NORTH CAROLINA GENERAL ASSEMBLY

Legislative Services Office

George R. Hall, Legislative Services Officer

Fiscal Research Division *Mark Trogdon, Director*
300 N. Salisbury Street, Suite 619
Raleigh, NC 27603-5925
Tel. 919-733-4910 Fax 919-715-3589

Memorandum

To: Representative Rick Catlin

From: Patrick McHugh, Fiscal Research Division
Barry Boardman, Fiscal Research Division

Date: 04/03/2014

Subject: Preliminary Review of Handfield Film Study

Summary

At your request, Fiscal Research has conducted a preliminary review of *A Supply Chain Study of the Economic Impact of the North Carolina Motion Picture and Television Industry,* authored by Dr. Robert Handfield and commissioned by a group of North Carolina film commissions and the Motion Picture Association of America.

The Handfield report uses a supply chain methodology that includes interviews, surveys, and payroll data from various sources. While much of the data and methodology used in this report has not been made public, the report *incorrectly* concludes that the Film Production Credit's net contribution to the State is positive. FRD concludes that the reported positive return on investment is based on a series of misunderstandings of the State's tax laws, invalid or overstated assumptions, and errors in accounting.

Our analysis, which corrects for the most obvious errors in the Handfield report, shows that the Film Production Credit creates a negative return on investment. The errors identified in this memo where communicated to Dr. Handfield prior to publication of the report. However, as of this date, no response has been provided. Because some of the methods used in the Handfield report have not been fully vetted, the analysis in this memorandum is preliminary. A better understanding of those methods will only allow us to fine-tune our analysis, but we would not expect our conclusion that the Film Credit does not "pay for itself" to change. In fact, a more detailed report is likely to conclude that the loss to the State is even greater than we present here.

Table 1 below shows the return on investment calculation and the summary fiscal estimates contained in the Handfield report and the preliminary estimates generated by Fiscal Research after adjusting for the most serious errors in the report. Figure 1 can be found at the end of this memo and shows the specific adjustments.

Table 1: Summary Comparison of Handfield Fiscal Estimates with Revised Estimates Correcting for Errors in the Report

	Handfield Report Estimates		Preliminary Error Corrected Estimates	
	State (In Millions)	State & Local (In Millions)	State (In Millions)	State & Local (In Millions)
Revenues	$65.3	$85.4	$38.9	$51.0
Cost	$60.1	$60.1	$84.2	$84.2
Fiscal Impact	$5.2	$25.4	$(45.3)	$(33.1)
Fiscal Return per $1 in Credit	$1.09	$1.42	$0.46	$0.61

As shown above, once the most significant errors in the Handfield report are removed, the return on investment in State revenues falls to less than 50 cents on the dollar. Even when estimated local tax revenues are included, the Film Production Credit results in a net fiscal loss. Typically, when considering the benefit of a State-level tax credit, local tax gains are not included. However, as the Handfield report includes State and local revenues, both perspectives are included here.

The report is extremely vague about the underlying methodology used to estimate total employment and earning. We have not, to date, received satisfactory responses from the author on many of the questions related to the methodology and assumptions used in the report. While serious questions remain, our preliminary analysis does not attempt to alter the fundamental approach used in the Handfield report. Nevertheless, basic corrections of unsound assumptions and accounting problems make it clear that the Handfield report incorrectly asserts that the Film Production Credit "pays for itself" through increased tax revenue.

For more information about the errors in assumption or accounting contained in the Handfield report, and for a description of how the preliminary Fiscal Research estimates adjust for those errors, see the Methodology section below.

Methodology

Cost of the Credit

The Handfield report understates the cost of the Film Credit by almost $24 million. This error arises from using the FY 2012-13 cost reported by DOR ($60.1 million) instead the cost of credits earned by productions that are actually the basis of the report ($84.2 million). This mistake was pointed out to Dr. Handfield prior to publication, however the final draft still includes this major error in accounting. Due to lag time between when productions complete filming and when credit applications are filed and refunds paid, the FY 2012-13 cost does not reflect the cost of the credits earned by the 45 productions that are used to generate the tax revenues estimated by the Handfield report.

Appendix II on page 45 of the Handfield report shows the “direct” and “verified” spending of 45 production projects that primarily took place in 2012. In the rough draft of this report, Appendix II also contained a column listing the cost of credits earned for each project, but that column was omitted from the published version. Given the 25% refundable credit on all verified spending, the cost of credits listed in Appendix II totals approximately $84.2, which is actually slightly lower than the total cost listed in the rough draft of the Handfield report. Where productions that appear in Appendix II are also included in the 2012 DOR report, the cost of credits for individual films in Appendix II matches official information.[1] Fiscal Research also confirmed with DOR that costs reported in Appendix II also match the cost of specific films that are due to be included in the 2013 DOR report.

Therefore, $84.2 is the appropriate cost to use when estimating net fiscal impact and return on investment for films that were the basis of the Handfield report. Even though Appendix II of the rough draft listed a total cost of almost $84 million, the report uses the total cost of $60.1 which is the total cost of refund checks issued in FY 2012-13, which does not reflect the actual cost of credits associated with films that were used to estimate the revenue benefits of the Film Credit.

State Personal Income Taxes Paid

The Handfield report overstates the amount of personal income taxes paid by film production workers. The report claims that the State realized $19.6 million in personal income tax revenue from film production workers. While the report is extremely vague on how the $19.6 million figure was calculated, a preliminary review shows that film production workers did not generate this level of personal income tax revenue for the State.

First, the Handfield report claims to use a tax rate of 6.25% on personal income, where historical analysis of tax filings by Fiscal Research show the effective tax rate on personal income (once deductions and exemptions are included) is actually 4.75%.

Second, the amount of wages needed to generate $19.6 million in personal income tax revenue contradicts other data contained in the report. Using the higher 6.25% effective tax rate, $313 million in wages would be required to generate $19.6 million in personal income. At an effective tax rate of 4.75%, it would take $412 million in total payroll to generate this level of personal income tax revenue. Based on the report’s estimate for the total workforce in the film industry and average wages, total industry payroll was estimated at $224.8 million in 2012. The report also correctly indicates that historical evidence shows that 52% of total film production expenses go to wages. Using this apportionment of the total direct spend listed in Appendix II yields a total payroll of $203 million, and using verified spend yields a total payroll of $175 million. The table below summarizes this information.

[1] N.C. Department of Revenue. *Film Production Credits Received for Tax Year Ending in 2012*. http://dornc.com/publications/incentives/2013/01film_credits_12summary.pdf

Table 2: Estimates of Total Film Production Payroll Based on Different Data in the Handfield Report

Source of Revenue Estimate	Total Payroll (In Millions)	Tax Revenue at 4.75% (In Millions)
Report's Estimate of 4259 Workers Earning $52,800	$224.8	$10.7
Share of Direct Spend in Appendix II	$203.5	$9.7
Share of Verified Spend in Appendix II	$175.3	$8.3

These inconsistencies raise serious concerns about the internal consistency of the report and provide a strong indication that the estimate of $19.6 million is significantly inflated. Because the methodology used in the Handfield report to generate an estimate of total workforce and average salary remains unclear, this memo uses the personal income tax revenue estimate of $9.7 million that arises from using the historical apportioning (52%) of the Direct Spending reported in Appendix II of the report. Fiscal Research is still seeking further clarification as to what types of expenditures are included under Direct Spend, but not under Verified Spend, and it is entirely possible that using Direct Spend as the basis for estimating wages and personal income is overly generous. Nevertheless, it is clear that the $19.6 million estimate provided by the Handfield report is much higher than actual collections by the State.

<u>Sales Tax Paid on Goods</u>

The Handfield report overstates the sales tax revenue generated by purchases made by film productions. In part this error arises from assuming, as the Handfield report does, that sales taxes are collected on services, which was not the case in 2012. As a preliminary estimate, Fiscal Research applied the State and Local sales tax rates to only the share of film production expenses that were likely to be devoted to purchases of goods, and excluded services. Based on DOR reports from 2010 through 2012, roughly 26% of all film production expenditures went to purchase goods. Applying this percentage to the total Direct Spend reported in Appendix II of the Handfield report results in an estimated $4.8 million in State sales tax revenue and $2.0 million in local sales tax collections. It is important to note that not all goods are actually subject to the sales tax, so even this preliminary estimate is likely in excess of actual collections. The table below summarizes the estimates contained in the Handfield report and the preliminary estimates produced by Fiscal Research.

Table 3: Handfield Report and Preliminary Fiscal Research Sales Tax Estimates

Source of Estimate	State Revenue 4.75% Rate (In Millions)	Local Revenue 2% Rate (In Millions)
Handfield Report	$5.3	$3.4
Rates Applied to 26% of Direct Spend in Appendix II of Handfield Report	$4.8	$2.0

Taxes Paid by 4200 Workers and Families

The Handfield report significantly overstates the tax revenue generated when film workers spend their earnings. This estimate contains a variety of different tax streams, including sales tax, property tax, and special taxes on specific items. There are a variety of problematic assumptions made in the report that result in overstating the tax revenues, including:

- *Associates spouses' spending with Film Credit:* The report assumes that half of the 4200 film workers are married to a spouse that earns the same wage as the film worker. While this in itself could stand further justification, the key issue here is that the Handfield report assumes that all taxes generated when film workers' spouses spend their income can be credited to the existence of the Film Credit. In essence, this rests on the assumption that all of these film workers would move out of the State if the Film Credit were discontinued, which is extremely questionable if film workers are married to a spouse who earns the same yearly income as the film worker. Therefore, when Fiscal Research recalculated the tax revenue generated from consumer spending, only the income of the 4200 workers was used, instead of including the estimated tax revenue associated with 2100 spouses as well. In essence, by including the spending of spouses, the Handfield report overstates the tax revenue associated with film workers' consumer spending by 50%.
- *Includes Property Tax for both State and Local governments:* The report claims that both the State and Local governments realize $3.3 million in property taxes as a result of the Film Credit. First, the State does not collect property taxes. This error was pointed out to Dr. Handfield prior to publication but, as can be seen in the spreadsheet on page 47, this is still included in the published report. Second, it is incorrect to count Local property taxes as part of the benefit of the Film Credit. Even if the Film Credit were discontinued, and every film worker and their families moved out of North Carolina, it is extremely unlikely that property values would be measurably impacted. The real property would continue to exist, and whoever owns said property would still owe local property taxes. Taken together, claiming property taxes as a benefit of the Film Credit results in overstating the total State and Local revenue impact of the Film Credit by more than $6.6 million.
- *Assumes film workers travel 30,000 miles per year driving vehicles with an average fuel efficiency of 15 mpg:* The Handfield report asserts that the State receives $3.8 million in gas tax. This is based on the assumption that all film workers, and their spouses, travel 30,000 miles per year and drive vehicles with an average fuel efficiency of 15 mpg. In recalculating gas tax revenues, the only change made by Fiscal Research is to remove the 2100 spouses from the base that is used to calculate revenues, consistent with the logic outlined above. The resulting calculation yields gas tax collections of $2.5 million, instead of the $3.8 claimed in the report. However, even this estimate is likely inflated for the following reasons
    - While it is possible the film workers drive this many miles per year, this is likely due to many workers traveling to other states for film projects, so some portion of the gas purchases would not occur in North Carolina.
    - It is also unlikely that the average fuel economy of the vehicles the film workers drive is as low as 15 miles per gallon (mpg). According to the U.S. Bureau of Transportation Statistics, the average fuel economy for light duty short wheelbase

vehicles in 2010 had reached 23.5 mpg, and the average for long wheelbase vehicles had reached 17.2 mpg.[2] Even assuming that many film workers drive pickup trucks, the average fuel economy for such long wheelbase vehicles is still higher than the estimate used in the report.

The table below shows how these adjustments change the estimated tax revenue generated as a result of consumer spending.

Table 4: Handfield Report and Preliminary Fiscal Research Estimated Tax Revenue

Collecting Entity	Handfield Report (In Millions)	Preliminary Error Corrected Estimate (In Millions)
State Government	$12.7	$6.7
Local Government	$5.1	$1.3

Finally, it must be underscored that this analysis is based on accepting the report's estimate of 4200 workers earning approximately $60,000 per year. While this was used for the purposes of recalculating consumer spending tax revenues, there are still unanswered questions about how the estimates of total workforce and average income were generated. As such, it is likely that these preliminary estimates may overstate the actual tax revenue associated with film workers' consumer spending.

Tier 1 and Tier 2 Personal Income Taxes Paid

The Handfield report does not clearly describe how the estimate for personal income tax payments for Tier 1 and Tier 2 suppliers was generated. However, as was discussed previously, the Handfield report assumes a 6.25% personal income tax rate, when the real effective tax rate on personal income is actually 4.75%. As such, Fiscal Research recalculated personal income tax collections based on this lower effective tax rate. Given the lack of clarity in how the report arrives at its estimate, it is possible that this preliminary Fiscal Research estimate is still higher than actual collections.

Corporate Income Tax Revenue Based on Apportionment

The Handfield report incorrectly asserts that the State realizes $5.3 million in corporate income tax revenue through apportioning 5% of national film industry proceeds to North Carolina. This is an error because the business entities that film television shows and movies are not the same entities that conduct distribution. Because a different business entity films the movies and television shows, the apportionment formula used to calculate corporate tax liability for distribution companies are not impacted by the investment and employment associated with production.

The only business tax liability that can accurately be credited to the existence of the Film Production Credit are the payments made by companies that actually do the filming and

[2] U.S. Bureau of Transportation Statistics. (Accessed 3/31/2014). http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_04_23.html

production work and receive credit under the program. The Department of Revenue reports that business entities that filed for a Film Production Credit in 2012 paid a collective total of $606,272 in Corporate Income tax and $270,602 in Franchise Tax. Tax payments in 2011 were of a similar order of magnitude. Because of time lags between when filming occurs and when credits are claimed, we cannot be sure that the data for 2012 perfectly matches all of the productions that were included in the report. Therefore, the estimated business tax receipts were rounded up to an even $900,000 for the purposes of this analysis. On this basis it is clear that the Handfield report greatly overstates the business tax collections generated by companies that are engaged film production.

Film Induced Tourism

The Handfield report asserts that the State receives $9.7 million in sales taxes generated through "film induced tourism" and that local governments receive another $5.7 million. These estimates result from the untested and unsubstantiated assumption that 1% of all tourism in the State was a direct result of film activities taking place in North Carolina. There are several issues with this approach that make it extremely unlikely that film activities in the State actually generated anything close to the level of tax revenues that are claimed by the Handfield report.

First, there is no direct evidence that "film induced tourism" accounts for one percent of all tourist activity in North Carolina. This figure is taken from a study commissioned by proponents of film credits in Georgia and applied to North Carolina. There is no consensus in economic literature about how to track film induced tourism, the methodology of the Georgia study is not described, and no empirical work was done to see whether the findings from Georgia actually apply to North Carolina. Second, the total tourist spending figure that is used to calculate the one percent that is assumed to arise from film induced tourism includes both North Carolina residents and business travelers. Because it is extremely unlikely that dollars spent by North Carolina residents or business travelers would have been spent outside the state if North Carolina were not a location for filming, it is inappropriate to credit the Film Credit with attracting this spending.

Fiscal Research is still researching a robust method for identifying and tracking film induced tourism. Most of the studies that have attempted this enterprise rely on questionable data, use a variety of methodologies, and reach differing conclusions. In the absence of well-established findings, Fiscal Research reduced the figure contained in the Handfield report by one half, largely to remove the effect of North Carolina residents and business travelers. As this likely still represents an overestimation of the impact of film induced tourism, Fiscal Research does not endorse this estimate, but included it to avoid omitting whatever film induced tourism may have occurred.

Opportunity Costs not Addressed

It is worth noting that another aspect of measuring the net benefit of a tax credit, beyond a return on investment approach, would be to include opportunity costs of the credit such as higher tax rates or reduced public sector spending. Neither the Handfield report nor our analysis here attempts to weigh those types of trade-offs that would be associated with the Film Credit.

Summary of Adjusted Estimates

Figure 1 below summarizes the specific tax revenue and cost figures contained in the Handfield report and the preliminary estimates produced by FRD. As noted previously, the error-corrected estimates are based on the underlying methodology of the Handfield report. As many questions remain about the approach used in the Report, the error-corrected estimates are only intended for demonstration purposes. *By simply removing errors in assumption or accounting, it is clear that the central conclusion of the Handfield report, that the Film Credit generates positive fiscal returns, is incorrect.*

Figure 1: Comparison of Handfield Fiscal Estimates with Revised Estimated Correcting for Errors in Handfield Report

	Handfield Report		Preliminary Error Corrected Estimate		
Fiscal Impact	**State**	**Local**	**State**	**Local**	
State Personal Income Taxes Paid	$ 19,613,353	$ -	$ 9,666,491	$ -	
Sales Tax Paid on Goods and Services	$ 5,267,000	$ 3,359,057	$ 4,833,245	$ 2,035,051	
Local Occupany and Local Portion of State Tax Paid on Hotel		$ 1,632,061		$ 1,632,061	**
Sales Tax Paid on Rental Equipment	$ 1,605,895	$ 760,687	$ 1,605,895	$ 760,687	**
Local Property Tax on Rental Company Assets and Studio Property		$ 1,205,555		$ 1,205,555	**
Taxes Paid by 4200 Film Workers and Families	$ 12,746,219	$ 5,115,147	$ 6,758,001	$ 1,311,516	
Sales Tax Paid on Other Services	$ 2,287,490	$ 1,083,548	$ 2,287,490	$ 1,083,548	**
Tier 1 Suppliers Sales Taxes Paid	$ 1,819,384	$ 957,571	$ 1,819,384	$ 957,571	**
Tier 1 Supplier State Personal Income Tax Paid	$ 2,831,419	$ -	$ 2,151,878	$ -	
Tier 2 Suppliers Sales Taxes Paid	$ 520,066	$ 273,719	$ 520,066	$ 273,719	**
Tier 2 Supplier State Personal Income Tax Paid	$ 635,125	$ -	$ 482,695	$ -	
Corporate Income Taxes Paid Based on Apportionment	$ 5,287,500	$ -	$ 900,000	$ -	
Corporate Income Taxes Paid on Income of Tier 1 Suppliers	$ 2,365,057	$ -	$ 2,365,057	$ -	**
Corporate Income Taxes Paid on Income of Tier 2 Suppliers	$ 674,210	$ -	$ 674,210	$ -	**
Sales and Occupany Tax from Film Induced Tourism	$ 9,700,000	$ 5,790,000	$ 4,850,000	$ 2,895,000	
Total	**$ 65,352,718**	**$ 20,177,344**	**$ 38,914,413**	**$ 12,154,708**	
Cost of Credit	$ (60,144,669)		$ (84,217,560)		
Net Fiscal Impact (State)	**$ 5,208,049**		**$ (45,303,147)**		
Net Fiscal Impact (State and Local)	**$ 25,385,393**		**$ (33,148,439)**		
Return on Investment (State)	$ 1.09		$ 0.46		
Return on Investment (State and Local)	$ 1.42		$ 0.61		

**Shaded rows have not been vetted by Fiscal Research. In the absence of clear explanations of how these figures were generated, the estimates provided in the Handfield Report have been used for the purpose of summary. This does not however indicate that Fiscal Research endorses the accuracy of these estimates.