

**Estimating the Impact of the Massachusetts Film Production Tax Incentives –
A Preliminary Analysis**

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Background

In response to a request from a member of the Massachusetts state legislature, in May 2008 the Department of Revenue conducted a hypothetical “dynamic” analysis of the Massachusetts film industry tax incentives, using a model developed by Regional Economic Models, Incorporated (“REMI”). A dynamic analysis attempts to calculate the full impact on the economy and the state’s revenue stream of an increase or decrease in economic activity resulting from a tax law change, including the impact of “multiplier” and displacement effects. As noted in the Department’s annual film industry tax incentives report issued in March 2008, the Department does not yet have enough detailed information to conduct an analysis of the actual effects of incentives to date, although we hope to develop and incorporate such a study into our annual report next year¹. A \$100 million hypothetical annual tax expenditure million (as specified in the analysis request) would result from film production spending of \$400 million, and is consistent with the information from sales tax exemption applications (which are submitted just before or as a film begins production) received so far in calendar year 2008.

The REMI model simulates the structure of and interrelationships among the various parts of the Massachusetts economy, and can be used to calculate the impact of a tax law change on state economic activity and tax revenue collections. The tax revenue changes calculated by the REMI model can then be compared to the initial cost of the tax incentives to arrive at a net cost to the state. It should be noted that the Department of Revenue does not ordinarily make dynamic estimates of tax law changes, as there are uncertainties surrounding the correct application of such models in individual cases. The Department takes no position on the accuracy of the dynamic model’s estimates in this case, but presented the results of the exercise in response to legislator’s request.

For this type of analysis, the REMI model requires that assumptions be made regarding the amount of total spending on Massachusetts-based film productions and how that spending is divided between payroll and other production expenses. It also requires that, if known, the inputs be adjusted to account for the amount of payroll paid to non-Massachusetts residents. These assumptions are set out below.

Assumptions

Total Film Production Spending. At a tax credit rate of 25%, a hypothetical annual tax expenditure of \$100 million implies that film industry spending in the Commonwealth eligible for the tax incentives would total approximately \$400 million (for this exercise, we will ignore the relatively small amount of tax revenue foregone as a result of the sales tax exemption, which would reduce the amount of film production spending associated with a \$100 million tax expenditure). As noted above, this is consistent with projected film industry spending in calendar year 2008 based on sales tax exemption applications received to date. Of that \$400 million in production expenditures, we assume the following distribution of film industry spending, based on information from tax credit and sales tax exemption applications received since the program’s inception in 2006, as reported in Table 3 of DOR’s film industry tax incentives report:

- 64%, or \$256 million, is attributable to payroll spending on film productions
- 36%, or \$144 million, is attributable to non-payroll spending on film productions

Payroll Expenses for Non-Residents. Of the \$256 million in payroll spending, we assume that approximately 50%, or \$128 million, is attributable to payroll expenses for non-Massachusetts residents.

¹ See “A Report on The Massachusetts Film Industry Tax Incentives”, which can be accessed on DOR’s web site at http://www.mass.gov/Ador/docs/dor/business/outstate/March_2008_Film%20_Incentives.pdf.

This assumption is based on information from tax credit and sales tax exemption applications, which indicates that wages and salaries for employees paid more than \$1 million account for approximately 45% of total payroll projected to be eligible for tax credits. Virtually all employees earning more than \$1 million appear to be non-Massachusetts residents. Based on film credit and sales tax exemption applications, it is also evident that some of the payroll expenses for employees in the less than \$1 million category are for non-residents (including directors, producers, and their staffs), though at this time it is not possible to precisely identify this amount. We have assumed in this analysis that an additional 5% of payroll expenses is for non-residents (which is most likely a low estimate). This brings the total proportion of payroll expenses for non-residents up to 50% of total payroll expenses eligible for the 25% tax credit.²

While wages paid to non-residents are Massachusetts source income and thus generate personal income taxes for the Commonwealth (mainly through withholding taxes), because 90% of non-resident wages are paid to employees with salaries of more than \$1 million per production (who probably number fewer than 20 individuals), it is likely that most of that income is saved or spent outside the Commonwealth. In this analysis, we assume that 90% of payroll expenses attributable to non-residents is spent outside the state, which we base on economic theory as well as on a review of tax credit applications. Those applications indicate that most of the Massachusetts living expenses for employees at the \$1 million and over salary level (generally the principal actors, directors and producers of the films) – including meals, lodging, travel, entertainment, and other local expenses -- are funded through the production budgets. The assumption that 10% of non-resident payroll expenses is spent in the Commonwealth means that of the \$128 million in payroll expenses, about \$12.8 million would be recycled through the local economy and generate multiplier effects and additional tax revenue.

We further assume that direct payroll spending on film productions (including wages paid to non-residents) generates income tax revenue at two tax rates: 5.2% for non-residents, since the effective tax rate for high income wage earners is very close to the nominal tax rate of 5.3%; and 4.0% for residents, with the 4.0% rate taking into account that deductions and exemptions lower the effective tax rate of most taxpayers. We also assume that purchases made from non-payroll production spending are exempt from the sales and use tax.

Film Production Spending That Would Have Occurred in the Commonwealth in the Absence of Tax Incentives. Film production spending that would have occurred even in the absence of tax incentives should be subtracted from any calculation of increased economic activity generated by those incentives. While it is impossible to know how many “big budget” films would have been produced in the Commonwealth without the tax incentives, it is possible to identify locally produced television programs and commercials that have been produced in Massachusetts in the past (without any tax incentives) and presumably would have continued to be produced absent the tax credits. Based on a review of the 88 tax credit and sales tax exemption applications filed through the end of February 2008, we assume that 5%-10%, or \$20-\$40 million, in production spending (with a midpoint of \$30 million) would have occurred in Massachusetts in the absence of the tax incentives. This conservatively, though perhaps realistically, assumes that there would have been no major motion pictures filmed in the Commonwealth without the tax incentives.

Balanced Budget Requirement. The REMI model requires that an assumption be made as to how the tax incentives are to be funded. Since the Commonwealth is required to balance its budget each year, our

² The 50% in-state payroll spending assumption is roughly consistent with a study of the Louisiana film tax credits issued in 2005, which estimated that 60% of all spending eligible for tax credits (payroll and non-payroll) was out-of-state. See “Economic and Fiscal Impact of the Film Tax Credit Program”, Louisiana Legislative Fiscal Office, March 2005, at <http://lfo.louisiana.gov/files/revenue/FilmVideoIncentives.pdf>.

default assumption is that state spending would have to be reduced to fund the \$100 million tax expenditure minus the amount of tax revenue we assume would be collected from additional income taxes paid by those directly working on film productions. At the 5.2% (for non-residents) and 4.0% (for residents) tax rates noted above, the offsetting income tax revenue would be approximately \$11 million. Therefore, we have assumed that state spending would have to be reduced (or revenues increased) by \$89 million (\$100 million minus \$11 million) to maintain a balanced budget³. DOR does not have information on how such state spending cuts would be made, so we have assumed an across-the-board cut in government spending, as is common in analyses of this type.

For comparison purposes, we have also run the REMI model using the assumption that spending would not have to be reduced (or revenues increased) to fund the tax incentives. The reduced tax expenditure could be funded through reserves or prior fiscal year surpluses, though strictly speaking, a complete analysis would require that the model to be adjusted for the potential alternative uses of those reserve funds. For the purpose of this exercise, we have ignored this “opportunity cost” issue.

After extensive discussions with REMI staff, it was decided that the most appropriate method for conducting this analysis was to calculate direct job growth from film production spending not using the REMI model, but rather by using the known amount of wage and salary spending from sales tax exemption and tax credit applications. This method was chosen because the REMI model uses a measure of industry-wide average wages (based on data from the state’s Department of Labor and Workforce Development) to generate job estimates, and these industry averages appear to be significantly lower than wages paid for recent and current Massachusetts productions that have applied for the tax incentives. For example, the REMI model assumes that the average wage in the motion picture and film industry is approximately \$29,000 annually in calendar year 2008. Based on the film applications received to date, it appears that the average wage for those employees earning less than \$1 million per film may be significantly higher than \$29,000 annually. Though it is difficult to derive exact figures from the tax credit and sales tax exemption applications DOR has received thus far, we assume for the sake of this analysis an average salary range of between \$40,000 and \$70,000 an annualized basis. The \$60,000 midpoint of that range is close to the median salary for all wage earners in Massachusetts.

REMI Model Results

New Economic Activity in Massachusetts. Table 1 below shows the REMI model’s economic impact projections (including multiplier effects) of a hypothetical tax expenditure of \$100 million, which corresponds to \$400 million in film production spending. The table also shows the estimates of direct employment, which were generated outside the REMI model itself, as described above. Included are changes in Massachusetts total output (a broad measure of economic activity, or revenue generated), gross domestic product (the standard measure of value added economic activity, also referred to as gross state product or gross regional product), wages and salaries, and proprietor and other labor income. The projections include the direct and multiplier effects of the film production spending corresponding to \$100 million in tax expenditures. The table shows the projections under both the balanced budget requirement and assuming no balanced budget requirement.

³ Maintaining a balanced budget would normally require offsetting spending reductions or revenue increases equal to the static revenue cost of the tax credits -- in this case \$100 million. However, in this instance the offsetting revenue increase due to increased withholding is sufficiently clear and immediate to allow us to relax this requirement.

Table 1

**REMI Model Projections of Incremental Economic Impacts
Hypothetical \$100 Million Film Industry Tax Expenditure**

	Balanced Budget Requirement	No Balanced Budget Requirement
<u>Change In:</u>		
Total Massachusetts Output (\$ Millions)	\$633	\$720
Massachusetts Gross Domestic Product (MA GDP) (\$ Millions)	\$349	\$451
Total Labor and Proprietor Income (\$ Millions)	\$288	\$368
Wages and Salaries - Massachusetts Residents (\$ Millions)	\$154	\$214
Direct Wages and Salaries - Non-Massachusetts Residents (\$ Millions)	\$119	\$119
Proprietor and Other Labor Income (\$ Millions)	\$15	\$35
Total Massachusetts Employment	2,388 - 3,658	4,044 - 5,314
Direct Film Industry Employment	1,693 - 2,963	1,693 - 2,963
Indirect/Induced Film Industry Employment	155	156
Other Industry Employment (Indirect/Induced)	541	2,195

The REMI model projects that under a balanced budget requirement, Massachusetts total output would increase by \$633 million, state gross domestic product would increase by \$349 million, total labor and proprietor income would increase by \$288 million (including the wages and salaries paid to non-Massachusetts residents, which total \$119 million), and total employment would increase by 2,388-3,658, with direct employment in the film industry increasing by 1,693-2,963, indirect/induced film industry employment increasing by 155, and employment in other industries increasing by 541. With no balanced budget requirement, Massachusetts total output would increase by \$720 million, state GDP would increase by \$451 million, total labor and proprietor income would increase by \$368 million, and total employment would increase by 4,044-5,314, of which 1,693-2,963 would be direct employment in the film industry, 156 would be indirect/induced film industry employment, and 2195 in other industries.

It should be noted that the direct job estimates are full-time equivalents, while by their very nature film industry productions are temporary and sporadic, so that the jobs generated will not be full-time, but a series of one-time projects. Also, the direct job estimates cited above assume all employment generated by those film projects represent net new jobs, and that those employed on them would not have been employed elsewhere in other Massachusetts industries in the absence of the film productions. We have no way to calculate the amount of displacement from other sectors of the Massachusetts economy, but it is an important issue cited in a recent Federal Reserve Bank of Boston study of film industry tax incentives.⁴

⁴ See "Hollywood East? Film Tax Credits in New England, by Darcy Rollins Saas, Federal Reserve Bank of Boston, October 2006, which can be accessed at <http://www.bos.frb.org/economic/neppc/briefs/2006/briefs063.pdf>.

As calculated by the REMI model, the multiplier effects of film industry spending are reduced by three factors: first, a significant portion of the new direct film industry spending is paid to non-residents and out-of-state businesses, which generate little if any multiplier effects within the Commonwealth; second, under a balanced budget requirement, the \$89 million in government spending reductions create a negative multiplier effect; third, some of the film production would have occurred even without the tax incentives, so does not represent new economic activity in the Commonwealth. Under the balanced budget requirement scenario, film production spending of \$400 million leads to net new direct spending of \$174 million within the Commonwealth, after adjusting for the \$107 million in wages and salaries paid to non-residents that is spent outside of Massachusetts, \$30 million in film production spending that would have occurred in Massachusetts even without the tax incentives, and \$89 million in government spending reductions needed to maintain a balanced budget. (These calculations are shown in Table 2 on page 7 of this letter.) An analogous calculation (which is shown in Table 3 on page 8 of this letter) applies to the no-balanced budget scenario, which generates greater net new economic activity because no government spending reductions are assumed to take place. Further reducing the multiplier effect is that there is naturally some “leakage” out of the Massachusetts economy, reflecting the fact that some of the increased non-payroll spending and income generated by film productions is spent outside the Commonwealth.

Revenue Impacts. The revenue impact projections generated by the REMI model are shown in Tables 2 and 3 below. Table 2 assumes a balanced budget requirement, while Table 3 assumes no balanced budget requirement. The tables first show the payroll and non-payroll production spending used as inputs to the REMI model. The tables also show the amount of personal income tax revenue that DOR calculates would be generated from the direct payroll spending on film productions, which totals approximately \$10.9 million. The REMI model projects that, in addition to this income tax revenue, new budgetary tax revenue from new economic activity (mostly multiplier effects) would be \$4.4 million under a balanced budget requirement. This \$4.4 million is comprised of \$1.8 million in income tax revenue, \$0.7 million of corporate tax revenue, \$1.1 million of other taxes, primarily rooms tax, motor fuels tax, and cigarette tax, and \$1.9 million of sales and meals tax revenue which would be offset by the loss of revenue from the film production sales and meals tax exemption (assumed to be \$1.0 million based on past experience).

Finally, we have included the potential income tax revenue from the sale of transferable credits. The proceeds from the sale of credits constitutes income taxable at the 5.3% personal income tax rate or 9.5% corporate tax rate, with the corporate tax being calculated after income is apportioned to Massachusetts. We have assumed that 50% of the \$100 million in tax credits would be sold, with half of the sales being taxed at the personal income tax rate of 5.3% and the other half being subject to tax of 9.5%, after apportionment. As we cannot estimate apportionment directly we have assumed that the average corporate apportionment for film production companies is 2.6%, based upon Massachusetts state Gross Domestic Product (GDP) as a share of national GDP. These assumptions produce an effective tax rate of 2.8% on the \$50 million in transferred credits, yielding projected tax revenue of \$1.4 million.

Combining the REMI results with DOR’s calculations of personal income tax generated by direct payroll spending yields a projection of \$16.7 million of new Commonwealth tax revenues generated by each \$400 million in new film production spending in Massachusetts.

The REMI model also projects that, under a balanced budget requirement, an additional \$1.2 million in non-tax budgetary revenue would be generated, bringing the total budgetary revenue generated to \$17.9 million.

The REMI model projects that with no balanced budget requirement, new budgetary fund tax revenue from direct and indirect economic activity would be \$7.9 million in addition to the income tax revenue of \$10.9 million generated by the direct payroll spending on film productions. This \$7.9 million is comprised of \$4.2 million in income tax revenue, \$0.9 million of corporate tax revenue, and \$1.4 million of other taxes, primarily rooms tax, motor fuels tax, and cigarette tax, and \$1.5 million of sales and meal tax after subtracting the \$1.0 million of exemption. Adding in \$1.4 million in potential tax revenue from the sale credits brings the total budgetary revenue to \$20.2 million

The model also projects that, with no balanced budget requirement, an additional \$2.8 million in non-tax budgetary revenue would be generated, bringing total budgetary revenue generated to \$23.0 million.

Table 2

**REMI Model Projections- New Tax Revenues Per \$100 Million Hypothetical Tax Expenditure
Assumes Balanced Budget Requirement**

	Wages and Salaries (\$ Millions)	Non-Wage Production Costs (\$ Millions)	Total (\$ Millions)
<u>Inputs to REMI Model</u>			
Massachusetts Annual Film Industry Production Spending	\$256	\$144	\$400
<u>Minus</u>			
Film Industry Spending in Absence of Tax Incentives	-\$19	-\$11	-\$30
New Wages Paid to Non-MA Residents & Spent Out-of-State (45%)	-\$107	N/A	-\$107
New Massachusetts Spending Inputs for REMI Model	\$130	\$133	\$263
Massachusetts Government Spending Reductions to Balance Budget	N/A	N/A	-\$89
<u>Tax Revenue Calculations</u>			
Direct New Wages (Nets out Wages in Absence of Incentives)	\$237	N/A	\$237
<u>Personal Income Taxes Generated from Direct Film Spending</u>			
5.2% on Non-Resident Wages and Salaries	\$6.2	N/A	\$6.2
4.0% on Resident Wages and Salaries	\$4.7	N/A	\$4.7
Personal Income Taxes from Direct Production Spending	\$10.9	N/A	\$10.9
<u>From REMI Model -- Other Tax Revenue from Direct Spending and Multiplier Effects</u>			
Personal Income Tax			\$1.8
Sales/Meals Tax			\$1.9
Minus Impact of Sales Tax Exemption			(\$1.0)
Corporate Tax			\$0.7
Other Taxes (Rooms, Gasoline, Cigarette)			\$1.1
Total Additional Taxes from REMI Model			\$4.4
Potential Additional Income Tax Revenue from Sale of Credits (\$50 Million at 2.8%)			\$1.4
Grand Total - Additional MA Taxes from Increased Economic Activity			\$16.7
Additional Non-Tax Revenue from REMI Model			\$1.2
Grand Total, All Budgetary Revenue			\$17.9

Table 3
REMI Model Projections - New Tax Revenues Per \$100 Million Hypothetical Tax Expenditure
Assumes No Balanced Budget Requirement

	Wages and Salaries (\$ Millions)	Non-Wage Production Costs (\$ Millions)	Total (\$ Millions)
<u>Inputs for REMI Model</u>			
Massachusetts Annual Film Industry Production Spending	\$256	\$144	\$400
<u>Minus</u>			
Film Industry Spending in Absence of Tax Incentives	-\$19	-\$11	-\$30
New Wages Paid to Non-MA Residents & Spent Out-of-State (45%)	-\$107	N/A	-\$107
New Massachusetts Spending Inputs for REMI Model	\$130	\$133	\$263
Massachusetts Government Spending Reductions to Balance Budget	N/A	N/A	\$0
<u>Tax Revenue Calculations</u>			
Direct New Wages (Nets out Wages in Absence of Incentives)	\$237	N/A	\$237
<u>Personal Income Taxes Generated from Production Spending</u>			
5.2% on Non-Resident Wages and Salaries	\$6.2	N/A	\$6.2
4.0% on Resident Wages and Salaries	\$4.7	N/A	\$4.7
Personal Income Taxes from Direct Production Spending	\$10.9	N/A	\$10.9
<u>From REMI Model -- Other Tax Revenue from Direct Spending and Multiplier Effects</u>			
Personal Income Tax			\$4.2
Sales/Meals Tax			\$2.5
Minus Impact of Sales Tax Exemption			(\$1.0)
Corporate Tax			\$0.9
Other Taxes (Rooms, Gasoline, Cigarette)			\$1.4
Total Additional Taxes from REMI Model			\$7.9
Potential Additional Income Tax Revenue from Sale of Credits (\$50 million at 2.8%)			\$1.4
Total - Additional MA Taxes from Increased Economic Activity			\$20.2
Additional Non-Tax Revenue (May Include Non-Budgetary Revenue)			\$2.8
Grand Total - All Budgetary Revenue			\$23.0

Other Considerations

The estimates shown above do not take into account any economic impact resulting from increased exposure of the Commonwealth through films and other productions that are made in Massachusetts, or the benefits of having high-profile movie and television actors in the Commonwealth for extended periods of time, which in some cases might be tantamount to advertising. We are not aware of any economic model that can project such impacts, which depend on several variables, including how many people view the films made in Massachusetts, the demographics of the audience, whether particular motion pictures are set in Massachusetts and include recognizable Commonwealth scenery, and whether the films portray the state in a positive, negative, or neutral light.

The estimates also do not take into account any revenue that might be generated from income taxes on earnings of actors or producers who participate in the revenues or profits of the motion pictures after release. Whether any of this income would be Massachusetts source income and thus subject to Massachusetts tax would depend on the facts and circumstances of particular contractual arrangements and whether that income is already taxed by other states and thus not taxable in Massachusetts.

The estimates are also based on the types of films that have applied for film credits to date. Most of the credits generated thus far are the result of spending on so-called big budget film productions. Such productions usually employ non-resident actors who are paid more than \$1 million per film. According to applications received through February 2008, wages paid to actors earning \$1 million or more account for 45% of total wages paid, most of which we have assumed are spent or saved out of state and thus generate no multiplier effect within the Commonwealth. To the extent that future productions (such as local television series or smaller budget films) pay a higher proportion of wages to Massachusetts residents, the multiplier effect, and the tax revenue generated, will be higher than currently estimated.

It should be noted that although this analysis assumes that \$100 million in film tax credits would be available to reduce tax payments, the static revenue cost to the Commonwealth would be less than \$100 million to the extent that taxpayers do not have sufficient tax liability to make use of the credits, and claim the credits under the 90% refundability option (as opposed to selling them to taxpayers who do have sufficient tax liability to utilize the full amount of the credits). If all credits were claimed as refundable, the revenue cost of the credits would be \$90 million, not \$100 million. (On the other hand, refunded, as opposed to transferred, tax credits do not generate taxable state income, so would result in lower offsetting tax revenue to the state.) Virtually all credits claimed to date have not taken advantage of the refundability option, though this is primarily due to the fact that the option was not added until July 2007 (retroactive to January 1, 2007). We do not know what proportion of the credits will be claimed as refundable in the future.

A final consideration relates to the timing of economic and tax impacts. This analysis assumes that, under the balanced budget requirement, the tax expenditure and the reduction in government spending needed to maintain a balanced budget occur in the same year as the increased economic activity resulting from the tax incentives. In reality, since it takes time for production companies to file annual tax returns (if they have tax liability in the Commonwealth or claim a refundable credit) or for transferees to reduce their estimated payments or file tax returns (if the credit is sold to a third party), there may be a lag of up to one year between the initial economic impacts of the tax incentive and the revenue reductions and required spending cuts needed to maintain a balanced budget. This means that in the first year the tax incentive program is in place, the net economic and revenue impacts could be closer to that shown under the no balanced budget requirement. After the first year, however, when the tax expenditures and spending reductions needed to maintain a balanced budget come into force, the impacts would be as shown under the balanced budget requirement scenario.

Comparison with Other Tax Incentives

As we noted earlier, the Department does not ordinarily produce dynamic analyses of tax law changes, so it is not known how the film industry tax incentives, which in this analysis are estimated to generate offsetting tax revenue of \$17.9 million to \$23.0 million for each \$100 million tax expenditure, compare to other tax incentives in terms of economic activity and tax revenue generated. In order to place the film tax incentive in the context of tax incentives generally, it should be noted that most studies of tax incentives show that increases in economic activity induced by the incentives produce tax revenue that is lower than the amount of the tax expenditures themselves. For example, recent studies of the Massachusetts investment and research tax credits conducted for the Associated Industries of Massachusetts by Ernst & Young (which also used the REMI model) estimated that the dynamic impact of those tax incentives lead to increased tax and non-tax revenue equal to 54% and 11%, respectively, of the amount of tax expenditures.⁵ (These estimates of offsetting tax revenue may be too high, as it is not clear that a balanced budget requirement was imposed or whether non-budgetary revenues were counted in the analyses.) Whether a tax incentive program is desirable is not solely a function of how much revenue it generates, but also whether the economic activity that it causes is judged to be favorable for the Commonwealth. The Department does not take any position on the desirability of particular tax incentive programs.

We should reiterate that this analysis is based on a *hypothetical*, not actual, film incentive tax expenditure, and that once actual data are analyzed from tax credit applications, the results will undoubtedly differ somewhat from those shown above. We hope to have actual data available for next year's report on the film industry tax incentives.

⁵ See "The Economic and Fiscal Effects of the Massachusetts Investment Tax Credit" and "The Economic and Fiscal Effects of the Massachusetts Research Credit". Both reports can be accessed at the web site of the Associated Industries of Massachusetts, at the following URL:
http://www.aimnet.org/AM/AMTemplate.cfm?Section=Foundation_Reports&Template=/TaggedPage/TaggedPageDisplay.cfm&TPLID=67&ContentID=4240.