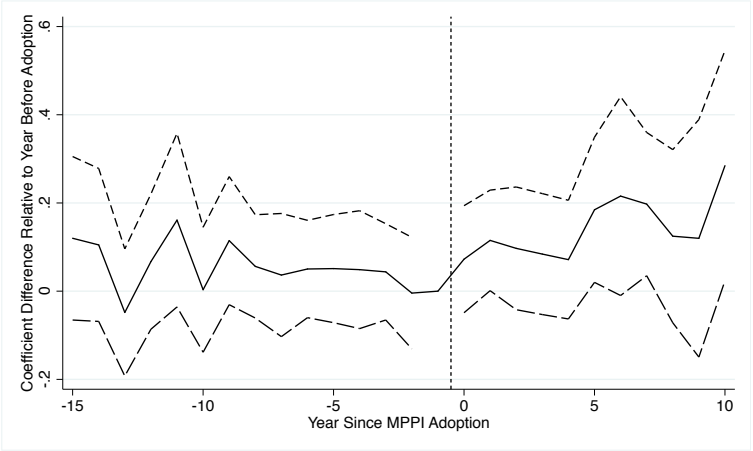
In this Online Appendix, I re-estimate the main results as percent increases instead of as level effects. The regression is the same as Equation 1 except for an $f(Y_{st})$ function instead of just Y:

$$f(Y_{st}) = \beta MPPI_{st} + X_{st}\Phi + \delta_s\varphi + \mu_t\tau + \epsilon_{st} \tag{4}$$

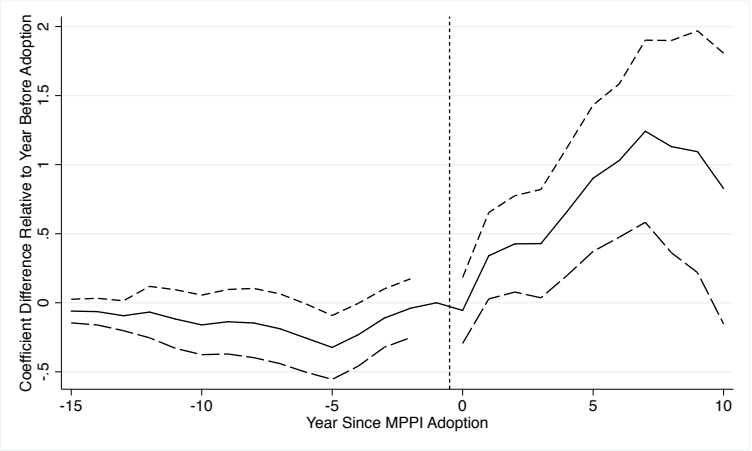
Where the function $f(Y_{st})$ is either $log(Y_{st})$, for the employment and establishment data, or $log(Y_{st} + ({Y_{st}}^2 + 1)^{\frac{1}{2}})$ (the inverse hyperbolic sine, or IHS) for the filming data. Since the filming data includes zeros, where some states and years have no filming, it is not possible to use $log(Y_{st})$ to estimate percentage effects. However the IHS has the same interpretation as $log(Y_{st})$ but allows zeros (Burbidge, Magee and Robb, 1988). These percent increase results are hard to interpret for the filming variables since most states didn't have any filming (this is especially the case for TV content), so a percent increase for a zero or near zero baseline is difficult to understand. The percent increases have a more standard interpretation for employment and establishments, and for this reason I discuss those results more in the text (the results are the same, if not weaker, as percent increases).

Figure A1: Effects of MPPIs on Filming - Estimation as Percent Increases

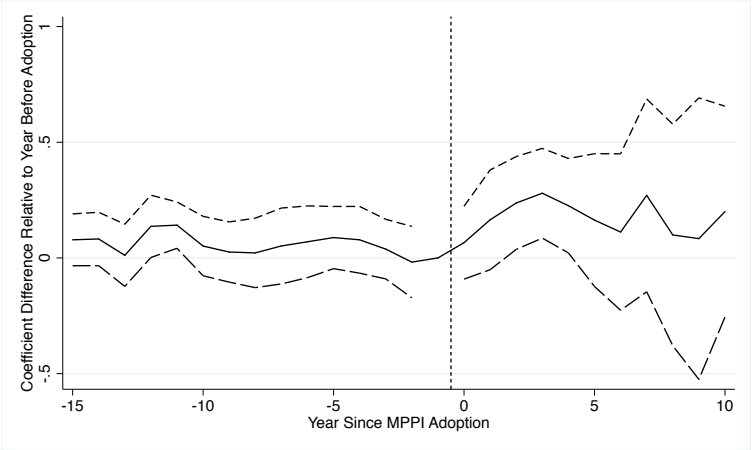
(a) IMDb Productions



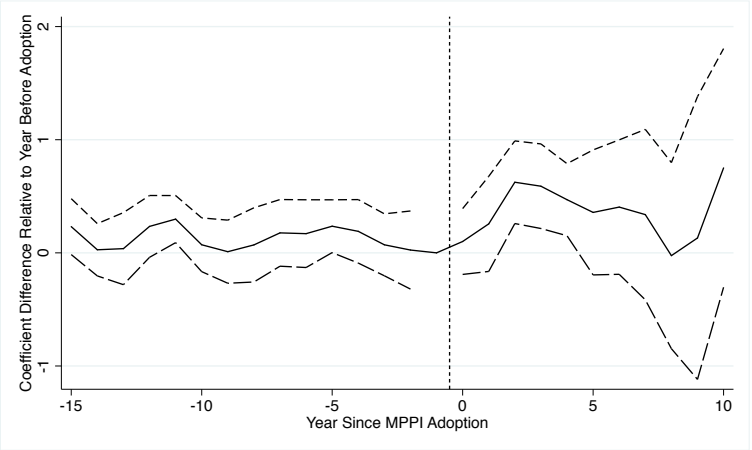
(b) Hours of TV Content (Studio System)



(c) Number of Feature Films (Studio System)

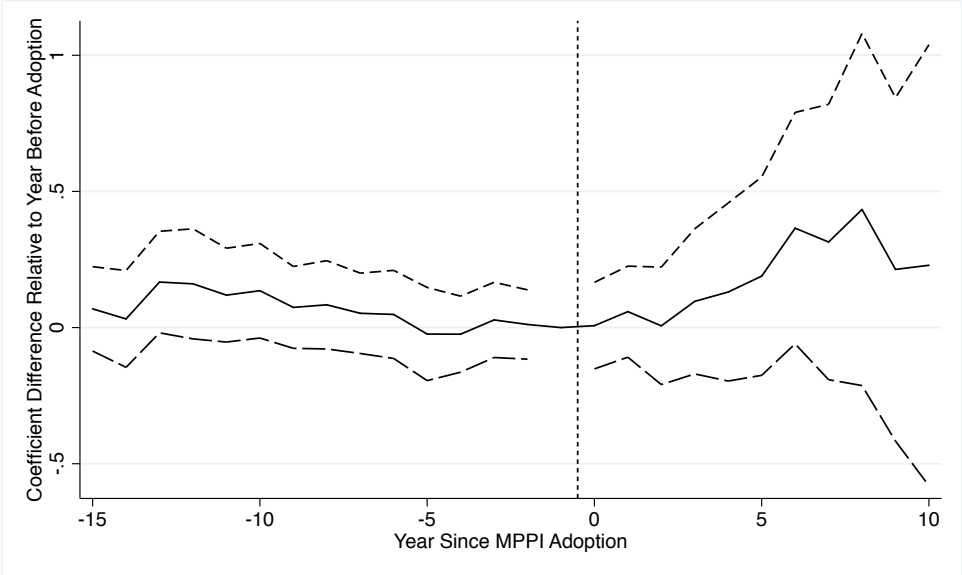


(d) Total Budgets of Feature Films (Studio System)



Notes: Estimates come from Equation 2 (although using the $IHS(Y)$ instead of just Y as the dependent variable). Time $t = -1$, the year before MPPI adoption, is normalized to zero, so that all other time periods are relative to time $t = -1$. Positive values indicate that filming was higher in states with MPPIs, relative to states without them, relative to this difference at time $t = -1$. A value of 0.5 indicates a 64.9% increase ($e^{0.5} - 1$).

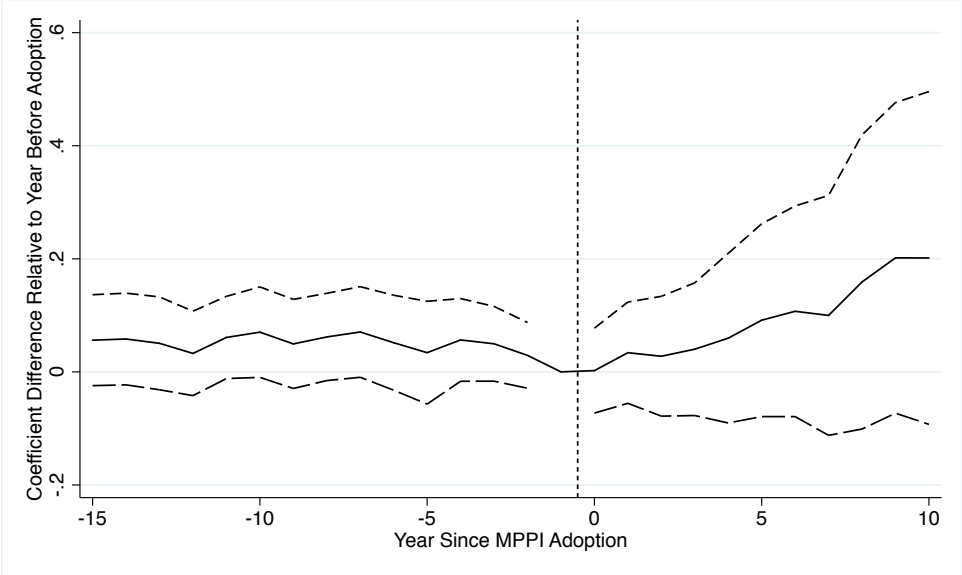
Figure A2: Effect of MPPIs on Employment in Motion Picture Production - Estimation as Percent Increases



Notes: See the notes to Figure A1

. The dependent variable is $log(Y)$.

Figure A3: Effect of MPPIs on Establishments in Motion Picture Production - Estimation as Percent Increases



Notes: See the notes to Figure A1

. The dependent variable is $log(Y)$.

Table A1: Panel Estimates of Effects of MPPIs on Filming - Estimation as Percent Increases

	IMDb		Studio System - TV		Studio System - Feature Films			
	Number of Productions		Hours of Content		Number of Films		Total Budgets	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel (a) - Average Effects:								
MPPI	0.0603	0.0201	0.6057***	0.3599***	0.1469**	0.0313	0.2849***	0.0918
	(0.0562)	(0.0498)	(0.1500)	(0.0878)	(0.0647)	(0.0764)	(0.0941)	(0.1181)
Panel (b) - Effects by MPPI Features:								
Resident × Refund	0.0040	0.0009	0.0280**	0.0321***	-0.0078	-0.0061	−0.0245**	−0.0199*
	(0.0045)	(0.0034)	(0.0131)	(0.0086)	(0.0077)	(0.0062)	(0.0121)	(0.0103)
Non-Resident × Refund	0.0060	-0.0017	-0.0205	-0.0024	0.0004	0.0007	-0.0038	-0.0056
	(0.0056)	(0.0044)	(0.0172)	(0.0118)	(0.0079)	(0.0083)	(0.0112)	(0.0121)
Non-Labor × Refund	-0.0012	0.0027	0.0100	-0.0129	0.0176*	0.0095	0.0396***	0.0243
	(0.0064)	(0.0050)	(0.0137)	(0.0119)	(0.0102)	(0.0112)	(0.0140)	(0.0171)
State-Specific Linear Time Trends	No	Yes	No	Yes	No	Yes	No	Yes

Notes: *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Each column has two separate regressions: one in Panel (a) (Equation 1) and one in Panel (b) (Equation 5) (see Online Appendix B for a discussion of Panel (b)). Standard errors, in parentheses, are clustered at the state level. The dependent variable is $IHS(Y)$.

Table A2: Panel Estimates of Effects of MPPIs on Employment and Establishments in the Motion Picture Production Industry - Estimation in Logs

	Employment		Establishments	
	(1)	(2)	(3)	(4)
Panel (a) - Average Effects:				
MPPI	0.0327	0.0504	-0.0184	0.0061
	(0.0939)	(0.0500)	(0.0557)	(0.0263)
Panel (b) - Effects by MPPI Features:				
Resident × Refund	0.0093	0.0073*	0.0010	-0.0005
	(0.0076)	(0.0038)	(0.0041)	(0.0014)
Non-Resident × Refund	-0.0016	0.0025	0.0003	-0.0028
	(0.0106)	(0.0051)	(0.0037)	(0.0022)
Non-Labor × Refund	-0.0057	-0.0018	-0.0036	0.0040**
	(0.0088)	(0.0051)	(0.0042)	(0.0017)
State-Specific Linear Time Trends	No	Yes	No	Yes

Notes: See the notes to Table A1. The dependent variable is $log(Y)$.

For Online Publication - Appendix B: MPPI Heterogeneity

In this Online Appendix, I explore how the effects of MPPIs have have differed based on how strong they were in absolute terms (e.g., 20% versus 30% subsidy rates) and how strong they were in relative terms (e.g., most attractive MPPI at a given time).

Absolute Heterogeneity in MPPIs

As shown in Table 1, MPPIs differ significantly in what categories of expenditure they cover (resident labor, non-resident labor, and non-labor expenditure), and there is some variation in if the incentive is "refundable" (cash rebate, grant, or refundable tax credit) or "transferable" (transferable tax incentive). Figure 2 shows how the subsidy rates for these categories have escalated over time.

Methodology

I extend the model in Equation 1 to incorporate the heterogeneity of MPPIs. Controlling for these different subsidy rates rates is important since they vary significantly among states. In the regressions above, I replace the $MPPI_{st}$ indicator variable with control variables for the three subsidy rates ($Resident_{st}$, $Non\text{-}Resident_{st}$, and $Non\text{-}Labor_{st}$), interacting each of these subsidy rates with $Refund$, which captures how much of the incentive filmmakers can receive beyond their tax liabilities. $Resident_{st}$, $Non\text{-}Resident_{st}$, and $Non\text{-}Labor_{st}$ are the subsidy rates, on a 0 to 100 scale, for resident labor expenditure, non-resident labor expenditure, and non-labor expenditure, respectively. $Refund = 1$ for cash rebates, grants, and fully refundable tax credits. A few tax credits are refundable at a slightly reduced rate, so $Refund$ is set equal to this rate. For transferable tax credits, a cut of 20-30% of the credit is taken by brokers when the credit is sold to a firm with tax liabilities (Christopherson and Rightor 2010; Luther 2010), so I set $Refund = 0.75$ for transferable tax credits. This

regression is:

$$Y_{st} = \beta_1 Resident_{st} \times Refund_{st} + \beta_2 Non\text{-}Resident_{st} \times Refund_{st} + \beta_3 Non\text{-}Labor_{st} \times Refund_{st} + X_{st}\Phi + \delta_s\varphi + \mu_t\tau + \epsilon_{st} \quad (5)$$

The coefficients on these subsidy rates represent the average percent increase after the respective subsidy rate is increased by one percentage point (if the refund rate is one) or increased by 4/3 of a percentage point (if the refund rate is 0.75, as is assumed for a transferable tax credit).

Results

Online Appendix Tables B1 and B2 present the results in Tables 5 and 6 with some additional results. First, it includes results with and without state-specific linear time trends. Second, it includes a second panel, Panel (b), that estimates how effects differ by MPPI characteristics (Equation 5). While MPPIs have an effect on average for IMDb productions and for TV series, there does not appear to be a direct link between these effects and a particular subsidy category. The only exception is for the employment results in the regression with state-specific linear time trends. These estimates suggest that the resident labor subsidy increases employment (significant at the 5% level), and the non-labor subsidy decreases employment (significant at the 10% level). Since the average effect here is not significant, these results suggest that perhaps MPPIs that make one category much cheaper than another can affect employment through a substitution effect. Since all MPPIs subsidize resident labor, the variation is identified from the few MPPIs that do not subsidize non-labor, or subsidize it at a lower rate. Thus for these few MPPIs there may be an employment increase. But this effect only occurs for the regression with state-specific linear time trends, so if anything this possible relationship is weak.

Table B1: Panel Estimates of Effects of MPPIs on Filming - Additional Results

	IMDb		Studio System - TV		Studio System - Feature Films			
	Number of Productions		Hours of Content		Number of Films		Total Budgets (millions)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel (a) - Average Effects:								
MPPI	50.75***	24.72***	6.16***	1.90	0.48	-0.01	15.53	-4.28
	(14.27)	(7.88)	(2.31)	(1.20)	(0.34)	(0.27)	(11.09)	(8.81)
Pre-treatment mean	91.18		7.53		1.58		40.06	
Percent effect	55.66	27.11	81.81	25.23	30.38	-0.63	38.77	-10.68
Panel (b) - Effects by MPPI Features:								
Resident × Refund	-0.12	0.18	0.02	0.17	0.03	0.01	0.41	0.08
	(1.25)	(0.56)	(0.21)	(0.16)	(0.05)	(0.03)	(1.38)	(0.74)
Non-Resident × Refund	-0.50	-0.17	-0.12	-0.01	0.02	0.02	1.09	1.13
	(1.38)	(0.76)	(0.22)	(0.16)	(0.05)	(0.04)	(1.63)	(1.38)
Non-Labor × Refund	1.46	0.46	0.18	0.06	0.02	0.02	0.63	0.37
	(1.53)	(0.94)	(0.19)	(0.21)	(0.05)	(0.04)	(1.43)	(1.30)
State-Specific Linear Time Trends	No	Yes	No	Yes	No	Yes	No	Yes

Notes: See the notes to Table 5. The sample does not include New York or California. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Each column has two separate regressions: one in Panel (a) (Equation 1) and one in Panel (b) (Equation 5).

Table B2: Panel Estimates of Effects of MPPIs on Employment and Establishments in the Motion Picture Production Industry - Additional Results

	Employment		Establishments	
	(1)	(2)	(3)	(4)
Panel (a) - Average Effects:				
MPPI	139.27*	-23.60	23.12	-1.65
	(72.88)	(57.46)	(13.96)	(7.11)
Pre-treatment mean	1072.67		177.04	
Percent effect	12.98	-2.20	13.06	-0.93
Panel (b) - Effects by MPPI Features:				
Resident × Refund	10.57	7.96**	0.49	0.25
	(8.56)	(3.16)	(0.73)	(0.28)
Non-Resident × Refund	-1.78	5.26	-1.43	-0.29
	(12.18)	(8.46)	(1.69)	(0.43)
Non-Labor × Refund	-1.48	−9.78*	1.10	0.09
	(9.15)	(5.51)	(1.35)	(0.51)
State-Specific Linear Time Trends	No	Yes	No	Yes

Notes: See the notes to Table B1 and 6. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The sample does not include New York or California.

Relative Heterogeneity in MPPIs

An aspect of the strength of MPPIs that is not accounted for in the above model is that an MPPI with a subsidy rate of, say 10% is more effective if few other states have MPPIs than if many other states do. For example, in the period around 2010, a 10% subsidy would not have been competitive relative to in the early 2000s period (Figure 2). So here I consider the *relative* ranking of MPPIs by seeing if the most aggressive MPPIs in each time period yield different effects relative to the other MPPIs.

Methodology

There is no obvious way to pick which states had the most attractive MPPIs at any given time. Each state offers different subsidy rates, so while one state may have the highest

average rate (averaging *Resident*, *Non-Resident*, and *Non-Labor* rates, each interacted with *Refund*), other states may have the highest of one of these rates. Filmmakers may also value subsidy rates differently.

Since the process of ranking states based on how attractive their MPPIs are at a given time isn't straightforward, I use a few different approaches. The first way is to rank states based on an average rate, weighting all three rates (*Resident*, *Non-Resident*, and *Non-Labor*) equally, with this average rate interacted with the *Refund* variable. The remaining three ways are to rank states using each rate separately (again interacted with *Refund*). Given these rankings, I generate indicator variables ($TopMPPI_{st}$) for if a state is the top state, in the three states, or in the top five states based on that ranking in each year. Thus there are twelve possibilities for this variable. I then run the following set of regressions:

$$Y_{st} = \beta_1 MPPI_{st} + \beta_2 MPPI_{st} \times TopMPPI_{st} + X_{st}\Phi + \delta_s\varphi + \mu_t\tau + \epsilon_{st} \tag{6}$$

where the $MPPI_{st} \times TopMPPI_{st}$ interaction captures the difference in effect between regular MPPIs and the(se) "Top" MPPI(s).

Results

Online Appendix Tables B3 to B8 present these results for each outcome variable (one per table), using both the top MPPI, top three MPPIs, and the top five MPPIs for the $TopMPPI_{st}$ variable, and by further defining "top" MPPI based on the resident labor subsidy rate (Panel (a)), the non-resident rate (b), the non-labor rate (c), or the average of all three (d). I include both estimates from regressions both with and without state-specific linear time trends.

Regardless of how $TopMPPI_{st}$ is defined (Top 1, Top 3, Top 5; the subsidy used), there is only one interaction that is statistically significant at the 5% level, out of 144. Thus, there again does not appear to be an association between MPPI strength (at least for top rates)

and outcomes, but of course it may be that I lack the power to detect impacts separately for top MPPIs relative to the other MPPIs.

Table B3: Panel Estimates of Effects of MPPIs on Filming (IMDb Productions) - Effects by Top Rates

	Top 1		Top 3		Top 5	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel (a) - Resident Subsidy Rate:						
MPPI	53.46***	27.55***	53.42***	26.70***	52.79***	26.39***
	(15.27)	(8.04)	(16.00)	(8.16)	(17.63)	(8.83)
MPPI × Top	-24.80	−21.00*	-8.73	-5.60	-4.78	-3.47
	(18.73)	(11.37)	(16.32)	(10.97)	(15.23)	(9.09)
Panel (b) - Non-Resident Subsidy Rate:						
MPPI	52.75***	28.41***	50.72***	24.64***	54.85***	26.85***
	(15.35)	(7.74)	(17.17)	(8.64)	(18.94)	(9.63)
MPPI × Top	-18.89	-30.67	0.09	0.29	-10.94	-5.25
	(31.48)	(21.17)	(18.87)	(9.94)	(18.41)	(8.60)
Panel (c) - Non-Labor Subsidy Rate:						
MPPI	52.65***	27.80***	51.46***	26.76***	49.85***	23.55**
	(15.31)	(8.10)	(15.88)	(7.96)	(17.99)	(8.95)
MPPI × Top	-15.47	−20.24*	-2.31	-5.90	2.07	2.50
	(18.72)	(11.67)	(15.37)	(9.77)	(15.45)	(8.48)
Panel (d) - Average of all Three:						
MPPI	51.83***	27.78***	50.65***	26.16***	51.68***	24.70**
	(15.47)	(7.99)	(16.26)	(8.17)	(18.16)	(9.28)
MPPI × Top	-7.48	-17.29	0.33	-4.08	-2.20	0.04
	(20.29)	(14.00)	(16.35)	(11.39)	(16.18)	(8.63)
State-Specific Linear Time Trends	No	Yes	No	Yes	No	Yes

Notes: *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The sample does not include New York or California. The regression results presented here are from Equation 6. *Top* is an indicator variable for if the MPPI is, during that year, in the top 1, 3, or 5 based on that rate. Each panel represents a different rate. Each panel and column combination is a separate regression (for 24 total). Standard errors, in parentheses, are clustered at the state level.

Table B4: Panel Estimates of Effects of MPPIs on Filming (Studio System TV Series) - Effects by Top Rates

	Top 1		Top 3		Top 5	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel (a) - Resident Subsidy Rate:						
MPPI	6.61**	2.19	6.31**	1.59	6.67*	1.26
	(2.53)	(1.37)	(3.12)	(2.07)	(3.53)	(2.43)
MPPI × Top	-3.78	-1.93	-0.50	0.88	-1.19	1.34
	(2.72)	(1.69)	(4.37)	(3.18)	(3.96)	(2.91)
Panel (b) - Non-Resident Subsidy Rate:						
MPPI	6.21**	1.91	6.13**	1.35	6.49**	1.36
	(2.47)	(1.31)	(2.88)	(1.74)	(3.18)	(2.01)
MPPI × Top	-0.45	-0.07	0.10	2.01	-0.96	1.44
	(2.07)	(1.83)	(3.82)	(2.45)	(4.15)	(2.58)
Panel (c) - Non-Labor Subsidy Rate:						
MPPI	6.51**	2.38*	6.58**	2.22	6.34*	1.27
	(2.53)	(1.31)	(2.98)	(1.79)	(3.55)	(2.17)
MPPI × Top	-2.82	−3.11**	-1.35	-0.92	-0.42	1.35
	(2.31)	(1.30)	(3.13)	(2.08)	(4.03)	(2.60)
Panel (d) - Average of all Three:						
MPPI	6.30**	2.01	6.00*	1.26	6.83*	1.22
	(2.53)	(1.46)	(3.04)	(2.01)	(3.50)	(2.39)
MPPI × Top	-1.00	-0.58	0.52	1.82	-1.59	1.42
	(3.05)	(2.67)	(4.10)	(3.13)	(4.11)	(2.87)
State-Specific Linear Time Trends	No	Yes	No	Yes	No	Yes

Notes: See the notes to Table B3.

Table B5: Panel Estimates of Effects of MPPIs on Filming (Studio System Feature Films) - Effects by Top Rates

	Top 1		Top 3		Top 5	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel (a) - Resident Subsidy Rate:						
MPPI	0.38	-0.10	0.08	-0.35	-0.00	-0.45
	(0.29)	(0.29)	(0.29)	(0.31)	(0.28)	(0.33)
MPPI × Top	0.78	0.58	1.29	0.97	1.12	0.92
	(1.11)	(0.83)	(1.14)	(0.73)	(0.83)	(0.60)
Panel (b) - Non-Resident Subsidy Rate:						
MPPI	0.56	0.05	0.21	-0.18	0.11	-0.26
	(0.35)	(0.27)	(0.31)	(0.30)	(0.35)	(0.34)
MPPI × Top	-0.74	-0.49	1.01	0.60	0.94	0.59
	(0.52)	(0.48)	(0.91)	(0.55)	(0.88)	(0.53)
Panel (c) - Non-Labor Subsidy Rate:						
MPPI	0.47	-0.03	0.22	-0.22	-0.03	-0.43
	(0.33)	(0.25)	(0.23)	(0.25)	(0.27)	(0.31)
MPPI × Top	0.03	0.12	0.84	0.61	1.21	0.92
	(0.83)	(0.76)	(0.72)	(0.52)	(0.83)	(0.59)
Panel (d) - Average of all Three:						
MPPI	0.43	-0.06	0.05	-0.35	0.04	-0.41
	(0.29)	(0.25)	(0.29)	(0.31)	(0.29)	(0.33)
MPPI × Top	0.33	0.30	1.39	0.97	1.04	0.83
	(0.63)	(0.56)	(1.15)	(0.74)	(0.85)	(0.59)
State-Specific Linear Time Trends	No	Yes	No	Yes	No	Yes

Notes: See the notes to Table B3.

Table B6: Panel Estimates of Effects of MPPIs on Filming (Studio System Total Budgets of Feature Films) - Effects by Top Rates

	Top 1		Top 3		Top 5	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel (a) - Resident Subsidy Rate:						
MPPI	16.26	-4.16	1.54	−18.59*	-1.04	−21.44*
	(10.56)	(9.31)	(9.23)	(10.43)	(8.51)	(10.71)
MPPI × Top	-6.09	-0.81	45.59	40.37*	38.77	35.52*
	(15.32)	(14.08)	(35.65)	(22.91)	(26.97)	(20.29)
Panel (b) - Non-Resident Subsidy Rate:						
MPPI	18.33	-3.21	4.80	-12.24	-2.40	−19.83*
	(11.20)	(8.61)	(9.29)	(9.09)	(11.51)	(11.32)
MPPI × Top	−26.37*	-8.95	43.33	30.02	47.03	37.94*
	(15.62)	(16.33)	(32.49)	(20.45)	(32.82)	(20.49)
Panel (c) - Non-Labor Subsidy Rate:						
MPPI	16.94	-1.88	7.71	-10.82	-1.50	−19.38*
	(11.23)	(9.06)	(7.64)	(7.97)	(8.45)	(10.04)
MPPI × Top	-11.48	-15.77	25.18	18.91	39.48	32.42*
	(16.28)	(12.07)	(19.14)	(15.72)	(26.47)	(18.51)
Panel (d) - Average of all Three:						
MPPI	14.66	-5.78	0.89	−17.86*	1.14	−18.84*
	(9.80)	(8.47)	(9.08)	(10.11)	(9.23)	(10.56)
MPPI × Top	6.11	8.86	47.86	38.58	34.54	30.49
	(18.07)	(14.79)	(36.44)	(23.76)	(27.60)	(18.49)
State-Specific Linear Time Trends	No	Yes	No	Yes	No	Yes

Notes: See the notes to Table B3.

Table B7: Panel Estimates of Effects of MPPIs on Employment - Effects by Top Rates

	Top 1		Top 3		Top 5	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel (a) - Resident Subsidy Rate:						
MPPI	147.96*	-32.93	167.94*	-39.51	123.74	-66.86
	(75.46)	(59.20)	(85.71)	(63.83)	(90.04)	(72.85)
MPPI × Top	-83.33	81.28	-95.86	46.90	33.85	84.27
	(138.70)	(97.97)	(116.33)	(105.68)	(81.13)	(52.87)
Panel (b) - Non-Resident Subsidy Rate:						
MPPI	148.27**	-29.90	160.80*	-27.72	162.64*	-41.63
	(72.68)	(56.90)	(86.84)	(61.03)	(96.38)	(63.04)
MPPI × Top	-97.85	60.09	-70.46	11.57	-54.38	37.23
	(189.28)	(85.92)	(92.48)	(58.57)	(100.15)	(55.52)
Panel (c) - Non-Labor Subsidy Rate:						
MPPI	154.99**	-23.93	148.35*	-44.91	133.52	-43.22
	(71.83)	(57.24)	(83.35)	(65.20)	(88.47)	(71.72)
MPPI × Top	-161.96	3.52	-29.85	65.60	13.39	43.81
	(118.14)	(68.67)	(96.21)	(57.02)	(104.02)	(63.79)
Panel (d) - Average of all Three:						
MPPI	145.62*	-30.07	166.23*	-12.87	127.88	-52.15
	(72.58)	(57.38)	(89.28)	(60.38)	(106.71)	(82.42)
MPPI × Top	-62.13	65.78	-82.27	-28.75	24.72	57.43
	(158.28)	(78.56)	(103.08)	(78.14)	(164.48)	(102.56)
State-Specific Linear Time Trends	No	Yes	No	Yes	No	Yes

Notes: See the notes to Table B3.

Table B8: Panel Estimates of Effects of MPPIs on Establishments - Effects by Top Rates

	Top 1		Top 3		Top 5	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel (a) - Resident Subsidy Rate:						
MPPI	24.24	-2.70	26.10	-5.34	28.28	-7.25
	(14.95)	(7.13)	(16.01)	(6.05)	(19.93)	(5.36)
MPPI × Top	-11.64	10.47	-10.04	10.88	-11.33	10.84*
	(14.00)	(6.55)	(10.94)	(7.75)	(8.93)	(6.38)
Panel (b) - Non-Resident Subsidy Rate:						
MPPI	23.68	-2.48	26.86	-3.26	29.24	-2.83
	(14.83)	(7.18)	(17.70)	(7.14)	(20.32)	(7.94)
MPPI × Top	-6.10	8.67	-12.68	4.78	-14.61	2.51
	(17.38)	(7.56)	(15.86)	(7.73)	(17.96)	(7.15)
Panel (c) - Non-Labor Subsidy Rate:						
MPPI	24.35	-2.61	24.22*	-6.75	27.78*	-6.25
	(14.84)	(7.12)	(13.47)	(5.06)	(16.14)	(5.21)
MPPI × Top	-13.14	10.71	-3.66	15.80	-11.05	10.43
	(15.46)	(7.21)	(8.36)	(10.19)	(8.73)	(7.84)
Panel (d) - Average of all Three:						
MPPI	24.06	-2.13	26.86	-3.09	26.62	-7.97
	(14.80)	(7.10)	(16.20)	(6.13)	(16.84)	(5.47)
MPPI × Top	-9.65	5.08	-11.55	3.89	-7.64	12.58
	(15.55)	(6.16)	(10.46)	(7.05)	(10.36)	(9.65)
State-Specific Linear Time Trends	No	Yes	No	Yes	No	Yes

Notes: See the notes to Table B3.

For Online Publication - Appendix C: State Competition

The effects of MPPIs may be mediated by state competition. For example, neighboring states may lure filming away from each other. To some extent this is possible as neighboring states may be more substitutable, either because of similar features or because they are geographically close so individuals can easily work in the state and reside elsewhere. On the other hand, whether a neighboring state has an MPPI may be irrelevant if most of the filming is taken from California (and, to a lesser extent, New York).

Methodology

To investigate this, I create a variable, $NearbyMPPI$ which is a weighted combination of $MPPI_{st}$ for all other states. I take the approach of Wilson (2009) and use weights for each state pairing, where the weights for a state pairing is the inverse of the distance between the population centroids in each state[22]. I then run the following regression:

$$Y_{st} = \beta_1 MPPI_{st} + \beta_2 NearbyMPPI_{st} + \beta_3 MPPI_{st} \times NearbyMPPI_{st} + X_{st}\Phi + \delta_s\varphi + \mu_t\tau + \epsilon_{st} \quad (7)$$

The coefficient on $NearbyMPPI$ captures the change in the outcome variable when nearby states have MPPIs and the coefficient on $MPPI \times NearbyMPPI$ captures the extent that MPPIs differ if neighboring states also have MPPIs.

Results

Tables C1 and C2 present the estimates from Equation 7. Interestingly, there is some evidence of increased filming (IMDb productions, TV) when neighboring states have an

[22]The data underlying the calculation of population centroids comes from 2000 Census data. I thank Daniel Wilson for providing me with this data.

incentive, although these estimates are only statistically significant at the 10% level. Thi effect may not be that surprising, especially for states that are in the same metropolitan area (e.g., Virginia, DC, and Maryland), as filmmakers may cross state lines to shoot some scenes. The effect of own MPPIs does not appear to be mediated by if neighboring states have MPPIs, although these effects are often imprecise. This results seem to suggest that regional competition is not at play much, and that perhaps if there is competition between states, it occurs on a national basis, or it occurs only with California and New York such that the neighbors distinction is not important.

Table C1: Panel Estimates of Effects of MPPIs on Filming (Studio System Data) - Effects by Neighboring MPPIs

	IMDb		Studio System - TV		Studio System - Feature Films			
	Number of Productions		Hours of Content		Number of Films		Total Budgets	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Own MPPI	26.06**	13.01	0.18	-3.57	-0.03	-0.22	-2.41	-14.18
	(12.79)	(10.60)	(2.76)	(2.86)	(0.34)	(0.30)	(13.95)	(12.11)
Nearby MPPI	55.76*	30.02*	13.57*	14.12*	1.19*	0.60	41.55	27.59
	(28.04)	(16.64)	(7.25)	(7.32)	(0.67)	(0.64)	(25.30)	(24.97)
Own × Nearby	22.91	9.50	8.53	7.95	2.39	2.18	74.48	91.92
	(69.33)	(35.57)	(17.12)	(10.30)	(1.63)	(1.77)	(60.31)	(71.56)
State-Specific Linear Time Trends	No	Yes	No	Yes	No	Yes	No	Yes

Notes: *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The sample does not include New York or California. Standard errors, in parentheses, are clustered at the state level.

Table C2: Panel Estimates of Effects of MPPIs on Employment and Establishments - Effects by Neighboring MPPIs

	Employment		Establishments	
	(1)	(2)	(3)	(4)
Own MPPI	45.29	-18.17	13.52	6.29
	(92.86)	(108.94)	(16.36)	(14.54)
Nearby MPPI	218.77	-8.25	21.99	-20.17
	(201.66)	(192.30)	(19.61)	(20.70)
Own × Nearby	632.13	147.34	53.72	-16.53
	(433.06)	(360.11)	(71.27)	(28.51)
State-Specific Linear Time Trends	No	Yes	No	Yes

Notes: See the notes to Table C1.

For Online Publication - Appendix D: Effects by Time of Adoption

MPPIs that are adopted earlier may have been more effective than MPPIs adopted later, since there were fewer other states with MPPIs to compete with. To investigate this, I ran the same regressions as Equations 1 and 5, but with the main policy variables interacted with a time variable, called $Time_t$, which is equal to the year relative to 2005.

Results

The results are presented in Online Appendix Tables D1 and D2. The estimates that interact the main effect ($MPPI_{st}$) with $Time_t$ are presented in Panel (a). In this panel, only one estimate is statistically significant at the 5% level, which is for the number of feature films (column (5)). But this estimate is in the opposite direction than would be anticipated if earlier-adopted MPPIs were more effective. This, of course, could reflect that MPPIs that were adopted later were often stronger. Panel (b) controls for these rates and does not find that MPPIs were more effective later on, controlling for these rates. In general, these results do not clearly indicate that the MPPIs have different effects if they were adopted earlier versus later.

Table D1: Panel Estimates of Effects of MPPIs on Filming (Studio System Data) - Effects by Year of Adoption

	IMDb		Studio System - TV		Studio System - Feature Films			
	Number of Productions		Hours of Content		Number of Films		Total Budgets	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel (a) - Average Effects:								
MPPI	49.52***	24.79***	5.81***	1.93	0.44	-0.01	14.75	-4.28
	(13.46)	(7.81)	(2.16)	(1.29)	(0.33)	(0.27)	(11.01)	(8.81)
... × Year Relative to 2005	1.52	1.16*	0.43	0.48*	0.04**	0.02	0.96	0.13
	(1.59)	(0.65)	(0.27)	(0.26)	(0.02)	(0.03)	(0.89)	(1.19)
Panel (b) - Effects by MPPI Features:								
Resident × Refund	1.59	0.31	-0.03	-0.08	-0.00	-0.01	-0.02	-0.17
	(1.84)	(0.69)	(0.23)	(0.18)	(0.03)	(0.02)	(0.77)	(0.60)
... × Year Relative to 2005	-0.78	-0.10	0.02	0.12	0.01	0.01	0.18	0.13
	(0.51)	(0.26)	(0.11)	(0.11)	(0.02)	(0.01)	(0.70)	(0.52)
Non-Resident × Refund	-2.49	-1.62	-0.28	-0.28	-0.02	-0.01	0.96	1.27
	(2.18)	(1.36)	(0.24)	(0.17)	(0.09)	(0.08)	(2.67)	(2.41)
... × Year Relative to 2005	0.54*	0.32	0.03	0.04	0.01	0.01	0.00	-0.05
	(0.29)	(0.21)	(0.02)	(0.02)	(0.01)	(0.01)	(0.28)	(0.26)
Non-Labor × Refund	1.70	1.32	0.25	0.21	0.06	0.06	0.86	0.27
	(2.83)	(1.28)	(0.32)	(0.26)	(0.08)	(0.07)	(2.24)	(2.05)
... × Year Relative to 2005	0.26	-0.13	-0.02	-0.08	-0.01	-0.01	-0.12	-0.03
	(0.58)	(0.30)	(0.08)	(0.07)	(0.02)	(0.01)	(0.66)	(0.53)
State-Specific Linear Time Trends	No	Yes	No	Yes	No	Yes	No	Yes

Notes: *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The sample does not include New York or California. The year variable is set to zero for 2005. Standard errors, in parentheses, are clustered at the state level.

Table D2: Panel Estimates of Effects of MPPIs on Employment and Establishments in Motion Picture Production - Effects by Year of Adoption

	Employment		Establishments	
	(1)	(2)	(3)	(4)
Panel (a) - Average Effects:				
MPPI	128.92*	-20.08	22.80	-0.011
	(69.78)	(60.11)	(14.18)	(7.83)
... × Year Relative to 2005	8.15	-4.87	0.24	-2.16
	(11.32)	(12.90)	(1.26)	(1.74)
Panel (b) - Effects by MPPI Features:				
Resident × Refund	13.76**	8.08*	0.25	-0.03
	(6.57)	(4.50)	(0.54)	(0.35)
... × Year Relative to 2005	-1.63	-0.13	0.04	0.12
	(3.96)	(2.84)	(0.30)	(0.21)
Non-Resident × Refund	-11.23	4.48	-2.83	-0.67
	(11.06)	(5.60)	(3.47)	(1.52)
... × Year Relative to 2005	2.50	0.60	0.31	0.08
	(1.82)	(1.59)	(0.43)	(0.32)
Non-Labor × Refund	0.99	-11.14	2.65	0.65
	(10.33)	(6.78)	(3.41)	(1.53)
... × Year Relative to 2005	0.50	0.68	-0.34	-0.17
	(3.12)	(2.16)	(0.61)	(0.26)
State-Specific Linear Time Trends	No	Yes	No	Yes

Notes: See the notes to Table D1.

For Online Publication - Appendix E: Effects by Existing Industry Size - Additional Results

Table E1: Panel Estimates of Effects of MPPIs on Filming - Effects by Existing Industry Size (Using Employment)

	IMDb		Studio System - TV		Studio System - Feature Films			
	Number of Productions		Hours of Content		Number of Films		Total Budgets	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MPPI	34.82***	17.83**	4.87**	2.84*	0.59*	0.16	18.63*	1.69
	(10.24)	(6.71)	(1.96)	(1.56)	(0.35)	(0.28)	(10.97)	(8.47)
... × Emp	70.76***	42.57***	5.74*	-5.80	−0.50*	−1.02***	-13.79	−36.93***
	(15.30)	(8.76)	(2.94)	(7.84)	(0.26)	(0.27)	(9.10)	(10.70)
State-Specific Linear Time Trends	No	Yes	No	Yes	No	Yes	No	Yes

Notes: See the notes to Table 7. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The sample does not include New York or California. Standard errors, in parentheses, are clustered at the state level.

Table E2: Panel Estimates of Effects of MPPIs on Filming - Effects by Existing Industry Size (Using Establishments)

	IMDb		Studio System - TV		Studio System - Feature Films			
	Number of Productions		Hours of Content		Number of Films		Total Budgets	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MPPI	34.66***	17.02**	4.99**	2.55**	0.58	0.16	18.59	2.06
	(10.07)	(6.77)	(2.05)	(1.25)	(0.35)	(0.28)	(11.14)	(8.82)
... × Estab	76.07***	44.50***	5.56***	-3.77	-0.48	−0.95***	-14.48	−36.64***
	(8.60)	(5.54)	(1.96)	(6.94)	(0.33)	(0.34)	(11.50)	(13.59)
State-Specific Linear Time Trends	No	Yes	No	Yes	No	Yes	No	Yes

Notes: See the notes to Table E1.

Table E3: Panel Estimates of Effects of MPPIs on Employment and Establishments in Motion Picture Production - Effects by Existing Industry Size (Using Employment)

	Employment		Establishments	
	(1)	(2)	(3)	(4)
MPPI	158.32**	20.36	15.15*	1.09
	(70.15)	(55.38)	(8.45)	(7.48)
... × Emp	-68.07	−214.96*	31.74	−16.03***
	(112.74)	(118.35)	(20.92)	(5.03)
State-Specific				
Linear Time Trends	No	Yes	No	Yes

Notes: See the notes to Table E1.

Table E4: Panel Estimates of Effects of MPPIs on Employment and Establishments in Motion Picture Production - Effects by Existing Industry Size (Using Establishments)

	Employment		Establishments	
	(1)	(2)	(3)	(4)
MPPI	134.39*	23.69	13.47*	0.97
	(69.10)	(58.98)	(7.07)	(7.34)
... × Estab	17.82	-213.54	39.68	−14.22**
	(122.92)	(149.33)	(25.09)	(6.25)
State-Specific				
State-Specific				
Linear Time Trends	No	Yes	No	Yes

Notes: See the notes to Table E1.

7 For Online Publication - Appendix F: Detailed History of Motion Picture Production Incentives in U.S. States

The tables in this appendix are organized as follows:

- **From, To**: Indicates the time period that this particular version of the MPPI was active. The same program often appears over several lines as either an act makes changes or as an existing part of the act takes effect. The dates listed are those for which the program is in effect with this specific criteria, and not necessarily the dates over which the law is in effect, since the statute may specify particular dates for when the program or certain program criteria are active. A dash in the "To" field indicates that this particular iteration of the program is still active as of September 1, 2013.

- **Expenditure Rates**: These are the rates applied to the three main types of expenditure: in-state non-labor expenditure (e.g., set construction, wardrobe, rentals), resident labor (payroll for residents of the state), and non-resident labor. The fourth column presents bonus rates, if they are available. Bonus rates either apply to all "qualified expenditure" or only apply to certain types (e.g., payroll of students). Unless otherwise stated, the bonus rates apply to all expenditure.

- **Refundable, Transferable, Carry Forward**: Indicates if the credit is refundable or transferable, and indicates the years the credit can be carried forward, if applicable. If the MPPI is a cash rebate instead of a tax credit, then "Rebate" is written across all three lines, as these characteristics are irrelevant (the cash rebate is roughly equivalent to a refundable tax credit). Some incentives are described as grants, so "Grant" is used similarly in the tables and is identical in practice to "Rebate".

- **Rules & Restrictions**: Lists any restrictions to qualified expenditure, minimum or

maximum expenditures required for eligibility, or other restrictions.

- **Statute**: Lists the legal citation for the statute that contained this MPPI.
- **Act**: List is the act that either created this MPPI or amended it.

In comparing one state's program over time using these tables, all information above applies unless otherwise stated. So all rows after the first row for the state only mention changes. A blank field indicates no change from above, while a non-empty cell indicates a change. In almost all cases, each state has one program at a time. When there are two programs active at one time (as manifested by two separate statutes, each with a program), then program changes are listed chronology, so the above row may refer to a different program. If this is the case then all cells will be filled in with information. The two programs can be distinguished by the different statutes that will be listed. This is the case for Louisiana, for example, which had a separate program for "digital interactive media".

List of abbreviations:

- ATL: "Above-the-line" workers. Refers to principal actors, producers, writers, and directors.
- BTL: "Below-the-line" workers. Refers to all workers that are not above-the-line.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
AL	01-Jan-09	18-Apr-12	25%	35%	25%	N/A	Yes	No	No	Expenditure of $0.5m to $10m to qualify. For soundtrack projects: $50k to $300k.	Ala. Code §41-7A-40 to -48	Act No. 2009-145
	14-Jun-11	18-Apr-12								At least $0.5m, or $50k for a music video or soundtrack. A series is now considered one production. Max. $10m in qualified expenditure could be claimed		Act No. 2011-695
	19-Apr-12	-								Max. $20m in qualified expenditure could be claimed		Act No. 2012-212
AK	02-Sep-08	30-Jun-13	30%	40%	30%	N/A	No	Yes	6 Years	$\geq$ $100k over 24 months	§43.98.030, §44.33.232 et seq.	SLA 2008, ch. 63
	01-Jul-13	-		50%	5% (ATL), 30% (BTL)		Yes*			$\geq$ $75k over 36 months	§43.98.030, §44.25.100 et seq.	SLA 2012, ch. 51
AZ	01-Jan-06	23-May-07	10%/15%/20%		0%	N/A	No	Yes	5 Years	Min. $250k. Need > $1m for 15% rate, > $3m for 20%. Several productions could be grouped to meet expenditure requirements. Residents must be paid at least $5k to qualify. Max. benefit of $5m, $7m in 2008, $8m in 2009, $9m in 2010. $\geq$ 25% of FT employees must be residents. 35% in 2007, and 50% after	§41-1517, §43-1163	2005 Ch. 317, 2006 Ch. 222
	24-May-07	31-Dec-10	20%/30%		0%					Need > $1m for 30% rate		2007 Ch. 225

*At 75% rate.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
AR	25-Feb-83	13-Apr-87	5%	5%	0%	N/A		Rebate		> $1m within 12 months	§84-4805 to -4806	Acts of 1983, Act 276
	14-Apr-87	07-Apr-91								Pre/post production allowed	§26-4-206 to -208	Acts of 1987, Act 1032
	08-Apr-91	30-Jun-93								> $1m within 12 months or $0.5m within 6		Acts of 1991, Act 989
	03-Apr-09	31-Jul-13	15%	15% (ATL), 25% (BTL)	15%					> $1m within 6 months. Only employees earning < $0.5m included.	§15-4-2003 to -2008	Acts of 2009, Act 816
	01-Aug-13	-								Amended to > $200k within 6 months.		Acts of 2013, Act 496
CA	01-Jan-11	-	20%	20%	20%	5%*	No	No†	5 Years	Feature films or TV Series: $1m-$75m, "Movies of the Week" or mini-series: >0.5m. ≥ 75% of production days in CA. Credits allocated by lottery.	CA Rev. & Tax. §17053.85, §23685	Stats.2009-2010, 3rd Ex.Sess., c.17
CO	05-Jun-06	30-Jun-09	10%	10%	0%	N/A		Rebate		≥ $100k if production originated in CO, $1m otherwise. ≥ 75% of both expenditure and payroll must be spent in CO.	§24-46-105.8	Laws 2006, Ch. 336
	01-Jul-09	17-May-10								Only up to $3m per employee eligible	§24-48.5-201 to -203.	Laws 2009, Ch. 419
	18-May-10‡	31-Dec-10			10%					Minimums amended to $100k or $250k. In-state production must include ≥ 25% residents.		Laws 2010, Ch. 232
	01-Jul-12	-	20%	20%	20%					Amended to ≥ 50%.	§24-48.5-114 to -116	Laws 2012, Ch. 186

* 25% rate for indie films or TV series that filmed all prior seasons outside CA.
† Only transferable for indie films.
‡ Effective for productions that apply on or after this date.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
CT	01-Jan-06	31-Dec-06	30%	30%	30%	N/A	No	Yes	3 Years	≥ $50k	§12-217JJ	P.A. 06-83
	01-Jan-07	31-Dec-08	30%	30%	30%					Compensation in excess of $15m per individual not qualified.		P.A. 07-236
	01-Jan-09	31-Dec-10	30%	30%	30%					Half of out-of-state expenditure eligible for credit if it is used in the state.		P.A. 07-236
	01-Jan-10	30-Jun-10	10%/15%/30% for all							Min. $100k. Need ≥ $0.5m for 15%, > $1m for 30%. Compensation limit amended to $20m. Out-of-state spending no longer eligible. ≥ 50% of principal photography days of post-production costs must be within the state.		P.A. 09-3
	01-Jul-10	-								Amended to 25% of principal photography days, 50% of post-production costs, or ≥ $1m in post-production costs.		P.A. 10-107
DE	Never											
DC	14-Mar-07	14-Oct-09	10%*	10%*	0%	N/A		Rebate		≥0.5m exp. and 5 filming days	§§39-501 & -502	D.C. Act 16-649, Act 17-381
	15-Oct-09	-	21%/42%†	0% (ATL), 30% (BTL)	42% (ATL), 0% (BTL)					≥ $250k expenditure		D.C. Act 18-207

* Lesser of 10% of qualified expenditure or a sales and use tax exemption.
† 42% for expenditures subject to DC taxation, 21% otherwise.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
FL	01-Jul-03	30-Jun-05	15%	15%	0%	5%*		Rebate		Min. $850k expenditure required. Excludes top two highest paid actors. Max. benefit of $2m for a motion picture, $450k for a production $\geq$ 90 min., $150k for a production $<$ 90 min., $25k for a music video or commercial, $15k for an industrial or educational film.	§288.1254	Ch. 2003-81
	01-Jul-05	30-Jun-07								Max. benefit amended to $2m for all cases, with $200k maximum for each of the bonus rates.		Ch. 2005-234
	01-Jul-07	30-Jun-10	10%/15%†		0%	2-7%‡				Can claim up to $400k in compensation per resident ($200k for digital media products). Min. expenditure required of $625k, $300k for digital media products, $100k for a commerical or music video, with $0.5m spent on commercials or music videos within the fiscal year. Max. payouts amended to $8m for productions in the general queue ($0.5m for a commercial or music video) and $1m in the digital media products queue. Above runtime requirements removed. At least 50% of cast and BTL crew must be residents. Other eligibility restrictions apply for the independent queue.		Ch. 2007-125

* 5% of gross revenues for the first 12 months for companies that relocate to FL and bonus 5% for qualified expenditures for "digital media effects" companies in FL. Max. $200k awarded for each of these bonus rates.
† 10% rate for productions in the digital media queue, 15% for productions in the general or "Independent Florida filmmaker" queue.
‡ +2% for "family friendly" productions, +5% for off-season production for productions in the general queue.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
FL	01-Jul-10	30-Jun-11	20%	20%	0%	5-10%*	No†	Yes	5 Years	Credits not redeemable until July 1, 2011. Cast and crew residency requirement amended to 75% for digital media, and increased for non-digital media to 60% effective July 1, 2012.		Ch. 2010-147
	01-Jul-11	-				5-35%‡				Maximum benefit of 30% of actual qualified expenses.		Ch. 2011-76
GA	01-Jan-05	31-Dec-07	9%	12%	9%	2-8%¶	No	Yes	5 Years	Min. $0.5m in expenditure required. Max. $0.5m in compensation per employee could be claimed.	§48-7-40.26	Laws 2005, Act 356
	01-Jan-08	-	30%#	30%	30%					Max. benefit of $5m. Above compensation limit only applies to W-2 employees (not 1099).		Laws 2008, Act 469
HI	01-Jan-97	30-Jun-06	Up to 4%	Up to 4%	Up to 4%	2%‖	Yes	No	No		§235-17	Laws 1997, ch. 107
	01-Jul-06	30-June-13	15%	15%	15%	5%◇				Min. $200k expenditure required		Laws 2006, ch. 88
	01-Jul-13	-	20%	20%	20%							Laws 2013, ch. 89

* Both family friendly and off-season bonuses now +5% each.
† The statute states that this tax credit is refundable at a 90% rate, but this is not funded, so in practice this tax credit is not refundable.
‡ +5% for "family friendly", +5% for off-season, +5% if at least 2/3 of filming in an under-utilized region, +5% for expenditure at a qualified production facility in FL if at least half the principal photography occurs there, +15% on compensation for students or recent graduates of a film-related program.
¶+2% if expenditure exceeds $20m for multiple TV projects, +3% if base investment in GA $\geq$ $20m, +3% for investments in less developed counties.
Technically all these rates are 20%, with +10% if a GA promotional logo is included in the finished product.
‖ Up to 6% for transcient accommodations.
◇ +5% for counties other than Honolulu.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
ID	01-Jan-08	-	20%	20%	20%	N/A		Rebate		$\geq$ \$200k expenditure required. Max. benefit of \$0.5m. At least 20% crew must be ID residents. 25% for July 1, 2010 to June 30, 2011; 30% for July 1, 2011 to June 30, 2012; 35% thereafter.	§67-4728	S.L. 2008, ch. 350
IL	01-Jan-04	31-Dec-04	0%	25%	0%	N/A	No	No	No	Only first \$25k in wages per employee qualify. Excludes the salaries of the two highest paid employees of hte production. For productions $<$ 30 min. must spend $\geq$ \$50k, otherwise \$100k.	35 ILCS 15/10	P.A. 93-0543
	01-Jan-05	30-Apr-06				10%*		Yes	5 Years			P.A. 94-0171
	01-May-06	31-Dec-08	20%	20%		15%†				Only first \$100k in wages per employee qualify. Restriction on top two highest paid employees removed.		P.A. 94-0817
	01-Jan-09	-	30%	30%								P.A. 95-1006
IN	01-Jul-07	31-Dec-11	15%	15%	0%	N/A	Yes	No	No	Compensation paid to directors, producers, screenwriters, or actors only included if they were IN residents. Min. expenditure of \$100k, or \$50k for an audio recording, music video, advertisement, or internal media. Max. benefit of \$900k.	§6-3.1-32	P.L. 235-2007

* +10% for wages of employees who are IL residents and reside in areas of high poverty or unemployment.
† +15% for wages of employees who are IL residents and reside in areas of high poverty or unemployment.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
IA	01-Jan-07	17-May-09	25%	25%	0%	N/A	No	Yes	No	Does not include compensation for directors, producters, or cast members other than extras.	§15.391 to .393	Acts 2007 (82 G.A.) ch. 162
	18-May-09	23-Nov-09*	Up to 25%	Up to 25%						The salaries of the principal producer, director, and cast member could be counted if they were IA residents and their compensation fell below a caps that was a function of expenditure.		Acts 2009 (83 G.A.) ch. 109
KS	01-Jan-07	31-Dec-08	30%	30%	30%	N/A	No	No	3 Years	Expected expenditure of at least \$100k, or \$50k if $<$ 30 mins.	§79-32,257-260	Laws 2007, Ch. 184
	01-Jan-09	31-Dec-10	0%	0%	0%					Program suspended for tax years 2009 and 2010.		Laws 2009, Ch. 142
	01-Jan-11	31-Dec-12	30%	30%	30%							
KY	01-Jul-10	-	20%	20%	20%	N/A	Yes	No	No	$\geq$ \$0.5m expenditure required for a motion picture, \$200k for a commercial, \$50k for a documentary. Max. \$100k can be claimed for each actor, director, producers, and writers.	§148.542 et seq.	2009 Ch. 1

* Program was suspended due to allegations of fraud.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
LA	01-Jun-98	30-Jun-00	0%	10%/20%*	0%	N/A	No	No	No		R.S. 47:1121 et seq.	1998 Act No. 55
	01-Jul-02	31-Dec-05								Does not include salaries $\geq$ \$1m.		2002 Act No. 1
	01-Jul-02	30-Jun-03	10%	10%	10%	5%†	No	No	10 Years	$\geq$ \$300k of base investment required. This was defined as 85% of the funds actually invested in the state.	R.S. 47:6007	2002 Act No. 6
	01-Jul-03	31-Dec-03						Yes		Minimum amended to $\geq$ \$300k of actual expenditure.		2003 Act No. 1240
	01-Jan-04	31-Dec-05				5%‡						2003 Act No. 1240
	01-Jan-06	31-Dec-06	25%	35%	25%	0%				Salaries of \$1m or more not eligible for the extra 10% bonus for LA resident compensation.		2005 Act No. 456
	01-Jan-06	30-Jun-09		10-20% for all¶		0%	No	Yes	10 Years	Certified projects in "Digital Interactive Media" only.	R.S. 47:6020	2005 Act No. 346
	01-Jan-07	30-Jun-09	25%	35%	25%	0%	Yes‖			Salaries of \$1m or more not eligible for the extra bonus for LA resident compensation.	R.S. 47:6007	
	01-Jul-09	-	30%		30%		Yes◇					2009 Act No. 478
	01-Jul-09	10-July-11	25%	35%	25%		No			Certified projects in "Digital Interactive Media" only.	R.S.47:6020	2009 Act No. 478
	11-July-11	-					Yes					2011 Act No. 415

* 20% rate if aggregate payroll > \$1m.
† +5% if base investment > \$1m.
‡ +5% if base investment > \$8m.
¶20% for first two years following certification, 15% for the third and fourth years, 10% for the fifth and sixth years.
‖ At 72% rate, 74% from January 1, 2009 to June 30, 2009.
◇ At 85% rate.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
ME	29-Mar-06	27-Sep-11	10%	12%	10%	N/A		Rebate		Only $1m in compensation per employee could be claimed. ≥ $250k expenditure over 12 months required. Rebate could not exceed tax liabilities.	5 MRSA §13090-L, 36 MRSA §5219-Y, 36 MRSA c. 919-A, §6901 & §6902.	P.L. 2005, c. 519
	28-Sep-11	-	5%									
MD	01-Jul-05	30-Jun-07	0%	50%	0%	N/A		Rebate		Only the first $25k per employee could be claimed. Employees earning ≥ $1m not included. Max. benefit of $2m per production.	Art. 83A, Subtit. 18, §5-1801 et seq.	Acts 2005, c. 96
	01-Jul-07	30-Sep-08†	Up to 25%	Up to 25%	Up to 25%					Restrictions on compensation removed.		Acts 2007, c. 87
	01-Jul-11	-	25%	25%	25%	2%*	Yes	No	No		Article - Tax - General, §10-729 et seq.	Acts 2011 c. 516, Acts 2013, c. 28
MA	01-Jan-06	31-Dec-06	25%	20%	20%	N/A	No	Yes	5 Years	≥ $250k expenditure within 12 months required for eligibility. Max. benefit of $7m. Tax credit for non-payroll expenditures allowed only if either ≥ 1/2 of expenditures or 1/2 the principal photography days occured in MA. Salaries above $1m not considered.	MA ST Ch. 62	Laws 2005 Ch. 158
	01-Jan-07	-	25%	25%	25%		Yes‡			≥ $50k expenditure required.		Laws 2007, Ch. 63

* +2% for a TV series.
† Repealed by Acts 2008, c. 306
‡ At 90% rate.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
MI	01-Jan-07	31-Dec-09*	12%/16%/20%†		0%	-	Yes	No	No	Only $100k per employee considered. ≥ $200k in expenditure required.	MCL 205.54cc	P.A. 2006, No. 657
	21-Dec-10	30-Sep-11	40%	30%	30%	2%‡		Yes		Only $2m per employee considered. ≥ $50k in expenditure required.	MCL 208.1455	P.A. 2010, No. 312
	01-Oct-11	31-Dec-12	27%	32%	25%	3%¶		Rebate		The producer fees that could be claimed were capped at 5% of the payroll of Michigan personnel, or 10% if the producer was a MI resident.		P.A. 2011, No. 291
	01-Jan-13	-			20%					Other rates set to change in 2014 and 2015.		
MN	01-Jul-97	31-Dec-00	5%	5%	5%	N/A		Rebate		Max. benefit of $100k	116J.543	Laws 1997, c. 200
	01-Jan-01	30-Jun-02	10%	10%	10%							Laws 2001, 1st Sp., c. 4
	01-May-06	30-Jun-07	Up to 15%	Up to 15%	Up to 15%						116U.26	2006 Ch. 282
	30-May-08	30-Jun-10	Up to 20%	Up to 20%	Up to 20%					≥ $5m expenditure within 12 months required.		2008 Ch. ?
	01-Jul-10	22-May-13	Up to 15%	Up to 15%	Up to 15%	5%‖				Minimum removed.		2010 Ch. 215
	23-May-13	-	Up to 20%	Up to 20%	Up to 20%	5%◇				Only $100k in compensation per individual could be claimed.		HF729

* Repealed by P.A. 2009, No. 78
† 16% if expenditure ≥ $1m, 20% if ≥ $10m, but only the first $10m recieves this 20% rate.
‡ +2% if production occurs in a "core community".
¶+3% if production occurs in a "core community".
‖ +5% if either production is lcoated outside the metropolitan area or expenditure exceeds $5m.
◇ Same as above except $1m instead of $5m.

	From	To	Expenditure Rates: In-State Non-Labor	Expenditure Rates: Resident Labor	Expenditure Rates: Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
MS	01-Jul-04	12-Mar-07	10%	10%	0%	N/A	No*	No	10 Years*		§57-89-3 et seq.	2004 Ch. 528
	13-Mar-07	08-May-08	20%/25%/30%†		10%			Rebate		Non-resident compensation only included for workers who made < $1m. Max. benefit of $5m.		2007 Ch. 324
	09-May-08	16-Mar-11	20%	25%	20%					Up to $1m in compensation per employee can be claimed. ≥ $20k in expenditure required. Max. benefit of $8m.		2008 Ch. 524
	17-Mar-11	11-Apr-13	25%	30%	25%					≥ $50k in expenditure required.		2011 Ch. 453
	12-Apr-13	-				5%‡				Max. benefit of $10m		2013 Ch. 490
MO	01-Jul-99	27-Aug-04	Up to 50%	Up to 50%	Up to 50%	-	No	Yes	5 Years	Min. ≥ $300k in expected expenditure. Max. benefit of $0.5m and one project per company per year.	135.75	L.1998 S.B. No. 827
	28-Aug-04	31-Dec-08								Max. benefit increased to $1m.		L.2004, S.B. No. 1394
	01-Jan-08	-	35%	35%	30%					Cannot claim any compensation for employees earning > $1m. Min. ≥ $50k expenditure, or $100k if > 30 minutes.		L.2007, 1st Ex. Sess., H.B. No. 1
MT	06-May-05	02-May-07	8%	12%	0%	N/A	Yes	No	4 Years¶	Only the first $50k per resident qualifies. Max. benefit of $1m	§15-31-907 et seq.	Laws 2005, ch. 593
	03-May-07	-	9%	14%						Max. benefit removed.		Laws 2007, ch. 367

* This incentive is a tax credit for in-state non-labor expenditure, which has a carry forward, and a rebate for resident labor.
† The first $1m of "base investment" (which does not include non-resident labor) receives the 20% rate. The next $4m recieves 25%, and any beyond $5m recieves the 30% rate.
‡ +5% for the payroll of honorably discharged veterans of the United States Armed Forces.
¶Carry forward only for resident payroll.

	From	To	Expenditure Rates: In-State Non-Labor	Expenditure Rates: Resident Labor	Expenditure Rates: Non-Resident Labor	Expenditure Rates: Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
NE	Never*											
NV	01-Jan-14	-	15%	15%	12%	2-4%†	No	Yes	No	Compensation to producers must not exceed 5% of expenditure, or 10% if the producer is a NV resident to be claimable. Min. $0.5m in expenditure required. Max. benefit of $6m per production. $\geq$ 60% of expenditures must occur in NV.	§360.2?	Laws 2013, Ch. ?
NH	Never											
NJ	01-Jul-05	10-Jan-08	20%	20%	0%	N/A	No	Yes	7 Years	Max. benefit of 50% of tax liability. $\geq$ 60% of expenditure must take place in NJ. Must be $\geq$ 15 minutes and aimed at a national audience	C.54:10A-5.39, CA54A:4-12	Laws 2005, Ch. 345
	11-Jan-08	28-Jun-10								Min. $2m expenditure required. A "significant" percentage of expenditure must be for compensation of full-time NJ residents.		Laws 2006, Ch. 257
	28-Jun-10	-								Tax credits temporarily non-redeemable for FY 2011.	Added C.54:10A-5.39a, CA54A:4-12a	Laws 2010, Ch. 20

* On April 5, 2012, the governor approved LB 863, which amended the Local Option Municipal Economic Development Act to allow certain cities and villages to collect property taxes or local sales taxes, if approved by voters, to fund economic development projects, which could now include an MPPI. The three largest cities do not fall under this act.
† +2% if more than half the BTL personnel are NV residents. +2% if more than half the filming days occur in a county that has less than $10m in direct production expenditures in the last two years.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
NM	01-Jan-02	30-Jun-03	15%	15%	0%	N/A	Yes	No	No		§7-2F-1 et seq.	L. 2002, Ch. 36
	01-Jul-03	31-Dec-05			15%*							L. 2003, Ch. 36; L. 2005, Ch. 104
	01-Jan-05	30-Jun-06	15/20%†	15/20%†							Added §7-2G-1‡	L. 2005, Ch. 337; L. 2006, Ch. 78
	01-Jan-06	30-Jun-07	25%¶	25%¶	0%							L. 2006, Ch. 78
	01-Jul-07	30-Jun-11								Max. claim of $5m in expenditure for performing artists.		L. 2007, Ch. 172
	01-Jul-11	-	25/30%‖	25/30%◇						Cannot claim this incentive along with the sales tax exemption.		L. 2013, Ch. 160

* Only performing artists.
† 20% rate only for a TV series with ≥ 60% of BTL crew payroll paid to NM residents.
‡ This bonus program was added as a separate statute, and then repealed effective July 1, 2006.
¶Any expenditure that received the federal New Markets Tax Credit gets a 20% rate.
‖ 30% rate for a TV series with ≥ six episodes and a budget ≥ $50k per episode.
◇ 30% rate can be achieved for a TV series with ≥ six episodes and a budget ≥ $50k per episode or for labor costs of non-performing artists for productions that shoot ≥ 10 days at a NM production facility, or ≥ 15 days if the budget > $30m.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
NY	01-Jan-04	22-Apr-08	10%	10%	10%	N/A	Yes	No	No	$\geq$ 75% of expenditure must be associated with a qualified production facility in NY.	N.Y Tax Code Ch. 60, Art. 1, sec. 24	L. 2004, c. 60
	23-Apr-08	10-Aug-10	30%	30%	30%							L. 2008, c. 57
	11-Aug-10	-				5%*				Post-production added in separate statute. $\geq$ 10% of principal photography days must be at a qualified facility (except if a qualified independent film company).	Added N.Y Tax Code Ch. 60, Art. 1, sec. 31	L. 2010, c. 57
NC	02-Aug-00	30-Oct-02	15%	15%	15%	N/A		Grant		Max. benefit of $200k per production.	§143B-434.3	S.L. 2000-153
	31-Oct-02	30-Jun-03								$\geq$ $1m expenditure required.		S.L. 2002-172
	01-Jul-03	30-Jun-05									Relocated to §143B-434.4	
	01-Jul-05	31-Dec-09					Yes	No	No	$\geq$ $250k expenditure required. Max. benefit of $7.5m if a feature film. Does not include individuals earning > $1m.	§105-130.47, §105-151.29	S.L 2005-276
	01-Jan-10	22-Jul-10	25%†	25%†	25%†	N/A	Yes	No	No	$\geq$ $250k expenditure required. Benefit reduced by what would have been paid in sales or use tax.		S.L 2009-529
	22-Jul-10	-	25%	25%	25%					Max. benefit increased to $20m.		S.L 2010-147

* +5% for post-production expenditure in upstate NY.
† This 25% rate was an alternative credit briefly added to the statute. The criteria listed applies to this credit and not the original 15% credit is as listed above. This was removed effective

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
ND	Never											
OH	01-Jul-09	-	25%	25/35%*	25%	N/A	Yes	No	No	$\geq$ \$300k expenditure required. Max. benefit of \$5m.	§122.85, §131.02	2009 H 1
OK	01-Jul-01	30-Jun-02	15%	15%	0%	N/A	Rebate			Cannot take this incentive and the sales and use tax exemption at the same time.	§3621 tit. 68	Laws 2001, Ch. 259
	01-Jul-02	05-Jun-05								Min. budget of \$1m.		Laws 2002, Ch. 203
	06-Jun-05	30-Jun-06	5/10/15%†							Min. budget of \$2m, of which $\geq$ \$1.25m spent in OK.		Laws 2005. c. 259
	01-Jul-06	30-Jun-07	5/10/15%‡							No more than 25% of expenditure can be for ATL salaries.		Laws 2006. c. 29
	01-Jul-07	30-Jun-09	5/10/15%¶							Min. budget of \$0.5m, of which not less than \$300k spent in OK.		Laws 2007. c. 341
	01-Jul-09	-	35%	35%		2%‖				$\geq$ \$50k expenditure required, of which $\geq$ \$25k is spent in OK.		Laws 2009, c. 426

* 35% for cast and crew that are OH residents.
† 5% if $<$ 25% of crew are OK residents, 10% for 25% to 49%, 15% for $\geq$ 50%.
‡ As above, but 15% rate also achievable by having a budget of $\geq$ \$30m.
¶As above, but \$5m.
‖ +2% if the company spends $\geq$ \$20k for music created by an OK resident or recorded in OK.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
OR	04-Nov-05	-	0%	6.2%	6.2%	N/A		Rebate		$\geq$ \$1m expenditure required.	§316.131 et seq.	Laws 2005, Ch. 559
	01-Jul-05	26-Sep-07	Up to 10%	Up to 10%	Up to 10%	N/A	No	Yes	3 Years	$\geq$ \$250k expenditure for a film, \$30k for a TV episode. Benefit capped at the larger of \$1m or tax liability.	§284.300 et seq.	Laws 2003, Ch. 736
	27-Sep-07	26-Sep-09	Up to 20%									Laws 2007, Ch. 815; Laws 2007, Ch. 843
	27-Sep-09	-								Local filmmakers eligible if expenditure $\geq$ \$75k and $\leq$ \$750k.		Laws 2009, Ch. 787
PA	01-Jul-04	06-Jul-05	20%	20%	20%	N/A	No	Yes	3 Years	$\geq$ 60% of expenditure must be in PA.	§8701-C et seq.	Act 2004-95
	07-Jul-05	30-Jun-06	Up to 20%	Up to 20%	Up to 20%					Does not include compensation for those earning > \$1m.		Act 2005-40
	01-Jul-06	-	Up to 20%	Up to 20%	Up to 20%			Grant		Does not include compensation for those earning > \$1m. 60% of expenditure must be in PA.	§4101 et seq.	Act 2006-42
	25-Jul-07	01-Jul-12	Up to 25%	Up to 25%	Up to 25%	N/A	No	Yes	3 Years	Can only claim \$15m in compensation. $\geq$ 60% of expenditure must be in PA.	§8701-D et seq.	Act 2007-55
	02-Jul-12	-								60% requirement could be waived if $\geq$ \$1.5m (or \$5m if expenditure > \$30m) was spent at a qualified production facility.		Act 2012-85; Act 2013-52

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
RI	13-Jul-00	27-Jun-02	25%	25%	25%	N/A	No	No	7 Years	Budget of $300k to $5m. The median annual wage paid to full time employees must be above the average annual wage paid by all taxpayers in the state which share the same two-digit SIC Code. Does not reduce the tax due for the year by more than 50% of the tax liability that would be payable, or less than the minimum tax as prescribed in §44-11-2(e) for corporations.	§44-31-1 et seq.	P.L. 2000, Ch. 224
	28-Jun-02	31-Dec-04								Removed wage restriction. Primary filming locations must be in RI.	§44-31.1-1 et seq.	P.L. 2002, Ch. 265
	01-Jan-05	13-Apr-06	15/25%*	15/25%	15/25%				3 Years	Base investment of $\geq$ $300k. $5m cap removed.	§44-31.2-1 et seq.	P.L. 2005, ch. 95
	14-Apr-06†	30-Jun-12	25%	25%	25%			Yes				P.L. 2005, ch. 19
	01-Jul-12	-								Budget of $\geq$ $100k. Max. benefit of $5m, but could be waived for some feature films and TV series. Either at least 51% of filming must occur in RI or 51% of the budget must be spent in RI and the production must employ at least five individuals in the state.		P.L. 2012, ch. 241

* 25% if total base investment > $5m.
† Changes in this act were retroactive to January 1, 2005.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
SC	01-Jul-04	30-Jun-08	0%	5%	5%	N/A		Rebate		$\geq$ \$1m expenditure required. Cannot claim compensation of $\geq$ \$1m.	§12-62-10 et seq.	2004 Act No. 299
	01-Jul-08	07-May-13		15%	15%							2008 Act No. 313, 2008 Act No. 359
	08-May-13	-	Up to 30%	25%	20%							2012 Act No. 26
SD	Never											
TN	27-Jun-06	30-Jun-12	17%	17%	17%	N/A		Grant		$\geq$ \$0.5m per production/episode required (\$150k if through a TN-based production company.)	§4-3-4902 et seq.	2006 Ch. 916
	27-Jun-06	30-Jun-12	15%	15%	15%	N/A		Grant		$\geq$ \$1m expenditure required.	§67-4-2109	2006 Ch. 1019
	01-Jul-12	-	$\approx$ 25%*	$\approx$ 25%*	$\approx$ 25%*	N/A				$\geq$ \$200k per production/episode required	§4-3-4902 et seq.	
TX	01-Sep-05	07-Jun-07	0%	20%	0%	5%†		Grant		$\geq$ \$0.5m in wages to TX residents required, or \$50k for commercials. Max. benefit of \$750k. Does not include wages or compensation that are "a major part of the production costs of the entertainment, as determined by the office" or negotiated or spent before production begins.	§485.001 et seq.	2005 Ch. 342

* "The amount of each grant awarded pursuant to this section shall not exceed twenty-five percent (25%) of the total expenses incurred by a production company for a project; except, however, the department may award grants in excess of this amount if deemed appropriate by the department. It is the legislative intent that funding be appropriated each year in the general appropriations act for awarding grants. It is further the legislative intent that the department strive to award the maximum amount of incentive grants authorized by this section" (§4-3-4903(2))

† +5% if at least 25% of the filming days occur outside the metro areas of Austin, Houston, or Dallas-Fort Worth.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
TX	08-Jun-07	09-Mar-08	5%	5%	5%	1.25%*				$\geq$ \$1m expenditure required, or \$100k for commercials. Max. benefit of \$2m for a film, \$2.5m for a TV program, \$200k for commercials, \$250k for a digital interactivce media production. $\geq$ 80% of production days in TX, $\geq$ 70% of both paid crew and cast must be TX residents.		2007 Ch. 260
	10-Mar-08	31-Oct-09								Only the first \$50k of compensation (\$200k for department heads) was claimable.	Added 13 TAC §§121.1-121.14	33 TexReg 2019
	01-Nov-09	27-Aug-11	0%	8/17/25%	0%	4.25%†				Texas Wage Option. Must choose this or the Texas Spend Option. Commercials, reality TV, instructional or educational videos, and video games must choose the spend option. Above cast and crew restriction could be waived if the Texas Film Commission determined that qualified crew were not available. Only the first \$1m in compensation per employee could be claimed. $\geq$ \$250k in expenditure required, or \$100k for commercials, education or instructional videos, or video games.	33 TexReg 2019; 34 TexReg 6725; 2009 Ch. 2	
	01-Nov-09	27-Aug-11	5/10/15%‡ for all			2.5%¶				Texas Spend Option. Same restrictions as above apply		33 TexReg 2019; 34 TexReg 6725; 2009 Ch. 2
	28-Aug-11	-	5/10/15%‖ for all									36 TexReg 5201; 37 TexReg 5737

* +1.25% if at least 25% of the filming days occur outside the metro areas of Austin or Dallas-Fort Worth.
‡ +4.25% if at least 25% of filming days occur in an underutilized or economically distressed area.
† 10% if expenditure > \$1m, 15% if > \$5m. Commercials, reality TV, instructional or educational videos, and video games only receive 5% rate.
¶+2.5% if at least 25% of filming days occur in an underutilized or economically distressed area.
‖ Commercials, reality TV, instructional or educational videos, and video games now eligible for 10% and 15% rates.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
UT	01-Jan-09	09-May-11	Up to 20%	Up to 20%	Up to 20%	N/A		Rebate*		Max. benefit of $0.5m if rebate chosen over tax credit.	§63M-1-1802 et seq.	Laws 2009, c. 135
	10-May-11	-				5%†				≥ $200k expenditure required.		Laws 2011, c. 338
VT	01-Jul-06	26-May-11	Up to 10%	Up to 10%	Up to 10%	N/A		Grant		Can only claim the first $1m in compensation per employee. ≥ $1m expenditure required.	10 V.S.A. Ch. 26 §§651-651g	Laws 2006, No. 184, repealed by Laws 2011, No. 52
VA	01-Jan-11	-	15%	25/35%‡	15%	5-15%¶	Yes	No	No	Can only claim the first $1m in compensation per employee. ≥ $250k expenditure required.	§58.1-439.12.03	Acts 2010, c. 419; Acts 2010, c. 599
WA	01-Jul-06	19-Mar-08	20%	20%	20%	N/A		Rebate		≥ $0.5m expenditure required for a feature film, $300k for a TV episode, $250k for an infomercial or commercial. Max. benefit of $1m per project.	82.04 RCW	Laws 2006 Ch. 247
	20-Mar-08	28-Mar-12	Up to 20%	Up to 20%	Up to 20%					Min. expenditure for infomercials and commercials reduced to $150k.		Laws 2007-2008, Ch. 85
	15-Apr-09	29-Mar-12	Up to 30%	Up to 30%	Up to 30%							Laws 2009, Ch. 100
	29-Mar-12	-	Up to 30%‖	Up to 30%‖	15%	5%◇						2012 Ch. 189

* Can choose either a cash rebate or a tax credit. The tax credit is neither refundable, transferable, nor has a carry forward.
† +5% if a significant percentage of cast and crew are from UT and certain promotion obligations are met.
‡ 25% if expenditure < $1m, 35% otherwise.
¶+5% for filming in an economic distressed area. +10% for compensation for VA residents employed for the first time as actors or crew.
‖ Only up to 15% for commercials, unless the production company is based in WA, then 25%. Documents summarizing this incentive mention that resident labor always gets the 30% rate.
◇ Up to 35% for a TV series that films at least six episodes.

			Expenditure Rates									
	From	To	In-State Non-Labor	Resident Labor	Non-Resident Labor	Bonus Rates	Refundable	Transferable	Carry Forward	Rules & Restrictions	Statute	Act
WV	01-Jan-08	07-Mar-08	27%	27%	0%	2-4%*	No	No	2 Years	$\geq$ \$25k expenditure required.	§11-13X-1 et seq.	2007 Ch. 117
	01-Jan-08	03-May-09				4%†		Yes				2008 Ch. 107
	01-Jan-08‡	-			27%¶							2009 Ch. 102
WI	01-Jan-08	31-Dec-08	25%	25%	0%	N/A	Yes	No	No	$\geq$ \$100k for $\geq$ 30 min. production, otherwise \$50k. Can only claim up to \$25k per employee, and cannot claim to top two earners.	§71.07(5f)	2005 Wisconsin Act 483
	01-Jan-09	-								$\geq$ \$50k expenditure required. Top two earners rule replaced with rule stating that any employee with compensation $>$ \$250k cannot be claimed. Can only claim up to \$20k per employee. Max. benefit of \$0.5m. $\geq$ 35% of the production budget must be spent in WI.		2009 Wisconsin Act 28; 2009 Veto Notes
WY	01-Jul-07	26-Feb-09	12%	12%	0%	1-3%‖		Rebate		$\geq$ \$0.5m expenditure required.	W.S. 9-12-402 et seq.	2007 Ch. 73
	27-Feb-09	-								$\geq$ \$200k expenditure required.		2009 Ch. 74

* +2% if $\geq$ ten WV residents were employed full-time. +2% if $\geq$ of full-time employees were WV residents.
† +4% if $\geq$ ten WV residents were employed full-time.
‡ These changes applied retroactively to January 1, 2008, but this legislation was not approved until May 4, 2009.
¶Rule changed to include those who are subject to WV income tax, and not those who are residents.
‖ Must use WY props and product placement to achieve 13% rate. Must providing behind the scene footage highlights to achieve 14%. Production must be set in WY to achieve 15%.