



An Economic Analysis of the Arkansas Film Production Industry: Impacts and Incentives

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Executive Summary

The Arkansas Film Commission, a division of the Arkansas Economic Development Commission, requested that the Arkansas Economic Development Institute conduct a study to assess the economic impact of the film industry in Arkansas, as well as to consider the efficacy of the state's incentive programs. This report summarizes the findings of the study.

We examined the expenditures of four motion picture projects produced in Arkansas between 2021 and early 2023. In total, the four projects qualified for tax incentives of almost exactly \$1 million (\$998,872). Extrapolating from this sample, we therefore conclude that \$1 million in tax incentive payments is associated with

- Total spending by the motion picture production industry of \$4.60 million.
- Direct impact on value-added (state GDP) of \$2.71 million, with indirect and induced effects adding an additional \$1.35 million, for a total impact of \$4.06 million.
- Direct effects on Arkansas personal income of \$1.07 million, with an additional \$640 thousand in indirect and induced impacts, for a total of \$1.71 million.
- Direct employment of 24.2 full-time equivalent employees, with support for additional employment of 14.1 from indirect and induced effects, for a total employment impact of 38.3 jobs.
- State and local tax revenue of \$358.7 thousand, including
 - State income tax: \$73.7 thousand
 - Other state taxes: \$207.5 thousand
 - County and local taxes: \$77.6 thousand

Total production costs of \$4.60 million can be broken down into several distinct categories of spending, each of which has its own unique set of economic impacts:

- Expenditures on goods and services: \$1.97 million (43%)
 - Payroll: \$2.62 million (57%)
 - Out-of-state residents: \$1.55 million
 - Arkansas residents: \$1.07 million
- Total direct taxes paid (excluding income/payroll taxes): \$89.0 thousand

Simulations of the four projects independently revealed significant differences among their relative economic impacts. The magnitudes of secondary effects were related to differences in the projects' spending patterns:

- Payroll spending to in-state employees has direct one-for-one impacts on income and value added, while payrolls for out-of-state employees affect only value-added.
- Spending on post-production and other expenses that represent feedback into the motion picture production industry generate no impacts if contracted with an out-of-state firm. If the feedback spending goes to Arkansas firms, each \$1 million of spending through this channel returns \$176 thousand in indirect and induced impacts on income, \$556 thousand in value added, and supports employment of 4.3 employees (full-time equivalent)
- Spending on other goods and services has somewhat larger impacts. For each \$1M spent, the indirect and induced effects generate impacts on income in the range of \$290 thousand to \$352 thousand, with value-added boosted by \$542 thousand to \$630 thousand, and supporting employment buy about 7 jobs (full-time equivalent)

As a standardized metric for return on investment to the state's tax incentive program, we consider the economic impacts on income (plus income tax collected on out-of-state wages and salaries) per \$1,000 of rebate payment claimed. For the four projects in total, this measure of return is \$1,748. For the four projects independently, returns range from \$1,055 to \$2,591. If we consider the lowest-return project as an outlier, a 'typical' return would be approximately \$2,000.

Evaluating the efficacy of the tax incentive program, the Digital Product and Motion Picture Industry Development Act of 2009, we find that it has generally been successful at meeting the objectives expressed in its legislative intent section.

- The program has helped to support and sustain a film production industry in Arkansas.
- Growth in the industry has been minimal, however, and sustenance has required ongoing tax incentives.
- The simulation results presented in this paper provide information that we hope can be relevant for assessing the program relative to its opportunity cost.

We are skeptical about the more recent amendments to the Act.

- Adding tax incentives for hiring veterans provides only marginal value to the incentive package and is orthogonal to legislative intent.
- Raising the production-cost incentive to 25%, while leaving a cap of 30% on the total tax incentives for any expenditure
 - Reduces the incentive value for hiring below-the-line, in-state employees
 - Renders the other new offers for tax credits ineffectual.

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Introduction

Arkansas has a rich history of film production, dating back to the 1920s.¹ In fact, the 1938 movie classic *Gone with the Wind* included one view from Arkansas.² More recently, the State of Arkansas, like many other states, has made an effort to support the growth of the filmmaking industry by offering economic incentives. The Motion Picture Incentive Act of 1997, the Digital Product and Motion Picture Industry Development Act of 2009, and subsequent amendments in 2021 and 2023 have created a system of rebates and tax credits intended to support the production of a film and digital content industry in Arkansas.

The Arkansas Film Commission, a division of the Arkansas Economic Development Commission, requested that the Arkansas Economic Development Institute (AEDI) conduct a study to assess the economic impact of the film industry in Arkansas, as well as to consider the efficacy of the state’s incentive programs. This report summarizes the findings of the study.

Specifically, the Film Commission provided AEDI researchers with detailed expense accounts for four recently completed projects, two in Northwest Arkansas and two in Central Arkansas. Using this information, we estimated their overall economic impact using a version of the IMPLAN model calibrated to the Arkansas economy and customized to the motion picture production industry. The results of those simulations/estimates are reported for the total spending of the four projects, as well as for each of the four individually.

In order to evaluate the efficacy of the state’s tax incentive programs, our study uses economic impact analyses to calculate measures of return on investment associated with the rebates or credits to which the productions were eligible to receive.

In the following sections of the paper, we first describe the general methodology of economic impact analysis, then turn to describing the challenge of modeling a custom motion picture production sector.

Turning to an analysis of the data, we present a breakdown of the projects’ production costs, detailed expenditure patterns for their purchases of goods and services, and calculations for estimating direct taxes paid—all in the context of calibrating and simulating the model.

Results of our model simulations are presented in the following section, beginning with estimates for the economic impact of the four projects together, then for each of projects separately. In order to decompose and compare the relative magnitudes of the impacts, we present detailed results of “impact by parts,” expressed in terms of impacts per \$1 million of spending, along with

¹ The Arkansas Film Commission provides a filmography of movies with scenes in Arkansas dating back to the eighth and final silent rendition of *Uncle Tom’s Cabin* in 1927. Source: IMDB.com.

² The picturesque North Little Rock Mill appears briefly in the opening scenes of the movie.

an alternative decomposition of impacts per \$1,000 of tax incentive payments. The latter normalization can be used to evaluate the return on investment of the tax incentive program.

The penultimate section of the paper evaluates the efficacy of the tax incentive program, describing its history, assessing the program relative to expressed legislative intent (and how our findings apply), and finally, we present some conjectures about the efficacy of recent amendments to the program. A final section of the paper summarizes our main conclusions.

General Methodology

Our analysis utilizes an IMPLAN model of the Arkansas economy. IMPLAN is an input-output framework that is designed to trace out both the direct and secondary effects of economic activity within a particular region. In this study, the region is taken to be the State of Arkansas. The output of the model breaks down the total impact into three components:

- **Direct Effects** measure the effects of the initial round of investment or spending from an economic event.
- **Indirect Effects** capture the expenditures of the suppliers: the individuals and firms that provide the goods and services to accommodate the demand from the direct expenditure.
- **Induced Effects** arise from the additional spending made possible by the increase in incomes that are generated by the Direct and Indirect Effects.

In order to accurately capture the full impact on the state's economy, it is important to identify which sources of spending flow through locally (known as "capture") versus those that are spent out-of-state (known as "leakage"). For the calculation of indirect and induced effects, the IMPLAN model applies data-based proportions for in-state and out-of-state spending for each industry. Our detailed data set makes it possible to identify two specific leakage components, as described in the following section.

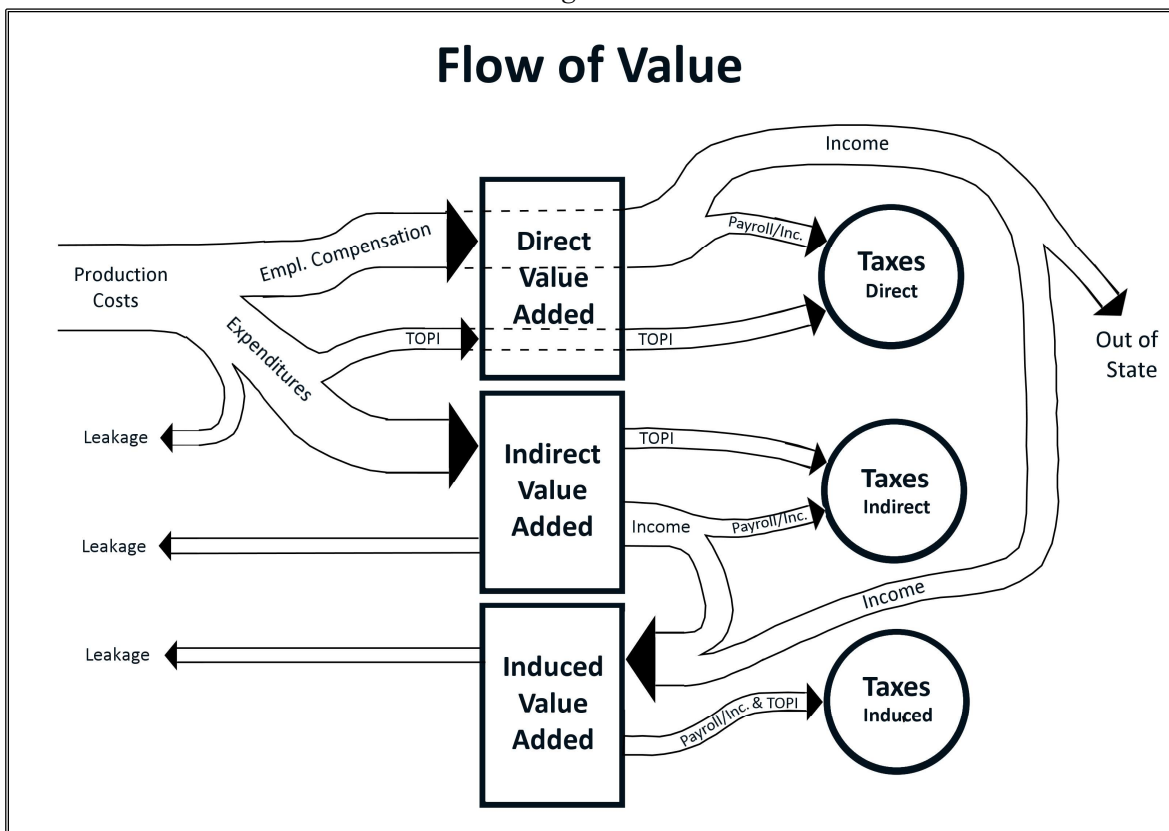
Modeling the Motion Picture Production Industry

A motion picture production company has some unique characteristics. As a business entity, it is of short-term duration and has no physical capital, only the human capital of the creative team that has come together to produce a film. The production company comes to Arkansas, paying taxable salaries, hiring in-state crew members, purchasing and renting goods, and paying for accommodations for cast and crew. Then they leave.

Figure 1 presents a flow diagram that illustrates the flow of value-added and taxes paid as the spending of the production company flows through the Arkansas economy. Total production costs go toward employee compensation and expenditures on goods and services. A common application of IMPLAN would be to enter totals for these two categories into the particular sector of interest, and let the model algorithms allocate the spending and taxes in a pattern typical of that sector.

The data provided by the Arkansas Film Commission consisted of detailed accounts from motion picture production companies for four films produced in Arkansas between 2021 and early 2023. Spreadsheets and accompanying documentation were submitted to the Film Commission as part of the application process for receiving the rebate incentives offered by the state. This level of detail allowed us to calculate expenditure patterns directly for each of the four projects, rather than allowing IMPLAN to allocate spending in a ‘typical’ pattern. We also calculated the share of expenditures going toward taxes directly from the data, pinning down direct value-added as the sum of employee compensation and taxes paid, with the remaining cost of goods and services equal to the value of intermediate inputs to production.

Figure 1:



Each of the four films was eligible for rebates of 20% of their production costs while filming in Arkansas and on post-production costs, plus a 10% additional rebate for wages and salaries paid to “below the line” employees who are full-time residents of Arkansas (for a total maximum credit of 30% of qualifying payroll costs). “Below the line” is a standard term in the movie industry to distinguish budget components associated directly with the project’s production, as opposed to the creative input from the “above the line” personnel, which include producers, directors, writers, and cast.

While the above/below the line distinction helped to guide our processing of the data, a more important distinction for the purposes of evaluating economic impact is to identify the in-state

versus out-of-state components of the payroll spending. In this regard, it was helpful to reference the Declaration of Residency forms that were submitted for each crew member who was eligible for the payroll rebate. Accordingly, we were able to separate the wages and salaries of in-state crew members and out-of-state crew members.

All above-the-line wages and salaries were added to those of the out-of-state crew members to generate a total out-of-state labor cost. However, per diem payments to cast and crew, intended to cover expenses while working in Arkansas, were included in the in-state totals. Payments to extras was also assumed to represent in-state income.³

During the four to six weeks of filming, the production company covers hotel accommodation, meals on the set, and even “craft service,” an on-site provider of drinks and snacks for the crew. All expenses associated with the production are reimbursed. Per diem payments are assumed to cover incidental expenses, so the wages and salaries for out-of-state workers are unlikely to have any meaningful impact on in-state spending or sales tax collections (i.e., induced effects).

We model this by combining two IMPLAN “events”: a “detailed industry impact event,” which includes the full payroll and a detailed expenditure profile, with a negative “employee compensation event” that subtracts the out-of-state payroll. The “employee compensation event” affects only the induced effects (and associated sales taxes). In Figure 1, this is represented by the partial flow of income out of the state, with the remainder going on to contribute to induced effects.

This is the first identifiable source of leakage. Payments to out-of-state employees contribute to measured employment and value-added, and represent income that is taxable by Arkansas; however, state personal income statistics are based on the state of residency, so the out-of-state labor costs are subtracted from the direct effects on income that are reported in our results.

The indirect effects depend on the value of expenditures as inputs to production. We specify this channel in detail, having sorted through every line of the expense spreadsheets (and sometimes between the lines), categorizing each expenditure into one of the 546 industry codes included in the IMPLAN model. In practice, only 53 industry codes were relevant for our purposes. For each expenditure, we focused on identifying the purpose of the expenditure, rather than the individual or business that was associated with the payment. For example, we sorted through receipts for reimbursements for items such as fuel, hotels, supplies, and even COVID-19 testing. In some cases, we disentangled single-payment reimbursements into multiple spending categories.

In order to capture direct taxation effects properly, we categorized retail spending by purpose. For example, if a purchase from a gasoline station was recorded as “craft service supplies” we categorized it as “Retail: Food and Beverage Stores,” but if the purchase was recorded as a fuel

³ Besides extras, there was one Arkansas resident who was a cast member on one of the projects. The wages she received for her small part in the production was included as in-state income.

expense, we categorized it as “Retail: Gasoline Stations.” Similarly, purchases from “General Merchandise Stores” or “Miscellaneous Store Retailers” were classified as food and beverage sales if that was the clear purpose of the spending. These distinctions are important for estimating direct taxes paid, since tax rates depend on the goods or services that are purchased, not the industry code of the retailer.

With this vector of sector-by-sector expenditures, we were able to run a set of detailed expenditure events in IMPLAN: Rather than simply inputting total spending and letting the model allocate the spending in the ‘typical’ patterns for an industry, we customized the model to specify the pattern of spending associated with each of motion picture projects.

The most obvious choice for an IMPLAN sector to use would be “429: Motion picture and video industries,” (Sector 429) which includes both the production and exhibition of movies. However, according to data from the Bureau of Labor Statistics, employment in the exhibition subsector (e.g. movie theaters) accounts for approximately 80% of the total employment for that sector in Arkansas. The motion picture exhibition business was subject to crippling conditions during the COVID-19 pandemic and had not fully recovered by 2021—the most recent year for IMPLAN calibration. Consequently, the parameters governing relationships among employment, output, and value-added components for the Sector 429 specification remain far out of line with their pre-pandemic values. And for that matter, it is not clear that Sector 429 is a good representation of motion picture production, separate from the distribution and exhibition subsectors.

In order to avoid these problems, we constructed a fully customized Motion Picture Production sector, calibrated directly from the data for the four projects.

Finally, there is one additional set of calibrations we used identify a source of leakage in the indirect channel. In some cases, the appropriate expenditure category could best be represented as spending back into the motion picture industry (e.g., to have a studio handle post-production work). Rather than use IMPLAN’s built-in capture and leakage proportions for that spending, we calibrated the relevant Regional Purchase Percentages (RPPs) to match the share of in-state versus out-of-state spending, depending on the location of the firm or individual receiving the contract. As a result, some of the indirect spending can be categorized as leakage, *ex ante*. Differences among the four projects in this regard were primarily associated with whether an in-state or out-of-state company was contracted for post-production or special-effects work.⁴

⁴ Given our ambivalence about the appropriateness of using Sector 429 parameters, we ran two sets of simulations for comparison. In the first, we channeled feedback to the Motion Picture Industry through Sector 429. In the second, the outsourced spending was directed to Sector 430: Sound Recording—the assumption being that Sound Recording was closer to film-production work than maintaining theaters and selling popcorn. A comparison of the results showed little overall difference, but did bring some outlier results in line. In our judgement, the Sound Recording results are a better representation of the spending we are trying to model, and those are the results we present in this paper.

Data Analysis and Model Calibration

Breakdown of Total Production Costs

Table 1 summarizes the breakdown of wage and salary expenses and total expenditures for the four projects. The first two projects were completed in 2021 and were on location in Fayetteville. The latter two were filmed in Little Rock in 2022 and early 2023. The earlier projects (A and B) had larger overall budgets, comprising about two-thirds of the total \$4.6 million for the four projects.

Table 1:

Production Costs And Rebates										
Location Year of Production	PROJECT A		PROJECT B		PROJECT C		PROJECT D		TOTALS	
	Fayetteville		Fayetteville		Little Rock		Little Rock			
	2021		2021		2022		2023		\$ (Thous.)	% of Total
	\$ (Thous.)	% of Total	\$ (Thous.)	% of Total	\$ (Thous.)	% of Total	\$ (Thous.)	% of Total	\$ (Thous.)	% of Total
Total Production Cost	1,626.8		1,475.4		522.1		971.4		4,595.7	
Wages and Salaries	733.9	45.1%	907.9	61.5%	351.3	67.3%	630.6	64.9%	2,623.6	57.1%
Out-of-State	600.4	36.9%	482.1	32.7%	134.2	25.7%	333.2	34.3%	1,549.9	33.7%
In-State	133.5	8.2%	425.8	28.9%	217.1	41.6%	297.4	30.6%	1,073.7	23.4%
Expenditures	892.9	54.9%	567.5	38.5%	170.8	32.7%	340.8	35.1%	1,972.1	42.9%
Average Crew Size	34.0		45.0		28.0		83.0		N/A	
Number of Days	31.0		41.0		31.0		42.0		145.0	
Employment (FTE)	3.9		6.1		3.4		10.7		24.1	
Production Rebate	325.4	20.0%	295.1	20.0%	104.4	20.0%	194.3	20.0%	919.1	20.0%
Payroll Rebate	12.0	0.7%	26.3	1.8%	16.4	3.1%	25.0	2.6%	79.7	1.7%
Total Rebate	337.3	20.7%	321.4	21.8%	120.9	23.1%	219.3	22.6%	998.9	21.7%

Table 1 also shows the direct employment impact. The average crew size per day and the number of pre-production and production days were taken from the production companies' rebate applications.⁵ The number of Full-Time Equivalent (FTE) employees is then calculated by multiplying the number of employees by the number of days and dividing by 360. To this figure we add one FTE employee, to account for the likelihood that some above-the-line employees of the production were receiving compensation for a longer span of time than just the pre-production and production stages. $[FTE = (Days * Employees) / 360 + 1]$. These are the values to be entered into the IMPLAN simulations, which encompass a full year of economic activity.

The final rows of Table 1 show the tax incentives for which the projects applied, representing 20% of total production and post-production costs, plus 10% of the wages and salaries of in-state

⁵ The number of days was calculated in calendar days (not working days) from the start of pre-production to the end of on-site production.

below-the-line employees. The latter amounts to a small share of the total incentive, comprising between 0.7% and 3.1% of total production costs.

Expenditure Patterns

A general categorical breakdown of expenditures on goods and services for the four projects is presented in Table 2. The upper portion of the table breaks out the spending that goes back into the Motion Picture Industry, along with the in-state percentage that defines the capture and leakage components of that spending.

The lower portion of the table presents some of the other major spending categories. (Some individual sectors were combined to reveal the overall distribution of expenditures.) The patterns vary somewhat among the individual projects, but the distribution of spending among sectors shows a concentration of spending on transportation, hotels, rentals, and restaurants that is similar to that of a tourist spending profile.

Table 2:

Expenditure Patterns										
	PROJECT A		PROJECT B		PROJECT C		PROJECT D		TOTALS	
	\$ (Thous.)	Percent	\$ (Thous.)	Percent	\$ (Thous.)	Percent	\$ (Thous.)	Percent	\$ (Thous.)	Percent
Total Expenditures	892.9		567.5		170.8		340.8		1,972.1	
Feedback to Motion Picture Industry	668.7	74.9%	205.8	36.3%	20.3	11.9%	71.1	20.9%	965.9	49.0%
<i>In-State Percentage</i>	<i>98.0%</i>		<i>0.0%</i>		<i>21.4%</i>		<i>73.7%</i>		<i>73.7%</i>	
Capture	655.3	73.4%	0.0	0.0%	4.3	2.5%	52.4	15.4%	711.8	36.1%
Leakage	13.4	1.5%	205.8	36.3%	16.0	9.3%	18.7	5.5%	254.0	12.9%
Net Other Expenditures	224.3	25.1%	361.7	63.7%	150.5	88.1%	269.8	79.1%	1,006.2	51.0%
Other Expenditure Categories*										
Retail	25.9	11.5%	54.3	15.0%	16.2	10.8%	41.2	15.3%	137.6	13.7%
Air Transportation	12.8	5.7%	9.9	2.7%	8.0	5.3%	15.9	5.9%	46.7	4.6%
Real Estate & Other Housing	41.1	18.3%	22.3	6.2%	14.0	9.3%	8.2	3.0%	85.6	8.5%
Legal, Acct'g, Finance, & Insur.	27.4	12.2%	33.9	9.4%	19.4	12.9%	25.5	9.5%	106.2	10.6%
Hotels & Accomodations	30.4	13.5%	69.1	19.1%	13.8	9.2%	62.1	23.0%	175.3	17.4%
Restaurants & Food Service	11.7	5.2%	31.5	8.7%	16.2	10.8%	30.4	11.3%	89.9	8.9%
Rental of Autos, Equip., Mach., etc.	53.0	23.6%	105.0	29.0%	46.7	31.1%	78.0	28.9%	282.7	28.1%
Other Expenditures	22.0	9.8%	35.7	9.9%	16.0	10.7%	8.5	3.1%	82.2	8.2%

*Shares for Other Expenditure reported as a percentage of total expenditures less feedback to the Motion Picture Industry.

Estimating Direct Taxes Paid

Building a customized sector to represent movie production in Arkansas required some additional calculations. For total output and employment, we used the sums of the four projects, as presented in Table 1. Calibration of value-added for the sector requires an estimate of a key component, Taxes on Production and Imports (TOPI). This category of taxes does not include taxes on employee compensation or earnings, but only includes the taxes directly paid during the production—including Federal, State and Local excise taxes and sales taxes, as well as other taxes and fees. We estimate this key parameter directly from the data provided.



Rather than search through every single invoice and receipt to calculate taxes paid (which would be impractical and infeasible), we applied statutory and estimated tax rates to the relevant expenditure categories. The results of these calculations, summed over the four projects, are summarized in Table 3.

Table 3:

Taxes on Production and Imports (TOPI)			
Sector	Federal	State	County & Local
Retail (Excl. Gas and Food)		\$6,529.94	\$3,011.67
Retail - Food and Beverage Stores		\$211.81	\$476.80
Retail - Gasoline Stations	\$813.67	\$1,017.09	
Air transportation	\$5,186.71		
Automotive Equip. Rental and Leasing		\$9,311.68	\$9,378.99
Rental of Other Goods, Equip. and Machinery		\$14,094.08	\$5,585.00
Hotels and motels		\$11,969.88	\$8,250.99
Full-Service Restaurants		\$1,353.69	\$899.55
Limited-Service Restaurants		\$2,014.32	\$1,580.88
All other food and drinking places		\$1,736.21	\$1,271.41
Other		\$4,302.48	
Totals	\$6,000.38	\$52,541.19	\$30,455.30
Grand Total			\$88,996.87

The methods for calculating the taxes in each line of Table 3 are as follows:

- **Sales taxes** were the largest component of TOPI. The state sales tax is 6.5%, and the county and city sales taxes were calibrated to equal “effective tax rates” for Washington County in 2021 for Projects A and B (3.4%), and for Pulaski County in 2022 for Projects C and D (2.4%).⁶ These rates were applied to all expenditure categories for which sales taxes are collected, including all retail spending except for gasoline and groceries.
- **Sales taxes at food and beverage stores** are subject to a reduced state sales tax rate (0.125%) if they are grocery purchases, but the full tax is charged for non-grocery items and prepared foods. County and city taxes are the same as for other retail goods, regardless of the spending category, and the prepared foods are also subject to a 2% local tax in both Fayetteville and Little Rock.⁷ We assume that 80% of purchases of food and beverages are for grocery items, with 20% subject to the higher tax rates, including the local taxes on prepared food.

⁶ The Effective Tax Rate is equal to the county tax rate plus a sales-weighted average of the city tax rates within the county. Calculation by the authors using data from the Arkansas Department of Finance and Administration.

⁷ In Fayetteville, the tax is known as the Hotel/Motel/Restaurant tax. In Little Rock, it is an Advertising and Promotions (A&P) tax.



- **Gasoline taxes:** There is no sales tax charged for gasoline sales, but per-gallon taxes are assessed at the federal and state levels. We take total spending on fuel at gasoline stations divided by the average price/gallon in Arkansas to yield an estimate of the number of gallons purchased.⁸ Each gallon is subject to a federal tax of \$0.183/gal for gasoline and \$0.243/gal for diesel fuel.⁹ We use an estimate of \$0.20/gal to estimate the total federal taxes paid. The state tax on gasoline is \$0.246 for gasoline and \$0.284 for diesel.¹⁰ We use an estimate of \$0.25 for calculating state taxes.
- **Air transportation** is subject to a federal tax of 7.5%. In addition, there is a Flight Segment Tax of \$4.80/segment, a Federal Security Charge of \$5.60/flight, and a Passenger Facility Charge of \$4.50/airport.¹¹ The Flight Segment Tax increased from \$4.00 to \$4.80 during the time from 2021 through 2023, and the percentage effect of the per flight/segment/airport taxes on the total cost depends on the underlying ticket price. Using a sample of air fare receipts from the four projects, we calculated an effective tax rate of approximately 12.5%. Although some of the charges go to local airport authorities, we designate this tax as being fully federal.¹²
- **Automobile rentals** are the highest-taxed expenditures in the expense reports. In addition to state and local sales taxes, the state imposes a 10% extra tax on rental vehicles.¹³ Customer facility charges, energy recovery fees, and vehicle license fees add other charges that are assessed per day. Finally, there are concession recovery fees of up to 11.11% on rental cars from airport facilities. As with the taxes on air transportation, the total tax burden depends on the underlying price, the number of days, and whether or not a concession recovery fee was charged. For Projects C and D in Little Rock, the total tax averaged 38.7%. Project B avoided the concession recovery by renting at a non-airport site. Based on our review of rental car receipts, we assume total tax rates of 32% for Project A, 26% for Project B, and 39% for the Little Rock projects, C and D.
- **Rentals of other equipment** are subject to full sales taxation plus a 1% Short-Term Rental Tax imposed by the state.¹⁴

⁸ Gasoline prices for the four projects were averages for the months of production: April-May 2021, \$2.719/gallon; November-December 2021, \$2.949/gallon; April 2022, \$3.740/gallon; and January through March 2023, \$3.065/gallon. Source: Oil Price Information Service.

⁹ Source: U.S. Energy Information Administration.

¹⁰ Source: Arkansas Department of Finance and Administration.

¹¹ See Airlines for America, U.S. Government-Imposed Taxes on Air Transportation, Jan 1, 2023; and Ulrik Boesen, "Understanding the Price of Your Plane Ticket," Tax Foundation, October 28, 2019.

¹² For the purpose of calibrating the model, the taxing authority doesn't matter, only the amount of the tax.

¹³ Source: Arkansas Department of Finance and Administration, "Sales Tax Rates," <https://www.dfa.arkansas.gov/excise-tax/sales-and-use-tax/state-tax-rates/>, accessed 9/1/2023.

¹⁴ Source: Arkansas Department of Finance and Administration, "Sales Tax Rates," <https://www.dfa.arkansas.gov/excise-tax/sales-and-use-tax/state-tax-rates/>, accessed 9/1/2023.

- **Hotels and motels** are also subject to multiple taxes. In addition to sales tax, the state imposes a tourism tax (occupancy tax) of 2%. Local taxes are relevant too: Fayetteville charges a 2% Hotel/Motel/Restaurant tax while Little Rock imposes a 4% hotel tax (A&P).
- **Full-Service Restaurants** present another unique set of issues. Before calculating taxes, we scaled down the total expenditure to account for a 20% tip. Full state and local sales taxes apply, including the 2% local taxes in Fayetteville and Little Rock. Industry benchmarks indicate that alcohol sales comprise around 20-25 percent of revenues for full-service restaurants. Alcohol sales are subject to liquor tax, beer tax, wine tax, and mixed drink taxes. To estimate these taxes, we take 20% of the post-tip total and assume an additional 3% tax applies.
- **Limited-Service Restaurants** are subject to all state and local sales taxes including the local taxes on prepared food. However, we assume no tip or tax on alcohol.
- **Other food and drinking places**, primarily catering services, were considered to be taxed the same as limited-service restaurants.
- **Other taxes and fees** comprise payments of taxes and fees that were included in the project spreadsheets.

The total of all taxes comes to nearly \$90,000. This represents 4.5% of total non-labor expenditures.

This estimate of direct taxes paid plus total employee compensation constitutes the total value-added for the custom industry. The remaining expenditure represents the underlying value of inputs. For simulations of each of the four projects individually we use the same methodology to calibrate direct taxes and value-added. (Table 3 reports the sums of taxes calculated for each of the four projects.)

One additional complication has little effect on results, but is incorporated to provide a complete accounting: It is common for a crew member’s contract to include payments for a kit fee (also referred to as a kit rental fee, a box fee, or a box rental fee). The kit fee “is a payment that a production company pays a crew member for the approved and authorized use of their own ‘kit,’ which may include reusable equipment, and may include expendables.”¹⁵ These payments are included on paychecks as non-taxable income, although the tax considerations are more complex.

We did a complete analysis of the payroll for Project B, and found that kit fees for in-state crew members accounted for about 9.6% of total in-state employee compensation. We use this estimate to separate out a share of the in-state compensation that we categorize as Proprietors’ Income, and designate 6.25% of total employment as Proprietor Employment. In the IMPLAN

¹⁵ Loring Wesenberger, “The Essential Guide to Kit Fees,” <https://www.wrapbook.com/blog/essential-guide-kit-fees>, accessed September 1, 2023.

model, sole proprietors are assumed to reside in the study area and pay pass-through taxes. As far as reporting goes, however, IMPLAN combines employees and proprietors and their incomes.

Model Simulations

As a first simulation experiment, we ran the model using the totals for the four projects together. This served as a check on our specifications and as a benchmark for gauging the different features of the four projects when estimated separately.

Results for the Sum of the Four Projects:

The results of this simulation are reported in Table 4. The first line of Table 4 reports the direct effects of the movie projects on employment, income, and value-added (which measures the contribution to state GDP). Because we customized the Motion Picture Production sector directly from the data, these effects are just as we entered them: Total employment (FTE) of 24.15, income of \$1.07 million, and value-added of \$2.71 million. The full payroll of \$2.62 million is included in the simulations (so as to properly estimate the income tax effects), but the out-of-state component is suppressed in the reported results to reflect the fact that only in-state wages and salaries are included in state-level personal income.

Table 4:

Impacts for the Sum of All Projects (Dollar values in thousands)			
Impact	Employment	Income	Value Added
Direct	24.15	\$1,073.7	\$2,712.6
Indirect	8.08	\$349.5	\$803.9
Induced	6.06	\$287.3	\$546.8
Total	38.29	\$1,710.5	\$4,063.3

The second line of Table 4 shows the indirect effects linked to expenditures on all inputs other than labor. From the total spending of \$1.97 million, these expenditures are associated with an additional \$350 thousand in income and \$804 thousand in value added, supporting 8.08 FTE jobs.

Finally, the income from the direct and indirect effects generate the induced impacts, as individuals in the economy spend on local goods and services. The results in Table 4 show that induced impacts add 6.06 FTE jobs, generate \$287 thousand in income, and value-added of \$547 thousand.

Noting that the total tax incentive claimed by the four films was almost exactly \$1 million, these results can, by extrapolation, be considered a broad estimate of the returns to the state's investment, per \$1 million allocated.

Before turning to the analysis of the four projects separately, we consider the tax impacts for the sum of the projects. Table 5 breaks these down by level of impact (Direct, Indirect, and Induced)

for tax collections by the state government and by county and local taxing authorities. (Federal tax impacts are not reported here, since those would be the same regardless of whether the movie was filmed in Arkansas.)

The state taxes reported in Table 5 include about \$73.7 thousand in income taxes and \$207.4 thousand in other taxes.¹⁷ State income taxes are estimated directly from the impacts on income in Table 4 (including out-of-state wages and salaries), using a factor for aggregate income tax collected relative to personal income in 2021.¹⁸ The other state taxes represent the IMPLAN totals minus the income tax estimate. County and local taxes (as reported in IMPLAN) add another \$77.6 thousand, for a total of nearly \$359 thousand of in-state tax collections.

Table 5:

Tax Impacts for the Sum of All Projects (Dollar values in thousands)					
Impact	State Income Tax	Other State Tax	County & Local	Total In-State	As Percent of Prod. Cost
Direct	\$59.3	\$81.9	\$31.8	\$173.0	3.76%
Indirect	\$7.9	\$80.5	\$29.4	\$117.8	2.56%
Induced	\$6.5	\$45.0	\$16.4	\$67.9	1.48%
Total	\$73.7	\$207.4	\$77.6	\$358.7	7.80%

The final column of Table 5 reports the total in-state tax collections as a percent of the industry’s total output (total production cost from Table 1) of \$4.6 million. Total tax collections of \$359 thousand represent 7.8% of production cost. From Table 1, the total of rebate payments from the state was \$1.0 million or 21.7% of production cost. So, for the four projects combined, state and local tax collections recovered about one-third (35.9%) of the amount of the rebate payments.

Results for the Individual Projects

To disaggregate and analyze the results found for the sums of the four projects, we ran simulations of each project separately, using the unique pattern of expenditures, payrolls (in-state vs. out of state), and direct taxes paid for each project.

Table 6 report the impact estimates for each of the four projects. The Direct Effects come directly from the data, the Indirect Effects are derived from non-payroll spending, and the

¹⁷ The detailed breakdown of taxes by type reported in the IMPLAN simulations is imprecise, using a tax distribution formula that is not specific to a particular sector, but calculated using an average breakdown for all industries. Consequently, we do not report those details here.

¹⁸ Specifically, Arkansas income tax collections in 2021 were \$3.467 billion (U.S. Census Bureau, 2021 State and Local Government Finance), and personal income for the state in 2021 was \$153.185 billion (U.S. Bureau of Economic Analysis, Annual State Personal Income), yielding a factor of \$0.0226 for income taxes per dollar of personal income. The results reported are roughly equivalent to the totals for all individual taxes reported in the detailed IMPLAN tax tables.

Induced effects are generated by spending associated with incomes generated by the Direct and Indirect Effects.

Table 6:

Impacts for the Four Projects (Dollar values in thousands)			
Project A			
Impact	Employment	Income	Value Added
Direct	3.93	\$133.5	\$750.1
Indirect	3.61	\$151.4	\$425.6
Induced	1.22	\$57.6	\$109.6
Total	8.76	\$342.4	\$1,285.3
Project B			
Impact	Employment	Income	Value Added
Direct	6.12	\$425.8	\$940.5
Indirect	2.03	\$90.2	\$172.6
Induced	2.21	\$104.3	\$198.5
Total	10.35	\$620.3	\$1,311.5
Project C			
Impact	Employment	Income	Value Added
Direct	3.41	\$217.1	\$364.6
Indirect	0.85	\$40.9	\$72.6
Induced	1.10	\$52.1	\$99.1
Total	5.36	\$310.1	\$536.3
Project D			
Impact	Employment	Income	Value Added
Direct	10.69	\$297.4	\$657.5
Indirect	1.60	\$66.2	\$135.2
Induced	1.55	\$73.4	\$139.6
Total	13.83	\$436.9	\$932.3

The results for the four projects are roughly proportional to their total budgets, particularly with respect to value-added. Because out-of-state wage and salary payments are included in value-added but not in income, the gap between the total impacts on those two components depends on the magnitude of out-of-state wage and salary payments. From Table 1, Project C had the smallest proportion of leakage from out-of-state wage and salary payments (25.7%), and shows the smallest gap between the impacts of value-added and income. Project A had the highest out-of-state labor component (36.9%), thereby subtracting a larger share of the total output from realized in-state income.

The relationships between the Direct effects and Indirect effects also differ among the various projects. Project A shows a substantially larger role for Indirect effects than the other projects, relating to the much larger share of non-labor expenditures in Project A's total production cost (54.9%). Moreover, a very large share of those expenditures (75%) went toward post-production costs that were outsourced to an in-state firm. Hence, the indirect effects for Project A are capturing some of the impacts that are reflected in the direct effects for the other projects.

As these comparisons suggest, differences in the impacts generated by the four projects depend on the relative sizes of their overall budgets and by the magnitudes of leakage represented by out-of-state wages and salaries (especially for income). Moreover, the share of non-labor expenditures matters for the relative magnitude of indirect effects. As we show below, the other key differences among the four projects' impact results are related to the leakage from the indirect-effect channel.

The implications for state and local taxes follow similar patterns as the economic indicators. As shown in Table 7, total tax collections for each of the four projects are roughly proportional to the total production costs of the four projects.

Table 7:

Tax Impacts for the Four Projects (Dollar values in thousands.)					
Project A					
Impact	State Income Tax	Other State Tax	County & Local	Total In-State	As Percent of Prod. Cost
Direct	\$16.6	\$14.9	\$5.9	\$37.4	2.30%
Indirect	\$3.4	\$43.7	\$15.8	\$62.9	3.87%
Induced	\$1.3	\$9.0	\$3.3	\$13.6	0.84%
Total	\$21.3	\$67.6	\$25.0	\$113.9	7.00%
Project B					
Impact	State Income Tax	Other State Tax	County & Local	Total In-State	As Percent of Prod. Cost
Direct	\$20.5	\$29.8	\$11.6	\$62.0	4.20%
Indirect	\$2.0	\$17.1	\$6.3	\$25.5	1.73%
Induced	\$2.4	\$16.3	\$5.9	\$24.6	1.67%
Total	\$24.9	\$63.3	\$23.9	\$112.0	7.59%
Project C					
Impact	State Income Tax	Other State Tax	County & Local	Total In-State	As Percent of Prod. Cost
Direct	\$7.9	\$12.2	\$4.7	\$24.9	4.77%
Indirect	\$1.0	\$6.8	\$2.5	\$10.2	1.78%
Induced	\$1.2	\$8.2	\$3.0	\$12.4	2.36%
Total	\$10.1	\$27.2	\$10.2	\$47.5	9.09%
Project D					
Impact	State Income Tax	Other State Tax	County & Local	Total In-State	As Percent of Prod. Cost
Direct	\$14.3	\$24.7	\$9.6	\$48.5	4.99%
Indirect	\$1.5	\$13.8	\$5.1	\$20.4	2.10%
Induced	\$1.7	\$11.5	\$4.2	\$17.3	1.78%
Total	\$17.4	\$50.0	\$18.8	\$86.2	8.88%

As reported in Table 5 for the sum of all projects, the indirect and induced effects in Table 7 have relatively little impact on state income tax collections, but account for approximately half of the other state taxes, as well as for county and local taxes. The exception to this pattern is Project A, for which outsourcing pushed direct impacts into the indirect category.

The final column reports total in-state tax collections as a percent of total production cost. Recall that in Table 5, we found that the sum of all projects had total tax collections that represented about 7.8% of total production cost. Table 7 reveals notable differences among the projects in that regard. The lowest taxes-per-output measure is 7.0% for Project A. Project B was roughly in line with the average, while Projects C and D show percentages of 9.1% and 8.9%, respectively.

For the sum of the projects, Table 5 reports that total tax collections represented amounted to 35.9% of the total rebate. Calculations for the four projects separately show figures of 33.8% for Project A, 34.9% for Project B, 38.5% for Project C, and 39.3% for Project D. Although the latter two had higher rebate rates, the tax collections generated by their activity cover a larger share of the cost of the tax incentive.

A Detailed Breakdown of the Results

In order to clarify the sources of economic impact and the differences among the four projects, we need to normalize the results by expressing them in terms of a common denominator. In addition, we ran a set of simulations to generate “impact by parts” to break down the sources of each channel of economic impact. Table 8 reports a detailed breakdown of the sum of the four projects, expressed per \$1 million of total production cost.

Table 8:

Economic Impacts per \$1M Spending - Sum of All Projects			
(Dollar values in thousands)			
Impact	Employment	Income	Value Added
Direct - Out-of-State	0.000	\$0.0	\$337.2
Direct - In-State	5.255	\$233.6	\$253.0
Induced (Direct)	0.994	\$47.1	\$89.7
Indirect (Feedback)	0.577	\$22.6	\$77.4
Induced (Feedback)	0.096	\$4.6	\$8.7
Indirect (Other)	1.181	\$53.4	\$97.6
Induced (Other)	0.228	\$10.8	\$20.6
Total	8.331	\$372.2	\$884.2

The first two lines of Table 8 divide the Direct effects into out-of-state and in-state components. The former adds nothing to in-state income, but impacts value-added one-for-one. The in-state direct effects include all of the in-state income and value-added includes the direct taxes paid as costs of production. Note that nearly two thirds of the total impacts derive from the direct effects. The third line shows the induced impacts associated with the direct effects only. These three lines summarize the total impact of spending on wages and salaries, and represent about 75% of the total impacts.



The next two lines isolate the impacts derived from spending back into the motion picture production industry—feedback effects. For this category, only the spending that goes to in-state companies matters. By setting the model’s Regional Purchase Percentage (RPP) to match the in-state shares derived from our data analysis, we effectively calibrate the leakage from this channel directly. As reported in Table 2, \$966 thousand in this category of spending includes \$254 thousand in leakage, with the remaining \$712 thousand contributing to the Indirect (Feedback) impacts in Table 8. Including the associated induced effects, this channel of spending adds \$27.2 thousand to income, adds \$86.1 thousand to value-added, and supports an additional employment of 0.67 FTE employees.

The last two lines report the impact from all other expenditures, which includes spending on transportation, hotels, rentals, and restaurants—the tourist-type spending profile. This channel of expenditures amounted to \$1.0 million (Table 2). The indirect and induced effects of this spending generate \$64.2 thousand in income and \$118.1 thousand in value-added, supporting 1.4 FTE employees.

Table 9 reports detailed breakdowns of the economic impacts of the four projects separately. This representation reveals some stark differences among the four projects and illustrates the sources of the differences.

Project A is a notable outlier, showing the smallest impact per \$1 million of total production cost. One obvious reason is the fact that nearly 37% of the total budget goes toward out-of-state wages and salaries. In addition, Project A had the largest share of its budget devoted to post-production costs (feedback into the motion picture production sector) and the smallest share devoted to other expenditures (the tourist-type spending). As it turns out, the latter category of spending has larger impacts per dollar spent.

Project B is notable for the lack of any impact from the feedback channel, since 100% of the spending on that category represented direct leakage. Nevertheless, the direct effect from in-state wages and salaries and the indirect effects from the tourist-type spending are higher than Project A and comparable to the other two projects.

As the project with the largest share of spending on wages and salaries, particularly in-state, Project C has the largest direct-effect impacts. Project C also had the smallest proportion of spending through the feedback channel and the highest proportion of spending on tourist-type expenditures, giving it the largest indirect effects (along with the associated induced impacts).

Project D is very similar to Project B, but with slightly larger direct effects, a positive contribution from the feedback channel, and nearly identical contributions from other indirect effects.

Table 9:
Economic Impacts per \$1M Spending
 (Dollar values in thousands)

Project A				Project B			
Impact	Employment	Income	Value Added	Impact	Employment	Income	Value Added
Direct - Out-of-State	0.000	\$0.0	\$369.1	Direct - Out-of-State	0.000	\$0.0	\$326.8
Direct - In-State	2.416	\$82.0	\$92.0	Direct - In-State	4.148	\$288.6	\$310.7
Induced (Direct)	0.350	\$16.6	\$31.6	Induced (Direct)	1.234	\$58.3	\$111.0
Indirect (Feedback)	1.506	\$58.9	\$201.3	Indirect (Feedback)	0.000	\$0.0	\$0.0
Induced (Feedback)	0.252	\$11.9	\$22.7	Induced (Feedback)	0.000	\$0.0	\$0.0
Indirect (Other)	0.713	\$34.1	\$60.3	Indirect (Other)	1.376	\$61.2	\$117.0
Induced (Other)	0.148	\$6.9	\$13.2	Induced (Other)	0.264	\$12.4	\$23.5
Total	5.386	\$210.5	\$790.1	Total	7.016	\$420.4	\$888.9

Project C				Project D			
Impact	Employment	Income	Value Added	Impact	Employment	Income	Value Added
Direct - Out-of-State	0.000	\$0.0	\$257.1	Direct - Out-of-State	0.000	\$0.0	\$343.0
Direct - In-State	6.531	\$415.9	\$441.3	Direct - In-State	11.005	\$306.1	\$333.8
Induced (Direct)	1.781	\$83.9	\$159.7	Induced (Direct)	1.307	\$61.8	\$117.5
Indirect (Feedback)	0.038	\$1.2	\$4.2	Indirect (Feedback)	0.206	\$7.9	\$26.9
Induced (Feedback)	0.002	\$0.2	\$0.5	Induced (Feedback)	0.031	\$1.6	\$3.0
Indirect (Other)	1.590	\$77.0	\$134.8	Indirect (Other)	1.441	\$60.2	\$112.2
Induced (Other)	0.323	\$15.6	\$29.7	Induced (Other)	0.257	\$12.2	\$23.2
Total	10.267	\$593.9	\$1,027.1	Total	14.240	\$449.7	\$959.7

From this discussion, it should be clear that the differences in total economic impact are closely associated with differences in the breakdown of total production costs:

Wages and salaries paid to in-state workers result in one-for-one direct effects on income and value-added, but out-of-state wage and salary payments contribute only to value-added. Induced effects associated with the direct impacts contribute an additional 20.2% to income and 35% to value-added.

Expenditures that flow back into the motion picture production industry (feedback) turn out to contribute to relatively small impacts: For each \$1 million spent through this channel (excluding leakage), the indirect impacts include \$146 thousand in income, \$500 thousand in value added, and approximately 4 FTE jobs. In addition, the induced effects generated through this channel add an additional 20.2% of the indirect effect on income (\$29.5 thousand), 11.2% of the indirect effect on value-added (56.2 thousand), and a 16.7% increase in the number of jobs supported by the indirect (feedback) channel. Including both indirect and induced effects, the impacts total approximately \$176 thousand for income, \$556 thousand for value-added, and employment of 4.3 (FTE).

Other expenditures have somewhat less systematic impacts, since there is variety in the composition of that spending. For each \$1 million spent on this tourist-type expenditure pattern, indirect impacts on income range from \$241 thousand (Project D) to \$293 thousand (Project C). Indirect impacts on value-added range from \$449 thousand to \$524 thousand, while employment impacts are approximately 6.0 FTE jobs. Induced effects associated with this spending increase income by an additional 20.2% (and increase value-added by 20% to 22%). The induced effect on employment adds another 18% to 20% to employment generated by this channel of spending. Overall, spending of \$1M on these other expenditures has impacts on income ranging from \$290 thousand to \$352 thousand, impacts on value added ranging from \$542 thousand to \$630 thousand, supporting FTE employment of 6.8 to 7.3.

Using these patterns, it is possible to estimate the model's output formulaically—with a fair degree of accuracy—using information on direct hiring and spending on wages and salaries (in-state and out-of-state), taxes paid (TOPI), the captured spending through the feedback channel, and the amount of other expenditures.

Return on Investment

To summarize the differences among the four projects, we identify a specific metric to evaluate the return on state's investment in the projects. The metric we use includes total income received by Arkansas's, *plus* the estimated income taxes collected from out-of-state employees, expressed per \$1,000 dollar of tax incentive payments. Although the taxes on out-of-state residents' incomes do not affect incomes of Arkansas residents directly, they represent one component of that expenditure stream that is retained in-state.

Table 10 presents this measure for the four projects and the sum of the four, with a detailed breakdown of the impact channels.¹⁹

Table 10:

Return on Investment: Impacts on Income Plus Tax Adjustment per \$1,000 Tax Incentive (Dollar values in thousands)					
Impact	Project A	Project B	Project C	Project D	Sum
Direct - Out-of-State	\$0.040	\$0.034	\$0.025	\$0.034	\$0.035
Direct - In-State	\$0.396	\$1.325	\$1.797	\$1.356	\$1.075
Induced (Direct)	\$0.080	\$0.268	\$0.362	\$0.274	\$0.217
Indirect (Feedback)	\$0.284	\$0.000	\$0.005	\$0.035	\$0.104
Induced (Feedback)	\$0.057	\$0.000	\$0.001	\$0.007	\$0.021
Indirect (Other)	\$0.165	\$0.281	\$0.333	\$0.267	\$0.246
Induced (Other)	\$0.033	\$0.057	\$0.067	\$0.054	\$0.050
Total	\$1.055	\$1.964	\$2.591	\$2.027	\$1.748

For each of the projects except Project A, the direct effect of wages and salaries paid to in-state employees covers more than the amount of the rebate. For Project A, the relatively small proportion of payroll going to in-state employees generates less than \$400 per \$1,000 in rebate payments. With the inclusion of substantial indirect effects, particularly through the feedback channel, Project A returns a total of \$1,055 per \$1,000 of tax incentive. This low rate of return suggests that the tax incentive rebate, in this case, had an impact comparable to a program that made direct payments to the in-state workers. Such a hypothetical program would include a direct impact of \$1,000 plus an additional \$202 in induced effects on total income.

The other three projects delivered far higher returns to the tax incentive program. Project C, with the largest share of in-state wages and salaries had the highest return: nearly \$2,600 for each \$1,000 in rebate payments.

For the sum of the four projects, the breakdown in Table 10 shows that the Direct Effect of in-state payrolls is just large enough to offset the size of the rebate payment. Indirect and Induced effects add to the total, which indicates that \$1,000 in tax incentive payments generates approximately \$1,750 in Arkansas income. It is clear that Project A brings down the averages. Consequently, we consider the sum of the four projects to represent a very conservative estimate of returns. The results for Projects B, C, and D provide a range of returns that might be considered ‘typical.’

¹⁹ Note that with the results in Table 10 denominated in thousands per thousand dollars of rebate payments, the entries in the table can also be interpreted as dollars per single dollar spent.

Evaluating the Tax Incentives

Background and History

The history of Arkansas tax incentives for the motion picture production industry dates back at least to the Motion Picture Incentive Act (MPIA) of 1997.²¹ This program offered a 100% rebate of all sales and use taxes paid in connection with a film production project in Arkansas. Subsequent legislation extended tax credits to cover 10% of the in-state employment costs associated with motion picture production.²²

When the MPIA expired in 2009, it was replaced by The Digital Product and Motion Picture Industry Development Act (DPMPIDA) of 2009.²³ The DPMPIDA included many of the application and reporting procedures as the MPIA, and it refined the previously existing payroll incentive to specifically target below-the-line employees who are Arkansas residents.

Originally set at 15%, the rebate for in-state production and post-production costs was raised to 20% in 2013.²⁴ Several modifications were introduced in 2021.²⁵ First, DPMPIDA was amended to allow for a tax credit instead of a rebate (with the language of “tax incentive” substituted throughout to encompass both options). Second, a 10% incentive for employing veterans (or hiring veteran-owned Arkansas-based small businesses) was added to the incentive for below-the-line in-state employees. To make the veteran-based and in-state based employment incentive an either/or proposition, the 2021 legislation also placed a cap of 30% on the total tax incentives claimed for any particular expenditure, so the production company could claim an additional 10% for below-the-line Arkansas residents *or* veterans, plus a new possible rebate for non-wage expenses paid to veteran-owned businesses in the state.

Although Projects B, C, and D could have claimed some of these new opportunities for rebates or credits, none did so. Consequently, our analysis has covered the incentives that DPMPIDA offered from 2013 through mid-2021. We will discuss some of the newer changes (including those adopted in 2023) in a subsequent subsection.

Legislative Intent

To evaluate the efficacy of the tax incentives, it is helpful to consult the Legislative Intent section of the DPMPIDA (A.C.A. §15-4-2002). The nine paragraphs offered to explain the objectives of the program are shown in Box 1.

Three of the nine paragraphs (3, 6, and 9) can be summarized as asserting that tax incentives in other states and the 1997 Arkansas MPIA have been successful in attracting motion picture projects that benefited their local economies.

²¹ [Act 919 \(1997\)](#).

²² [Act 1232 \(2005\)](#).

²³ [Act 816 \(2009\)](#).

²⁴ [Act 496 \(2013\)](#).

²⁵ [Act 797 \(2021\)](#).

In general, tax rebates or credits are intended to provide incentives. If an economic activity would take place without an incentive program in place, then there is little point in having it in the first place. Participants in the process, including the recipients of the tax incentives, the administrators of the program, and the legislators who voted for it, would undoubtedly attest to the importance of having the incentives in place to attract film projects that might otherwise go elsewhere, so the question becomes one of determining the proper size and structure of an incentive package that is sufficient, but not unnecessarily lavish.

One of the legislative intent paragraphs of the DPMPIDA can be directly addressed by the findings of this paper. Paragraph 5 states that legislators recognized that “temporary revenue loss to seed the initial growth will be offset by the film and digital content industry's total value added to the Arkansas economy and directly offset through the state and local taxes collected on economic activity generated by the industry.”

Among our findings, we show that total tax collections do not fully offset the cost of the tax incentive; that is, the program does not “pay for itself” by generating tax collections, but that total tax collections do cover about one-third (30%-39%) of the rebate cost. That is not inconsistent with the notion of “temporary revenue loss to seed the initial growth,” but the assertion that these losses will be “offset through the state and local taxes collected on economic activity generated by the industry” is only partly realized now, fourteen years after the act was passed.

Table 10 addresses the broader evaluation of economic impact from our simulations, addressing the question of whether the “industry’s total value added to the Arkansas economy” offsets the “temporary revenue loss.” Expressed as a return on each \$1,000 of tax incentives granted, the state’s economy experiences (on average) an increase in state personal income of about \$1,750.

Nevertheless, the appropriate comparison to make is with the opportunity cost of the tax incentive program: Are there other economic development incentives (for this or other sectors) that would provide better returns, were we to divert resources there? Answering that question is beyond the scope of this paper, but we hope that our quantitative evaluation can be used by policymakers and legislators to address it.

The fact that the four films examined in this study had at least 75% of their below-the-line employees being Arkansas residents, and that significant portions of the costs for sound, lighting, and post-production were subcontracted to Arkansas businesses, the objective of cultivating the industry has arguably been successful.

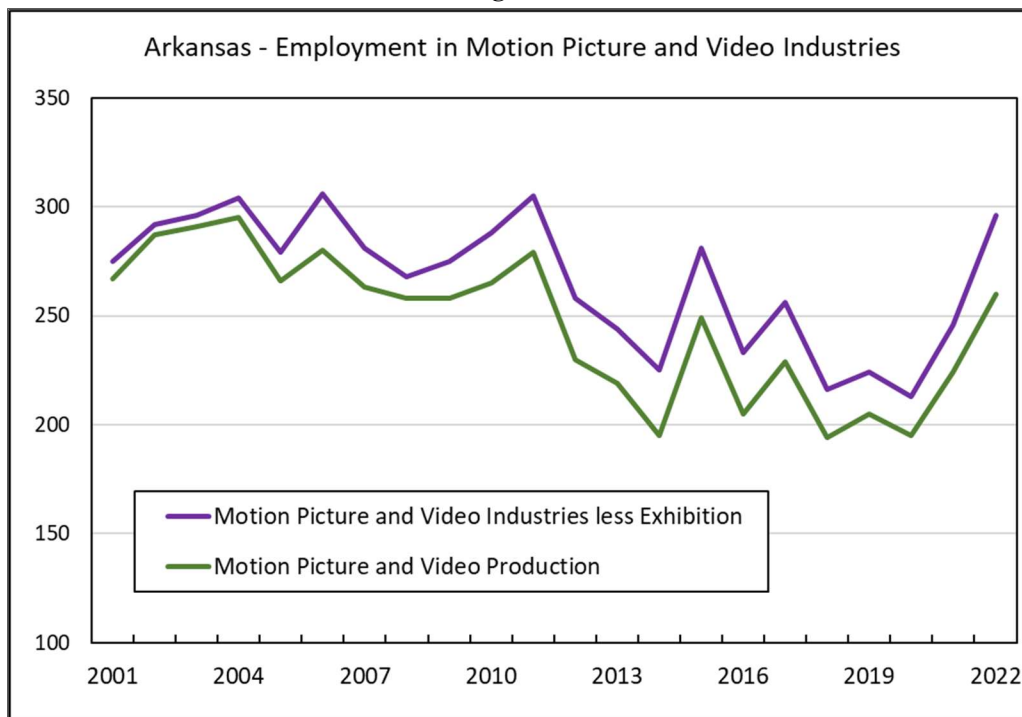
A.C.A. § 15-4-2002. Legislative intent.

It is the intent of the General Assembly to assist in cultivating the film industry by:

- (1)** Providing the citizens of Arkansas with the education, training, and financial tools to succeed in today's global economy. The economic landscape of the state and the nation has moved from a manufacturing-based economy to one based on knowledge and technology, and to cultivate the state's economy based upon knowledge and technology, by further developing the film and digital content industry in Arkansas;
- (2)** Providing the financial incentives needed to foster the long-term development of the digital medium and traditional film industry in Arkansas;
- (3)** Recognizing that similar incentives in surrounding states have been a catalyst for unprecedented economic growth within those states and that to create an effective mechanism for the sustained growth of the film industry in Arkansas will require the passage of legislation that establishes a film production incentive program that is not only competitive but also uniquely attractive to specific types of projects, production companies, and infrastructure creation;
- (4)** Recognizing that a successfully cultivated film industry will create a sector of high technology in Arkansas, a much-needed infusion of capital into areas of the state that may be economically depressed, and offer to Arkansans skilled labor employment opportunities that require knowledge and pay well;
- (5)** Recognizing that the temporary revenue loss to seed the initial growth will be offset by the film and digital content industry's total value added to the Arkansas economy and directly offset through the state and local taxes collected on economic activity generated by the industry;
- (6)** Allowing Arkansas to become competitive with surrounding states that offer financial incentives to the film and digital content industry;
- (7)** Creating a vibrant film and digital content industry in Arkansas that will be essential to retain highly educated and creative individuals in Arkansas who want to pursue a career in this field;
- (8)** Recognizing that the state is uniquely qualified to attract digital form product providers to live, work, and play within its borders due to the state's natural settings, availability of labor and materials, climate, and the hospitality of its people; and
- (9)** Recognizing that the Motion Picture Incentive Act of 1983, previously codified at this subchapter, which was one of the first incentives offered to the motion picture industry and allowed the state and motion picture industry to develop a strong partnership, resulted in a significant increase in the number of movies filmed in Arkansas.

On the other hand, employment in the motion picture and video industries has not increased since the passage of the DPMPIDA. As shown in Figure 2, employment in Motion Picture and Video Production generally trended downward from 2010 to 2020, rebounding in 2022 to total 260 employees. A broader measure, total industry employment less motion picture exhibition, had 296 employees in 2022.²⁶

Figure 2:



The best that could be said is that Arkansas has maintained a small, but active motion picture industry that has shown signs of recent expansion. To the extent that the DPMPIDA has worked to attract projects to Arkansas, it has helped to maintain the industry.

One of the features of tax incentives for the film industry is that it must be an ongoing endeavor. Unlike other firms (e.g. a manufacturing facility), a film production project is a short-term entity, accumulating no assets in the state and with no ongoing operations sustaining economic activity. In order to reap the benefits of bringing motion picture projects to the state, new projects must constantly be recruited.

One paragraph of the legislative intent (paragraph 8), speaks of “the state's natural settings, availability of labor and materials, climate, and the hospitality of its people” as an attraction for “product providers to live, work and play within ... [Arkansas] borders.” Ostensibly, the statement seems to suggest that incentives should not be needed to attract the industry to Arkansas. More generally, in the context of the other statements of legislative intent, it might be

²⁶ Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

interpreted as referring to the publicity value of promoting the state's attributes by displaying the state's natural beauty and attractiveness for tourism and residence. Those would be valid objectives, but difficult to quantify.

Recent Developments

As described in the previous section, legislation passed in 2021 opened new opportunities for motion picture production companies to claim tax credits (instead of rebates), and to claim credits or rebates for employees who are veterans or for veteran-owned businesses. None of the eligible projects considered in this paper chose to take these new options or claim these new credits. Legislation passed in 2023, which only became effective in July 2023, has added additional layers of complexity to the analysis of the incentives provided by the DPMPIDA.

The tax credit versus rebate option is a puzzling opportunity to offer to rebate-eligible participants. The pre-2021 rebate program involved direct payment, while the tax credit option requires an offset of tax liability. However, the production companies that are set up to carry out these projects are unlikely to have any direct income tax liability. The tax credits are transferrable, so the production company could choose to allocate their credits to taxable entities involved in the production process, but more likely they would be sold (at a discount) to other outside entities. It would require unusual circumstances to make such an option preferable to the direct production-cost rebate.

Moreover, the addition of rebates (or tax credits) for the employment of veterans and outsourced contracts with veteran-owned businesses also seem at odds with the legislative intent of the DPMPIDA. Support for veterans is an admirable motivation, but it has little to do with supporting and cultivating a vibrant motion picture industry in Arkansas.

During its regular session in 2023, the state legislature added new features to the incentive structure.²⁷ First, the basic incentive for total production costs was raised from 20% to 25%. A new set of tax incentives was also introduced, offering an additional 5% for hiring below-the-line employees from Tier 3 or Tier 4 counties, as defined by the AEDC. The 5% is also applicable for payments to a business, as part of the production process, in Tier 3 or Tier 4 counties. Finally, an additional 5% for multi-project productions (e.g. a television series) was added. This 5% tax incentive would presumably be applied to total production costs.

The 2023 changes are, in our opinion, even more incongruous with the original legislative intent of the DPMPIDA than the addition of veterans to the mix. In fact, the latest changes dilute and detract from the incentive-value provided by the previous formula for the rebates (or credits).

Tax incentives, either rebates or credits, are intended to influence the decisions of those to whom they are offered. For an incentive to be effective, it must be worthwhile (and feasible) for the recipient to apply for it and receive it. As we see in the case studies here, none of the projects

²⁷ [Act 517 \(2023\)](#).

applied for tax credits instead of rebates, nor did any apply for veteran-related incentive payments. The new opportunities offered were evidently ineffective as incentives.

A major constraint on the incentives offered under the new package of options adopted in 2023 relates to the fact that the cap of 30% on any production expense was left in place. This limits the ability of production companies to exploit all of the features of the program that are intended to influence their decisions—to incentivize them.

With the production and post-production incentive raised to 25%, there is only 5% available remaining. The newest version of DPMPIDA continues to provide a 10% rebate or credit for hiring in-state below-the-line crew members, but only half of that can be claimed. If this structure was in place for the four projects considered in this paper, the production rebates (in Table 1) would be 25% higher and the employment rebates would be one-half of the actual payroll rebates claimed. As it was, the payroll rebate for the four films constituted only 0.7% to 3.1% of production costs. Whatever the incentive effect was for hiring in-state crew members, it is now half as large.²⁸

Table 11 compares the return-on-investment measures from Table 10 to those that would obtain under the recently adopted changes. With the higher level of incentives relative to total production costs, the returns to a \$1,000 tax incentive is lowered considerably. Project A clearly moves into the territory of clearly negative returns, while the returns on the other three projects decline by 13% to 16%. These calculations assume that the decision to hire in-state crew members would be unchanged, in spite of the erosion of incentives to do so.

Table 11:

Return on Investment: Impacts on Income Plus Tax Adjustment per \$1,000 Tax Incentive - Alternative Incentive Scenarios (Dollar values in thousands)					
Impact	Project A	Project B	Project C	Project D	Sum
As implemented	\$1.055	\$1.964	\$2.591	\$2.027	\$1.748
Using 2023 formulas	\$0.863	\$1.652	\$2.257	\$1.740	\$1.468
Raising the maximum	\$0.850	\$1.597	\$2.130	\$1.659	\$1.421

The third line of Table 11 shows the effect of expanding the maximum incentive payment so that the 25% rebate on total production costs and the 10% rebate on in-state below-the-line employment can both be accommodated. Total costs of the incentive program would be higher still, further reducing the calculated returns to investment.

²⁸ If the new structure was in place for the four projects considered here, the total rebates would range from 25.4% of production costs for Project A to 26.6% for Project C.

Note that the tax incentive for hiring workers from Tier 3 and Tier 4 counties is entirely ineffectual, so long as the 30% cap remains in place. After receiving half of the 10% rebate for hiring an in-state employee, there is no additional room under the cap for hiring from specific counties. For a multi-production project, the extra 5% incentive payment for production and post-production expenses means that there is no further incentive available for hiring in-state crew members or veterans, regardless of their county of residence.

Taken together, the recent modifications of DPMPIDA increase the incentive for bringing productions to the state, but reduce the other incentives that are intended to cultivate and sustain the film industry in Arkansas. With a cap on the total amount of the rebate or credit, the incentives that are overtly offered are less than they appear to be.

Conclusions

In this paper, we have taken a close look at four case studies of motion picture productions in Arkansas. Based on the detailed expense reports that were submitted with rebate applications, we were able to construct a detailed, customized IMPLAN model of the motion picture production industry in Arkansas, and then use that model to estimate the direct, indirect, and induced economic impacts associated with that sector.

After carefully documenting the expenses and payrolls of the four projects, we found that their total production cost was \$4.60 million, of which \$1.97 million (43%) went toward expenditures and \$2.62 million (57%) went toward payroll. Of the payroll expense, \$1.55 million went to out-of-state residents and about \$1.07 million was paid to Arkansas residents. Direct employment, in terms of annual full-time equivalents, was 22.6 employees.

The spending profiles for non-payroll expenses varied among the four projects, but were concentrated in retail, air travel, car and equipment rentals, hotel accommodations, and restaurant expenses. Such a profile is similar to what one might expect for tourism spending.

To calibrate the custom motion picture production industry, we estimated that the four films paid a total of \$89 thousand in excise and sales taxes, amounting to a tax rate of 4.5% of the value of purchased inputs to production.

Relative to the state's incentive payments to the sector, we found that for \$1 million of tax incentives, the total impact on value-added (state GDP) was \$4.06 million, generating \$1.71 million in Arkansas income and supporting 38.3 workers on an annualized, full-time equivalent basis.

Separate simulations for the four projects showed general similarities to the combined model, but with some differences attributable to their individual spending patterns. Of the four projects, the largest overall impacts, relative to the amount of the tax incentives claimed, were for projects that devoted more of their budget to payroll, especially for in-state employees. Projects with large out-of-state payrolls tended to have smaller induced impacts. Projects showed larger indirect impacts when production and post-production work was subcontracted to in-state firms.



In evaluating the tax incentive program of the DPMPIDA, we conclude that it has generally lived up to the expectations expressed in the legislative intent section of the DPMPIDA. Nevertheless, the efficacy of the program should be evaluated relative to the opportunity cost: the value of other tax incentive options. We hope that the findings and analysis in this paper can be useful in that regard.

As for recent changes to the DPMPIDA, we express strong skepticism of their likely value going forward. The increase in production cost tax incentive from 20% to 25% undoubtedly enhances the attractiveness of bringing a production to the state, but by leaving the cap of 30% maximum on any expenditure, the new scheme leaves little room for incentivizing the hiring of in-state crews, let alone the other priorities that have been added to the scheme. The higher rebate for total production costs also has the effect of lowering measures of return-on-investment to the tax incentive program.

