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The Diffusion of State Film Incentives: A Mixed-Methods Case Study

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Abstract

In 2000, only six states had tax incentives for film and video production, and by 2010, *all but* six states had film incentives. What accounts for this growth in popularity? This study combines quantitative event history analysis and qualitative interview methods to try to understand why states adopted film incentive programs and how they were influenced by the adoption of incentives in other states. The analysis suggests that the diffusion processes in state adoptions of film incentives can be largely explained by two factors: (a) the size and sophistication of the existing film industry in the state and (b) a competitive "bandwagon" effect based on the total number of states that had already adopted film incentives. The results emphasize the need to broaden the ways that competitive influences can be conceptualized and modeled in policy diffusion research, especially in economic development.

Keywords

state economic development policy, tax incentives, state film incentives policy diffusion, event history analysis

In 2000, only six states had programs to provide financial incentives for the television and movie industry to shoot and produce films in their states. By the end of 2010, *all but* six states had enacted film incentive legislation. Film incentives were widely touted as a highly visible and highly effective economic development tool. In the past few years, however, many states have experienced what one commentator has called "buyer's remorse," cutting or eliminating film incentive programs as budgets remained tight and incentives were not producing the hoped-for levels of jobs and investment (Lemov, 2014). No new incentive programs have been adopted in the past 6 years, and as the interviews described below attest, even members of the film industry have argued that states should stop engaging in these so-called economic development wars.

Perhaps the film incentives fad has finally burned itself out. It is important, however, that we critically examine the diffusion of film incentives so that we may learn lessons about how economic development ideas, particularly those that are subsequently abandoned, spread among states. Why did states adopt film incentives in the first place? The pattern of widespread adoption in such a short time is suggestive of a diffusion process in which the adoption of incentives by one state influences whether other states also adopt incentives. Therefore, this study uses the ideas and tools of the policy diffusion and tax competition literatures to examine the nature of the diffusion process for the case of state film incentives. First, elite interview data are examined to identify factors that led to the adoption of incentives in three states: Michigan, Washington, and Mississippi. These interviews suggest multiple possible channels of diffusion between states. For example, interviewees from Washington and Mississippi noted that they were primarily influenced by the adoption of incentives by their geographic neighbors. Michigan, however, viewed itself as competing equally with all 49 other states. In addition, the interviews also suggest that an important channel of diffusion was communication and competitive pressures within the film industry itself, rather than information exchange among policy makers, as is often assumed in policy diffusion models.

Drawing on the interview data and the policy diffusion literature, the study then develops hypotheses about the diffusion of film incentives that can be modeled and tested using quantitative data on all U.S. states. The results suggest that there were two important diffusion-related predictors of film incentive adoption: (a) the size and sophistication of the existing film industry in the state and (b) a competitive "bandwagon" effect based on the number of states that had already adopted film incentives. The results provide only weak evidence that states are influenced by their geographic neighbors. The final section of the study discusses the implications of this study's findings for future studies of policy diffusion, especially in the areas of economic development and tax competition. It emphasizes the need to broaden the

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ways in which competitive influences can be conceptualized and modeled in policy diffusion.

State Film Incentives

To a greater or lesser extent, state and local governments have long been in the business of trying to attract filmmakers. By the late 1980s, most states had created official state film commissions or offices, tasked with coordinating those recruitment efforts. During these years, states relied primarily on offers of in-kind aid and tax exemptions to entice filmmakers (Christopherson & Rightor, 2010). For example, state film offices often provided location scouting services, public relations services, free use of public facilities, and permits, as well as exemptions from various taxes, including sales and use taxes and hotel taxes. While most state efforts were on a scale that had little impact on location decisions for the film industry, some states, notably North Carolina and Texas, were more aggressive and quite successful in recruiting filmmakers (Overton, 1993).

The decade of the 1990s saw continued policy innovation in efforts to attract film activity. In 1992, Louisiana became the first state to offer refundable tax credits for broadly defined production expenses, equivalent to a direct subsidy for the industry. Between 1997 and 1999, the Canadian federal government and most of the provincial governments also adopted tax-credit-style film incentives (Christopherson & Rightor, 2010). Many have suggested that the Canadian incentives, combined with a favorable exchange rate during the same period, led to an increase in film activity in Canada and other locations outside the United States (see McDonald, 2011). This problem of "runaway production" may have motivated states to adopt their own film incentives to try to lure filmmakers back to the United States. In fact, Oklahoma, one of the earliest states to adopt film incentives in 2001, titled its legislation the 2001 Compete with Canada Film Act (SB 674).

The recent growth in popularity of incentive-based economic development policy is not unique to the film industry. As Markusen and Nesse (2007) explain, over the past few decades, incentive-based competition has proliferated both inside and outside the United States. They argue that increased competition has been hastened by the rise of professional site consultants who broker incentive deals, the increased devolution of economic development policies from national to subnational governments, and the enhanced geographic mobility of business. Each of these factors tends to tilt bargaining power away from governments and toward industries, especially highly mobile ones like the film industry. Thus, state and local governments on the front lines of economic development face significant pressure to adopt incentives.

Table 1 lists the years that each state first adopted a major film incentive program—one that includes tax credits or subsidies—and Figure 1 shows the corresponding cumulative proportion of states adopting film incentives over the course of the study. The S-shape in the plot in Figure 1 is typical of a diffusion process (F. S. Berry & Berry, 2007). After Louisiana, other states began adopting incentives in 1997, the same year that the Canadian federal government adopted its tax credit program. The rate of adoption accelerated thereafter and peaked in 2006, when 11 states adopted film incentive programs. This pattern is illustrated in Figure 1, which reaches its steepest point in 2006. After 2006, the adoption rate slowed, and since 2009, no states have adopted new film incentive programs, leaving only six states having never adopted one.

Table 1. Adoptions of State Film Incentives by Year.

Year	Adopters	States
1992	1	LA
1997	3	AR, HI, MN
1998	1	MO
1999	1	VA
2000	0	—
2001	1	OK
2002	1	NM
2003	2	FL, IL
2004	4	MS, NY, PA, SC
2005	8	AZ, GA, MA, MD, MT, OR, RI, UT
2006	11	CO, CT, ID, ME, MI, NC, NJ, TN, SD, WA, WI
2007	5	IA, KS, TX, WV, WY
2008	2	AK, IN
2009	4	AL, CA, KY, OH
2010	0	—
Total	44	
Never adopted	6	DE, ND, NE, NH, NV, VT

Note. The special character "—" means no states adopted incentives that year.

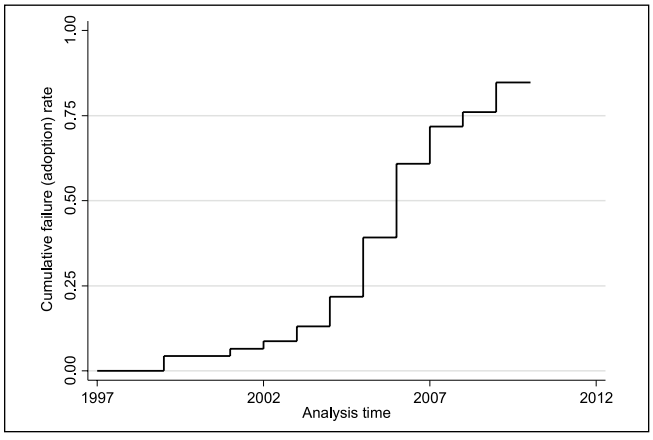

Figure 1. Kaplan–Meier cumulative failure plot for state film incentive adoptions.

While "runaway production" to Canada may have provided the initial impetus for the adoption of incentives in the United States, many have suggested that the widespread adoption of film incentives was driven more by interstate competition, rather than international competition. For example, McDonald (2011, p. 102) argues that "the weapon [of state film incentives] is not currently employed to protect the nation, but it is being used by states to fight each other." During the 2000s, not only did more states adopt film incentives but their generosity also grew (Button, 2014). In 2002, Louisiana dramatically expanded its film credit program, and New Mexico adopted a credit for 15% of production expenses, which it later increased to 25%. By 2008, Michigan's program had a 40% rate, the highest of any state.

Meanwhile, as Christopherson and Rightor (2010) describe, studies of the net fiscal impact of film incentives by state agencies have generally agreed that film incentives have a net negative impact on tax receipts. For example, an analysis by the Louisiana Legislative Fiscal Office finds that for each dollar of film credit cost, only 16 to 18 cents of revenue from additional economic activity is created (Albrecht, 2005). In terms of economic impacts on job creation, investment, and tourism activity in states, aside from reports commissioned by film incentive advocates, studies have largely failed to find conclusive results (Christopherson & Rightor, 2010). Examining film industry employment at both the state and national levels, Adkisson (2013) finds evidence that despite gains and losses in individual states, there was no net gain in national film industry employment between 1997 and 2011, suggestive of a classic zero-sum game. Of course, it is impossible to know whether there might have been a net decline in national film activity if states had not adopted film incentives. Nevertheless, despite a lack of evidence on the economic net benefits of film incentives, 44 states adopted them in rapid succession, providing nearly $6 billion worth of incentives between 2000 and 2010 (Henchman, 2011).

Economic development policy researchers and professionals should be concerned to see film incentives—a policy of dubious effectiveness—become so popular and widespread. We know very little about the interstate competitive dynamics at play with the use of economic development incentives. Who is competing with whom and why? For some initial insight into these questions, the next section draws on the literatures in policy diffusion and tax competition.

Policy Diffusion and Tax Competition

Starting with the earliest studies of Walker (1969) and Gray (1973), scholars have tried to model and understand how policies diffuse among governments (see F. S. Berry & Berry, 2007, for a review). Policy diffusion is a process that Strang (1991, p. 325) concisely defines as "any process where prior adoption of a trait or practice in a population alters the probability of adoption for remaining non-adopters." Therefore, diffusion excludes the process of coincidental policy convergence, in which states act independently but happen to arrive at similar policies. While policy diffusion researchers have largely left questions of tax policy and tax incentives to the tax competition literature in economics (Shipan & Volden, 2012), existing work includes studies of the adoption of state income and sales taxes (F. S. Berry & Berry, 1992), enterprise zones (Mossberger, 2000), sales tax exemptions (Fletcher & Murray, 2006), and different types of business tax incentives (Hearn, Lacy, & Warshaw, 2014; Leiser, 2015; Miller & Richard, 2010; Omer & Shelley, 2004).[1]

Policy diffusion models posit a wide variety of diffusion mechanisms, including learning, competition, imitation, coercion, common norms, and "taken-for-grantedness," among several others (Braun, Gilardi, Füglister, & Luyet, 2007; Shipan & Volden, 2008). These broad categories also often have several subcategories. For example, Kenyon (1997) catalogs six different theories of interjurisdictional competition, including the Tiebout model and yardstick competition. As Kenyon (1997) notes, one issue that all theories of competition must contend with is how a state defines who its competitors are. In both the policy diffusion and tax competition literatures, competitor governments are usually specified according to context-specific relationships between states, such as the sharing of a border, the locations of specific industries, or some other similarity (W. D. Berry & Baybeck, 2005; Kenyon, 1997).

Influence from geographic neighbors is one of the most common diffusion patterns specified in policy diffusion studies, say F. S. Berry and Berry (2007). Similarly, in the tax competition literature, Rork (2003) finds evidence that state tax rates are influenced by tax rates among geographic neighbors. In examining the adoption of state research and development (R&D) tax credits, Miller and Richard (2010) construct a composite measure of similarity between states, accounting for population, patent activity, manufacturing share, and income. They find that the adoption of an R&D credit by a "similar" state decreases the likelihood of a nonadopter adopting an R&D credit. Fletcher and Murray (2006) examine several state sales-tax-base exemption policies and find that states are influenced by different sets of "competitor" states, depending on the specifics of the policy under consideration.

Formally, these competitive relationships can be summarized as examples of a "heterogeneous mixing process" in which the probability that a certain prior adopter influences a certain nonadopter is a function of the "distance" between the two (Strang, 1991). That distance can be measured geographically, politically, economically, or otherwise. In this framework, the key to understanding a competitive diffusion process is understanding which distance measure states use to define their competitors.

Table 2. Summary of Interview Results: Factors Affecting Adoption of Film Incentives in Selected States.

	Michigan	Washington	Mississippi
Nature of interstate influence	Nationwide competition	Regional competition (with OR and BC)	Regional competition (with LA)
Other key factors	• Legislative sponsor with ties to industry • Film commissioner with extensive experience • Actively supportive governor • Economic distress	• Industry advocacy group organized to promote incentives • Legislative sponsor with ties to industry	• Film commissioner with extensive experience • Framing as an economic development issue • Legislative supporters with ties to industry

Interview Findings and Hypothesis Generation

This study uses a multimethod approach to exploring the nature of the diffusion process for state film incentives. The first part of this research consists of qualitative case studies of film incentive adoption in three states. Elite interviews were conducted with policy makers and other stakeholders involved in the adoption of film incentives in their respective states. The interviews were semistructured and open-ended elite interviews, which treat interviewees as experts and allow them to provide their own understanding of events (Leech, 2002). Interviewees reported about what they thought were important factors in the adoption of film incentives in their states, including whether they were influenced by the adoption of incentives elsewhere. Specific interview questions are provided in the appendix (Box A1). Following the suggestion of Beamer (2002), the interview data are triangulated with secondary data sources, such as official records, newspaper articles, and other interviews, to maximize reliability.

The three states in the sample were Michigan, Washington, and Mississippi, covering a broad range in the timing of adoption. Of the 43 total adopters, Mississippi was the 10th state to adopt film incentives, doing so in 2004; Washington was the 24th state to adopt incentives, doing so in 2006; and Michigan was the 32nd state to adopt incentives, doing so in 2006. The states in the sample were also chosen to exhibit variation in geographic, economic, and political characteristics as well. Both Washington and Michigan, though far apart, share a border with Canada, while Mississippi is in the South. Mississippi is generally smaller, poorer, and more politically conservative than the other two states. Washington is richer and more liberal than the other two states. Michigan has the largest population and the most professionalized legislature, but falls between Mississippi and Washington in terms of income and political ideology. Initial interviewees were selected in each state after reviewing legislative documents and newspaper articles that mentioned specific individuals as key players. From there, a "snowball sampling" method was used to identify additional interviewees. In total, 10 interviews in Michigan, 6 in Washington, and 3 in Mississippi were conducted with legislators, legislative staff, agency officials, lobbyists, and representatives from the film industry.

The results of the interviews are summarized in Table 2. As described above, understanding the diffusion processes involves identifying the channels of influence between adopters and nonadopters. In Washington, interviewees were very clear that Washington needed to adopt film incentives to counteract the loss of business activity to Oregon, which had adopted film incentives in 2004, and to British Columbia, which had adopted film incentives in 1997. Similarly, interviewees in Mississippi said that they were strongly influenced by Louisiana's film incentive program. For example, one lobbyist explained that in making the case to legislators, "It made sense to tell them what our neighbors were doing. You know your neighbors. Your neighbors are like you." Mississippi State Representative Diane Peranich argued that "Our sister states have been sites for a lot of film activity, and now we will be able to steal the march" (Lofton, 2004). In these cases, the degree of the influence of previous adopters over potential ones is determined by geographic proximity. That is, Washington was most greatly influenced by the actions of Oregon and British Columbia (and Mississippi by Louisiana) because they are geographic neighbors and presumably share characteristics that are important to film production, such as climate and scenery. This idea of regional influence leads to the first hypothesis:

> **Hypothesis 1:** States are more likely to adopt film incentives if their geographic neighbors have previously adopted film incentives.

Unlike Washington and Mississippi, the process of regional diffusion did not appear to be as strong of a factor for Michigan. None of the Michigan interviewees mentioned that they were influenced by the actions of regional states, and while some Michigan interviewees mentioned Canadian competition, they mentioned Vancouver as often as Toronto. What Michigan interviewees did report is that they felt they were engaged in competition with *all* other states, particularly those that offered the most generous and successful incentives. As one interviewee put it, "If you're not on the

top of these incentives—if you're not the best state—then you might as well not be in the business." In other words, they were as likely to see Florida or Arizona as a competitor as Indiana or Ohio. Therefore, there may be a kind of "bandwagon" effect, with states becoming more likely to adopt as the total number of adopters grows.

This bandwagon or nationwide effect is an example of a "homogeneous mixing process," in contrast to the heterogeneous mixing processes described above. Homogeneous mixing used to be a common assumption in policy diffusion studies (e.g., Gray, 1973) but has been largely abandoned in favor of heterogeneous mixing processes, such as regional influence (Strang, 1991). Homogeneous mixing models are common in epidemiology and assume that "noninfected" states (i.e., states that have not adopted incentives) are equally likely to be "infected" by any of the prior adopters. In other words, states care not *which* other states have adopted but *how many*. With an industry as mobile as the film industry, competition can be felt equally from any other state, and homogeneous mixing is a reasonable hypothesis. For example, one interviewee related a story of how Washington recently lost a major motion picture production to Alabama, a state with which it shares little in common geographically, politically, economically, or socially. A second diffusion hypothesis encompasses the idea of nationwide competition:

> **Hypothesis 2:** States are more likely to adopt film incentives the more other states have previously adopted film incentives.

These first two hypotheses are typical of policy diffusion studies, but the interviews suggest that there may be another diffusion mechanism at work. Policy diffusion is fundamentally about the flow of information and ideas between political jurisdictions, and it is usually implicitly assumed that this information flows at the level of policy makers, government actors, and others directly involved in government decision making. For example, Shipan and Volden (2012) explain that low-cost communication, low-cost travel, professional organizations, and informal personal networks facilitate the flow of information among policy makers in different states, often resulting in policy diffusion.

However, in the present case of film incentives, the flow of information in the film industry itself also appears to play an important role. In Washington, for example, the initial impetus for film incentive legislation came from the film industry. In 2004, a group of film industry leaders officially came together to form the Washington Entertainment Industry Players Association, whose goal and eventual accomplishment was to create a film incentive program in Washington state. One Washington interviewee explained that for film producers considering filming in a state, "The entrance into the conversation is 'What is the incentive available in this state, and how does that fit into my business model?'" They realized that if they wanted their industry to grow in Washington, an incentive program would be very important. Similarly, in both Michigan and Mississippi, the state film commissioners were lead players in developing and advocating for film incentive policies. They both had long tenures and were well connected to film industry leaders in other states. They were therefore well informed and well positioned to advocate for film incentives in their respective states.

In this way, the impetus to adopt film incentives results from the flow of information within the film industry, and from industry leaders advocating for incentives to their state policy makers. While policy makers may or may not have been aware of film incentives being adopted in other states, the flow of information among policy makers from different states is not a necessary condition for policy diffusion and the widespread adoption of film incentives. The next question becomes, "What accounts for the effectiveness of state film industries in advocating for incentives?"

The interviews suggest that the larger the existing film industry in a state, the greater political pressure there would be to adopt incentives, for three reasons. First, the larger and more sophisticated a state's film industry is, the more contacts it will have with film producers in other states, and the more likely (and quickly) it is to become aware of the growing importance of film incentives. Second, a larger industry translates to a larger political constituency and more political power to convince states to adopt incentives. Interviewees in both Michigan and Mississippi emphasized that legislators with familial or personal ties to someone in the film industry—which would be more common with a larger film industry in the state—became key supporters. Third, having a larger film industry means there is more at stake, in terms of the potential for losing film activity to other states or the potential for growing the existing industry base and creating agglomeration effects.

The interviews also frequently mentioned the importance of state film commissioners and commissions with experience and connections, both in the industry and in politics. For example, in the early 2000s, Michigan's film commissioner gained experience lobbying Congress for federal-level film incentives in the United States with a group called Film US, which was composed of several state and regional film commissioners. More experienced and well-connected film commissions were in a better position to play a leadership role in organizing the film industry's advocacy efforts for film incentives and were more likely to be aware of advocacy efforts in other states. Therefore, a third diffusion hypothesis that represents the idea of diffusion at the industry level is the following:

> **Hypothesis 3:** States are more likely to adopt film incentives the larger and more sophisticated their respective film industries are.

Table 3. Descriptive Statistics.

	1997—Start of risk (49 states)		2010 Adopters (42 states)		2010 Nonadopters (7 states)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Percentage neighbor adopters	1.36	5.47	82.97	26.33	90.48	16.27
Canadian border	0.22	0.42	0.19	0.40	0.43	0.53
Per capita GSP from film industry	65.12	116.21	76.62	133.14	26.71	17.65
Film commission age	17.16	13.27	31.74	13.32	16.43	13.75
Ideological distance	21.70	14.54	21.46	13.70	19.73	8.11
Unemployment rate	4.63	1.08	8.98	1.72	7.44	3.36
Per capita GSP ($000)	34.71	6.02	40.61	8.14	42.78	9.60
Corporate income tax (CIT) rate	6.94	2.81	6.47	2.85	6.63	3.07
Professionalism	18.38	12.16	18.34	12.13	19.56	12.97
Government ideology	45.61	20.56	53.08	25.64	51.43	22.80
Divided government	0.61	0.49	0.48	0.51	0.43	0.53

Note. GSP = gross state product.

Event History Analysis

Data

As F. S. Berry and Berry (2007) explain, event history analysis is well suited for testing hypotheses about policy diffusion patterns and has become the quantitative method of choice in the policy diffusion literature. Event history analysis is designed to explain the timing of certain events and to identify factors that make "failure" (in this case, adoption) likely. The quantitative data used in this study span the years 1996 to 2010 and are structured as discrete-time event history data.[2] The "start of risk," the time at which states are considered to be "at risk" of adopting film incentives as the result of a diffusion process, is specified as 1997, the first year that states began adopting film incentives after Louisiana's initial adoption.[3] Variable descriptions and sources are provided in the appendix (Table A1), and descriptive statistics for the independent variables are shown in Table 3. Statistics are shown for 1997, the start of risk, and for 2010, the end of the study period, with adopters and nonadopters separated for comparison.

To operationalize the hypothesis of regional influence, this study uses two variables to measure how states are influenced by their contiguous neighbors. The first variable measures the percentage of bordering states that have already adopted film incentives as of January 1 of each year.[4] The other is a dummy variable that indicates whether a state shares a physical border with Canada, which adopted film incentives at both the federal and provincial levels in the late 1990s, before the start of risk in this study. Increases in these two variables are expected to increase competitive pressures, increasing the hazard of adoption.

To operationalize the hypothesis of nationwide influence, a naive approach would be to include a variable that measures the total number of states previously adopting a film incentive policy. However, it is important to recognize that such a variable exhibits no variation across states at any given time, and therefore, such an effect would simply be absorbed into duration dependence, similar to time-fixed effects. Moreover, including such a variable that is highly collinear with time can result in inflated standard errors (Beck, Katz, & Tucker, 1998). Investigating the hypothesis of nationwide influence therefore requires inspecting duration dependence in the model. Because the number of adopting states increases over time, the nationwide influence hypothesis predicts positive duration dependence—the hazard should increase over time, holding other factors constant.

The third major hypothesis is that the size and sophistication of the existing film industry facilitates the adoption of film incentives. The size of the film industry is measured by per capita real gross state product (GSP) associated with the motion picture and sound recording industries. In the models estimated below, this variable is logged to help normalize its skewed distribution of values. This variable, as well as the other economic control variables described below, are also lagged 1 year to avoid problems of endogeneity and simultaneity bias. Larger existing film industries are expected to increase the hazard of adopting film incentives. To capture the sophistication and experience of state film commissions, another variable measures the number of years since a state's first official film commission or office was established. Having a film commission with a longer tenure is expected to increase the hazard of adopting film incentives.

The data also include several control variables, suggested both by the interviews and by the policy diffusion and tax competition literatures. To control for another possible channel of diffusion, Grossback, Nicholson-Crotty, and Peterson's (2004) measure of ideological distance is also included in the model. Ideological distance is intended to capture the level of ideological (liberal/conservative) similarity between a potential adopter and previous adopters, the presumption being that states are more likely to adopt a policy if it has already been adopted by states with similar ideological leanings. For example, conservative states may be more likely to adopt a policy if

they know other conservative states have already done so. Underlying ideology scores are from W. D. Berry, Fording, Ringquist, Hanson, and Klarner (2010) and are described in more detail below. Ideological distance is equal to the absolute value of the difference between the ideology of the potential adopter and a weighted average of the ideologies of all previous adopters (Grossback et al., 2004).[5]

A set of economic variables, including the unemployment rate, logged real per capita GSP, and the corporate income tax (CIT) rate, is included to control for state-specific economic characteristics. In Michigan, several interviewees attributed policy makers' willingness to adopt incentives to a sense of desperation in the face of unprecedented economic troubles, suggesting that states with high levels of unemployment or low levels of per capita GSP may be more willing to take risks in adopting incentive policies. As described above, these variables are lagged by 1 year. The CIT rate, measured as of January 1 each year, is also included as a proxy for the tax burden on business in each state. The higher the CIT rate, the more important tax incentives like film credits become to offset the tax burden.

Political variables are also likely to influence the adoption of film incentives. Squire's (2007) index measure of legislative professionalism is included to capture a state's "capacity . . . to generate and digest information in the policymaking process" (p. 211). Higher professionalism scores, as measured on a scale from 0 (*least professional*) to 100 (*most professional*), indicate that a state's legislature has more staff, higher pay, and more session days. Therefore, more professional legislatures can obtain, evaluate, and react to policy information faster than less professional legislatures. Although the interviews provide few clues about possible partisan aspects of the politics of film incentives, it is nonetheless important to account for partisanship. The model includes W. D. Berry et al.'s (2010) measure of state government ideology, which ranges from 0 (*most conservative*) to 100 (*most liberal*). This measure is an index of factors, including partisan affiliation and power in the governor's office and state legislature. Finally, a dummy for divided government is also included to account for the level of cooperation between governors and state legislatures. Several interviewees indicated that either overt cooperation or tacit consent between branches of government was important to facilitate the adoption of film incentives.

Results

A Cox proportional hazards model is used to predict the hazard[6] of adopting a film incentive for state *i* at time *t* as a function of a baseline hazard and covariate values. Formally,

$$h_i(t) = h_0(t)\exp(\boldsymbol{\beta}\boldsymbol{x}_{it} + \gamma z_i),$$

where $h_0(t)$ is the baseline hazard, $\boldsymbol{\beta}$ and γ are coefficients, $\boldsymbol{x}$ is a time-varying covariate, and z is a nontime-varying covariate (Canadian border dummy). In the Cox model, the baseline hazard (duration dependence) is estimated nonparametrically, giving maximal flexibility to its shape. For this reason, the Cox model is often preferred to other event history models where the baseline hazard is parameterized because parametric model results can be very sensitive to how the baseline hazard is specified (Box-Steffensmeier & Jones, 2004). In addition, the Cox model's proportional hazards assumption is statistically confirmed both for the model and for each variable using Grambsch and Therneau's (1994) method.[7]

Table 4. Cox Model Results for State Film Incentive Adoptions.

	Hazard ratio	Robust *SE*
Percentage neighbor adopters	0.987*	0.008
Canadian border	0.426***	0.125
Per capita GSP from film industry (ln)	1.520**	0.257
Film commission age	1.025**	0.011
Ideological distance	0.995	0.014
Unemployment rate	1.003	0.157
Per capita GSP (ln)	0.092***	0.080
Corporate income tax (CIT) rate	0.971	0.046
Professionalism	0.976**	0.011
Government ideology	1.011*	0.006
Divided government	0.725	0.287
N	418	
Log pseudolikelihood	−120.138	
Probability > chi-square	0.0000	

Note. GSP = gross state product. Standard errors (*SE*) are clustered by state. Includes all states except Louisiana.
*$p < .10$. **$p < .05$. ***$p < .01$.

Cox model estimates are reported in Table 4 and the kernel-smoothed Cox baseline hazard is plotted in Figure 2. The coefficients are reported as hazard ratios, which are interpreted similarly to odds ratios,[8] and standard errors are clustered by state.[9] Looking first at the regional influence variables, percentage of neighbors adopting and with a Canadian border, both coefficients are significant at least at $\alpha = .1$ and surprisingly less than one. This means that having a neighbor that adopted film incentives, whether another state or a Canadian province, reduces the hazard of adoption, all else being equal. For example, sharing a border with Canada reduces the hazard of adopting a film incentive by 57%, and a 1 percentage point increase in neighbors adopting reduces the hazard of adoption by 1.3%, controlling for other factors. One possible explanation is that states are acting as if there is a first-mover advantage. That is, if a state waits until its neighbors have already adopted film incentives, it may be too late to realize any of the benefit. Of course, the hazard ratio on the neighbors variable is only marginally significant ($p = .09$), so there is reason to be skeptical of this result.

The national influence hypothesis can be evaluated by inspecting Figure 2. If states become more likely to adopt incentives as the total number of adopters grows, we would

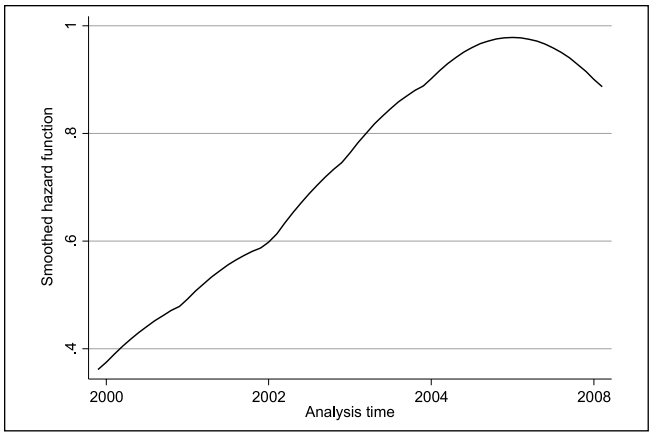

Figure 2. Cox baseline hazard for state film incentive adoptions.

expect to see positive duration dependence—an increasing hazard—after accounting for other explanatory factors. According to Figure 2, the hazard does appear to be increasing until about 2006, when it begins to decline. This decline might be explained in one of two ways. There may be some unmeasured factor that makes particular states "holdouts." For example, California may have been a holdout because it is one of the historical homes of the film industry and did not believe it needed incentives to remain competitive. Alternatively, the decline in the hazard may be explained by a perceived first-mover advantage, similar to the neighbor competition dynamic. Once a majority of states adopt film incentives, the comparative advantage of having incentives diminishes, reducing the urgency for new adoptions. In addition, as mentioned above, the average generosity of film incentives was also growing during the study period, so that by 2006, a state considering adopting a new incentive had to make it quite a bit more generous to make their incentive commensurate with those of other states. Perhaps remaining states simply were not willing to make the fiscal sacrifice. It is also important to remember that other exogenous time-varying factors, such as macroeconomic or macropolitical conditions, can affect states similarly, resulting in duration dependence. While exogenous sources of duration dependence cannot be ruled out, none of the interviewees mention any macropolitical or macroeconomic conditions as significant determinants of their states' decisions to adopt film incentives.

The results also show support for the hypotheses related to state-level film industries. Specifically, a 1% increase in per capita GSP from the film industry is associated with a 52% increase in the hazard of adoption, controlling for other factors. In addition, increasing the tenure of the state film commission by 1 year corresponds to a 2.5% increase in the hazard of adoption, all else being equal. Both effects are statistically significant at $\alpha = .05$.

Of the control variables, only per capita GSP, legislative professionalism, and ideology appear to be significantly associated with the hazard of adopting film incentives. As expected, a higher per capita GSP corresponds to a lower hazard of adopting film incentives, suggesting that poorer states—perhaps signaling economic distress—were more likely to adopt film incentives, all else being equal. The "economic distress" story is not supported, however, by the lack of significance of the unemployment rate coefficient. In addition, the lack of significance of the CIT rate coefficient suggests that policy makers are not more likely to adopt incentives to offset higher CIT burdens on taxpayers.

Turning to the political factors, the hazard ratio for legislative professionalism suggests that more professional states are less likely to adopt film incentives, controlling for other factors. Perhaps more professional legislatures, with more staff support, are more likely to be aware of the economic studies showing the lack of effectiveness of film incentives. Alternatively, perhaps they have the foresight to see the eventual demise of film incentives and avoided jumping on the bandwagon. Divided government does not appear to significantly influence the timing of adoption, suggesting that governor–legislator negotiations are not a time-consuming part of the political process in this case. The results also suggest that politically liberal state governments are slightly more likely to adopt film incentives: A one-point increase on the ideology scale predicts a 1.1% increase in the hazard of adoption, controlling for other factors. However, statistical significance is not particularly strong and none of the interviews suggested a strong partisan element in the political process of adoption. Moreover, the lack of significance of the ideological distance variable suggests that partisan ideology did not play a role in interstate influence. As others have noted, the partisan politics of tax incentives tends to be nuanced. On one hand, tax credits have historically been favorably viewed by conservatives who wish to reduce taxes for businesses (Bozeman & Link, 1984). On the other, the adoption of new tax expenditures runs counter to the conservative mantra of tax simplification—"broad base, low rate"—exemplified by major tax reforms during the Reagan administration (Slemrod & Bakija, 2008). Additional research is needed to continue to parse out the politics of tax incentive adoption.

Robustness Checks

To check whether the results of the Cox model are robust to alternative specifications, the data are reanalyzed using complementary log–log and logit models with the baseline hazard parameterized alternatively as a quadratic or logged function of time. These two specifications for the baseline hazard can accommodate the potential nonconstant and nonlinear shape of the Cox baseline hazard observed in Figure 2. Results are presented in the appendix (Table A2). Concerning the main hypotheses, these parametric models do not support the hypothesis of regional influence between states, as the hazard ratios on the neighbor's variables do not reach conventional

levels of significance in any of these four models. However, the estimated hazard ratios range from 0.986 to 0.992, in line with the Cox model results, suggesting that neighbor adoptions—if they have any effect at all—reduce the likelihood of adopting film incentives. It is therefore difficult to draw firm conclusions about diffusion between neighboring states when it comes to film incentives. However, the robustness check results for having a Canadian border are similar to the Cox model results, suggesting that having a Canadian border significantly reduces the hazard of adopting film incentives.

The cloglog and logit model results are consistent with the Cox model results regarding the other two main hypotheses. Evidence of statistically significant positive duration dependence is found in all four specifications, shown by the results for the time variables. What remains unclear is whether the baseline hazard begins to decline after 2006, as it does in Figure 2. In the models with quadratic duration dependence, coefficients for the quadratic terms were not significant, suggesting that a linear specification may better fit the data. Nevertheless, these results do exhibit significant positive duration dependence, adding additional support for the hypothesis of nationwide influence. Regarding the effects of film industry size, coefficients in the robustness checks are all significant ($\alpha = .05$) and of even larger magnitude than the Cox model results. Similarly, coefficients for film commission age are also significant and of a higher magnitude than the Cox results, providing additional support for the hypotheses of industry influence. Robustness check results for the remaining control variables are highly comparable to the main Cox model results both in terms of significance and magnitude.

Discussion and Conclusions

How did film incentive policies diffuse among states? The two most important factors seem to be (a) the size and sophistication of a given state's existing film industry and (b) how many states had already adopted film incentives. This study tests three hypotheses about the possible state-to-state diffusion processes underlying the spread of state film incentives and finds substantial support for two of them. The results suggest that states were influenced to adopt film incentives simply by the total number of previous adopters. In other words, there was a nationwide competitive bandwagon-style diffusion process. Perhaps states saw adoptions by other states as signals that film incentives are good policies, perhaps they wished to replicate the perceived success of early adopters, or perhaps they felt increased pressure to keep their existing film business from leaving for other states. Whatever the reason, what mattered to states was not which states, exactly, had already adopted incentives, but how many.

The results also emphasize the importance of the film industry itself. They show that even small increases in the size of a state's existing film industry translate to large increases in the hazard of adoption. In addition, a more well-established film commission also appears to facilitate adoption. This means that state film industries were highly successful advocates for a policy that would directly benefit them, and they drew on their size and experience to exert political influence on state politics. The interviews from Washington, Michigan, and Mississippi further suggest the film industry also served as the conduit for the diffusion of state film incentives. In all three interview states, the industry played a major role in advocating for legislation and forging ties with influential policy makers. Film industry leaders were simply responding to increased competitive pressure resulting from the adoption of film incentives in other states and Canadian provinces. States with larger film industries and more experienced film commissions adopted film incentives more quickly, not only because a larger industry creates a larger constituency with more political power but because the larger, more sophisticated industries probably caught on to the trend of film incentives faster.

The results do not provide strong evidence of regionally based policy diffusion in which states are influenced by their neighbors. While a marginally significant effect of neighboring adoptions is found in the main results, the effect is not replicated in robustness checks. Moreover, in the main results, the coefficient for the neighbor's variable suggests that increased adoptions among neighbors reduce the hazard of adopting film incentives, controlling for other variables. The role of regional diffusion, therefore, is unclear. If indeed having neighbors adopt a policy reduces a given state's hazard, it could suggest that states perceive a first mover advantage at the regional level—that is, the gains dissipate and the urgency to adopt falls as more nearby states adopt film incentive policies.

The diffusion processes suggested by this study of film incentives downplay the role of heterogeneous mixing diffusion channels so prominent in the literature—neighbor-to-neighbor diffusion, ideological distance, and other measures of "similarity." While there is certainly evidence to support these types of diffusion in other policy areas, this study provides a reminder that it is important to consider a broader possible scope of diffusion mechanisms and modeling strategies, including nationwide competition/bandwagons (i.e., homogeneous mixing) and diffusion through stakeholder networks rather than through policy-maker networks. These lessons are especially important to keep in mind when studying cases of diffusion in tax policy and economic development incentives, which almost always have elements of complex competitive dynamics.

At a practical policy level, what is relevant and even alarming about this study of film incentives is that, despite a lack of clear evidence on the economic effects of film incentives, 44 states adopted them in rapid succession, generating about $6 billion worth of incentives (Henchman, 2011). This study suggests that state decisions to make this fiscal sacrifice were strongly influenced by an outside interest group and a competitive bandwagon-style political trend. The public hopes that policy makers adopt policies only after thorough study and careful consideration have

shown that the policy would be beneficial to the public in a specific state. Information about adoptions in other states, as well as testimony and analysis from incentive beneficiaries such as the film industry, should certainly be part of this analysis but should not be given too much weight compared with state-specific factors and impartial analysis. Given the general conclusion that film incentives have failed to meet expectations of economic effectiveness, there are two possibilities: (a) state policy makers exercised "due diligence" in performing their research and were simply wrong about film incentives or (b) lacking adequate research, state policy makers relied too heavily on industry promises and fell prey to a bandwagon wave of popularity. This study's finding that more professional legislatures—which have more resources to undertake rigorous research—were less likely to adopt film incentives supports the latter view.

In either case, states need enhanced resources for the evaluation and negotiation of tax incentive policies. A few policy research organizations, including the Pew Charitable Trusts, the Tax Foundation, and Good Jobs First, have started to fill the gap in promoting transparency, analysis, and recommendations for best practices for state tax incentives. Pew, in particular, has focused its efforts on trying to help states evaluate the economic and revenue impacts of tax incentives (see Pew Charitable Trusts, 2015, 2016). The Governmental Accounting Standards Board has also recently adopted Statement No. 77, which requires state and local governments to disclose on their financial statements certain types of tax incentives they have been awarded, likely including many film-related incentives.

States should also expand their own institutional supports for evaluating tax incentives, including resources for research—well-trained staff, data reporting requirements about incentives that are approved, and nationwide professional networks for research staff. Without the support of the best information and research, states have little to no bargaining power in negotiating incentive deals with industries. Congress or federal courts could also intervene by limiting or banning certain types of economic development incentives. In the interviews conducted for this study, several policy makers described experiencing angst because they felt compelled to adopt incentives against their better judgment. As one explained, "I would certainly hope that there would be a time when every state would unilaterally disarm from the use of tax incentives, and the federal government came in and set a federal standard."

Appendix

Additional Detail on Data Sources and Robustness Checks

Table A1. Variables and Data Sources.

Variable	Description	Data source
Dependent variable: film incentive adoption dates	Year of adoption of first state film incentive program	Author—state statutes
Percentage of neighbor adopters	Percentage of bordering states that have already adopted incentives (AK and HI are coded 0 throughout)	Author calculations
Canadian border	Dummy variable where 1 = state shares a border with Canada	Author
Per capita GSP from film industry (ln)	Natural log transformation of per capita real GSP (2005 dollars) associated with the "motion picture and sound recording industries" for each state	BEA
Film commission age	Number of years since a film commission or film office was first established by the state (coded 0 if no film commission/office)	Author—various sources
Ideological distance	ABS ([(MostRecentAdopterIdeology + AllOtherAdoptersIdeology)/2] − PotentialAdopterIdeology)	Author calculations based on Grossback et al. (2004), using government ideology measures (see below)
Unemployment rate	Annually averaged unemployment rate for each state	BLS
Per capita GSP (ln)	Natural log transformation of per capita real GSP (2005 dollars) by state	BEA
Corporate income tax (CIT) rate	Top state corporate income tax rate. States without a corporate income tax rate are coded as 0.	Tax Foundation, Council of State Governments
Professionalism	Index of state legislative professionalism × 100. Raw scores range from 0.0 (*least professional*) to 1.0 (*most professional*). Annual scores are interpolated or extrapolated from Squire's (2007) data.	Squire (2007)
Government ideology	W. D. Berry et al.'s (2010) *NOMINATE* measure of the partisan ideology of state governments using. Scores range from 0 (*most conservative*) to 100 (*most liberal*).	W. D. Berry et al. (2010)
Divided government	Dummy variable where 1 = a single party does not control the governorship and both branches of the legislature	Klarner (2013) State Partisan Balance Data http://www.indstate.edu/polisci/klarnerpolitics.htm

Note. GSP = gross state product; BEA = U.S. Bureau of Economic Analysis; BLS = U.S. Bureau of Labor Statistics.

Table A2. Cloglog and Logit Model Results for State Film Incentive Adoption.

	Complementary log–log				Logit			
	Quadratic time		Logged time		Quadratic time		Logged time	
	Hazard ratio	Robust *SE*	Hazard ratio	Robust *SE*	Hazard ratio	Robust *SE*	Hazard ratio	Robust *SE*
Percentage neighbor adopters	0.987	0.011	0.991	0.009	0.986	0.011	0.992	0.010
Canadian border	0.343**	0.158	0.378**	0.167	0.306**	0.146	0.359**	0.169
Per capita GSP from film industry (ln)	1.630**	0.331	1.556**	0.326	1.700**	0.388	1.596**	0.378
Film commission age	1.034**	0.014	1.034**	0.014	1.035**	0.017	1.034**	0.016
Ideological distance	1.002	0.022	1.003	0.022	0.999	0.024	1.000	0.024
Unemployment rate	0.814	0.114	0.822	0.108	0.801	0.126	0.821	0.124
Per capita GSP (ln)	0.070*	0.101	0.095*	0.136	0.055*	0.083	0.082*	0.124
Corporate income tax (CIT) rate	0.959	0.058	0.959	0.058	0.950	0.062	0.952	0.062
Professionalism	0.979*	0.013	0.981	0.013	0.976	0.014	0.980	0.014
Government ideology	1.017*	0.009	1.016*	0.009	1.017*	0.009	1.016*	0.009
Divided government	0.746	0.374	0.787	0.402	0.734	0.418	0.786	0.448
Time	3.326**	1.875			3.220**	1.873		
Time 2	0.962	0.032			0.966	0.034		
Ln (time)			41.066***	54.270			43.090***	58.739
Constant	1.046	6.016	0.180	0.884	3.110	18.654	0.301	1.569
N	418		418		418		418	
Log pseudolikelihood	−97.3532		−99.6567		−98.1371		−100.436	
Probability > chi-square	0.0015		0.0628		0.002		0.1097	

Note. GSP = gross state product. Standard errors (*SE*) are clustered by state. Includes all states except Louisiana.
*$p < .10$. **$p < .05$. ***$p < .01$.

Box A1. Interview Questions.

1. Tell me about your role in your state's adoption of film incentives.
2. Where did the initial idea for film incentives come from?
3. Why did the legislature decide to take up the film incentives?
4. How were the details of the incentives policy decided upon?
5. What types of arguments were made (and by whom) in support or in opposition?
6. Why do you think these incentives were adopted when they were? (i.e., why didn't it happen sooner, later, or not at all?)
7. Anywhere in this process, did you hear about what other states were doing?
8. Anywhere in this process, did you seek out information about what other states were doing?
9. Which states? Why those?
10. What types of information and where did you get it?
11. How did (didn't) this information influence the political process or content of the film incentive program?

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Notes

1. In addition, Sewordor and Sjoquist (2016) just published a study of the adoption of state film incentives. Although conducted concurrently, Sewordor and Sjoquist's research is unrelated to the current study and focuses on different explanatory hypotheses. For example, they examine the role of fiscal stress and define "neighboring" states in terms of their similarity in film employment.
2. Similar to panel data, each row of event history data includes variable values for a particular state in a particular year. The dichotomous dependent variable indicates whether a given state adopted a film incentive in a given year. Unlike panel data models, however, in event history data, once an individual "fails" (i.e., once a state adopts an incentive), it is dropped from the data set and no longer observed. Therefore, early adopters contribute fewer observations to the data than either later adopters or nonadopters.
3. It is customary for the first adopter (Louisiana) to be omitted in policy diffusion models because the first adopter could not have been influenced by adoption in other states. It does not become a process of diffusion until there is at least one adopter. Since Louisiana adopted its incentive in 1992, the years between 1993 and 1996 could arguably be specified as the start of risk. However, the partial likelihood of the Cox model is only defined for years in which there is a failure. In

other words, data for the years 1993 to 1996 contribute no information to the likelihood and do not increase *N* (Box-Steffensmeier & Jones, 2004). Therefore, the results would be unaffected by moving the start of risk between 1993 and 1996.

4. Alaska and Hawaii are coded as "0" throughout. I use the percentage of border states adopting instead of the number of border states adopting because not all states have the same number of contiguous neighbors. Therefore, I expect an adoption by a border state to have a larger impact on a state with, for example, just two neighbors as opposed to a state with six neighbors.
5. The most recent adopter is given a 50% weight and the other 50% encompasses all other previous adopters. Results of the models reported below are robust to alternative specifications of ideological distance, including giving all prior adopters equal weight and squaring the difference instead of using the absolute value.
6. The hazard is the conditional probability of failure—the probability of failure given that the observation has not already failed.
7. An important feature of the Cox model is the proportional hazards assumption, which implies that the estimated effects of covariates are constant over time. As Box-Steffensmeier and Zorn (2001) explain, the proportional hazards assumption is frequently violated in political data, leading to biased estimates and incorrect standard errors. In this study, there is no evidence of time-varying effects for any of the covariates in the model.
8. A hazard ratio greater (less) than one indicates that a unit increase in the covariate is associated with an increase (decrease) in the hazard of adopting a film incentive, all else being equal.
9. Reported results are nearly identical when models are run without clustered standard errors.

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