Training: Cost-Benefit Analysis and Tax Incentive Evaluations

This training session reviews how to employ cost-benefit analysis in tax incentive evaluations and provides a detailed walk-through of key factors to consider when using this method. The training includes a demonstration of how cost-benefit analysis has been used to evaluate major incentive programs in Rhode Island.

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Background



- The Office of Revenue Analysis (ORA) is required to produce, in consultation with other state agencies, a report that contains analyses of economic development tax incentives as listed in R.I. Gen. Laws § 44-48.2-3(1).
- These reports provide a comprehensive information regarding the tax incentives and their recipients and breakeven cost-benefit analysis for each tax incentive.
- The goal of these incentive evaluation reports is to discuss relevant policy findings and recommendations that could help in the decision process as to whether the tax incentive should be continued, modified, or terminated.

Introduction

Madiha Zaffou, Rhode Island ORA

Here is some background regarding the mandates of the <u>evaluation reports</u> that our office, the <u>Office of</u> <u>Revenue Analysis</u> under the <u>Department of Revenue</u>, is required to produce on a regular basis. These reports usually provide comprehensive information regarding the tax incentive program, as required by the <u>governance statutes</u>.

The reports include information such as credit usage amount over time, taxes paid by recipients, and taxes paid by the employees of the recipients. We go beyond these requirements and include additionaldata and analyses that address other aspects of the programs. In addition to this, and most importantly, we do a detailed breakeven cost-benefit analysis using different metrics. The goal of each one of these reports is to provide recommendations to policymakers that would help improve the incentive program.



Here are some of the data challenges we faced when we worked on these evaluation reports, and how we dealt with them. The first is the availability of the data: We often struggle to find the necessary data, because we need to pull together relevant information that is usually scattered in various forms across multiple government agencies, if it exists at all. Sometimes the data needed to complete a useful assessment is not available.

One reason for this is that data is not captured in the program's administrative forms. This is usually because the administrative agencies select which companies are eligible to receive the incentives or they process the tax returns when the incentive recipients redeem them, but do not conduct any <u>economic</u> <u>impact analysis</u>, and therefore do not collect the data. Another reason could be that the data needed is being captured within the administrative forms, but businesses do not always comply with thereporting requirements and supply this information.



Availability of the data: Example

- Motion Picture Production Tax Credit (MPPTC) recipients are required to submit an annual report (RI Form 8201A) to the Division of Taxation.
- 11 out of 13 MPPTC recipient firms failed to comply with the requirement to submit the 8201A form.
- Compliance with the annual report is legally required per R.I. Gen. Laws § 44-31.2-6.1(h), but there are no consequences specified for non-compliance.

For example, the <u>Rhode Island Motion Picture Production Tax Credit</u> (MPPTC) program has high noncompliance with data reporting. Normally, recipients of this credit are required to submit an annual report to the Division of Taxation. This report includes detailed firm-level data such as entity name, address, and federal identification number, as well as detailed employee-level data such as employee type, name, Social Security number, wage hours worked, and so on.

In our evaluation, 11 of 13 motion picture tax credit recipient firms failed to submit this form. Therefore, the analysis we did for this program was primarily based on the motion picture production spending data (we dive deeper into this in the second part of the training). To help solve this noncompliance issue, we provided a detailed discussion in the recommendation section on their reporting issues and how they can be addressed. If you look at the evaluation reports we did for this program, you will see numerous suggestions for how to improve it.



Access to the data:

- Taxpayer confidentiality constitutes a major obstacle for conducting a high-quality analysis for tax incentive programs.
- Even with the presence of memorandums of understanding (MOU) with other agencies, confidentiality restrictions can prevent access to relevant data.
- Beneficiaries of tax incentive programs must specifically consent to sharing these data with any state agencies tasked with evaluation as a condition of receiving the tax benefit.

Another challenge is <u>data access</u>. Much of the data that is useful for evaluating tax incentives is either sensitive or confidential. Privacy laws and regulations make it difficult and sometimes impossible to utilize administrative taxpayer data for tax incentive evaluation. Even though Rhode Island <u>governing statutes</u> of the tax incentive evaluation act of 2013 require all state agencies to cooperate with our office by providing the necessary information, we sometimes struggle to convince these agencies thatwe are legally entitled to access that data.

We do have memorandums of understanding (MOUs) with several state agencies, including the Division of Taxation, the Rhode Island Commerce Corporation, and the Department of Labor and Training. These MOUs clearly state that we need access to the data only in order to analyze an incentive program's performance, and that we will not publish sensitive company-specific information. However, we still get some resistance and we are limited in terms of how much taxpayer information we receive. One way to overcome this would be to require tax incentive recipients, as a condition of receiving the benefit, to share their data with any state agency tasked with evaluating the tax incentive.



Usability of the data:

- Even when data is available, lack of clear guidance and definitions on some forms makes the data insufficient for purposes of tax incentive evaluation.
- The data is usually collected by various agencies (e.g., Taxation, commerce, and workforce departments) as a part of their administrative responsibilities in a format that is not suitable for an economic impact analysis.

The last data challenge I would like to discuss is usability of the data. Even when data is available, it may not be useful for evaluation purposes. Different agencies collect data on incentive programs and their beneficiaries as part of their day-to-day administrative responsibilities. The data collected by these agencies is mostly enough to verify statutory compliance but may not be adequate for an economic analysis.



Usability of the data: Example

- Rhode Island New Qualified Jobs tax incentive program provides a tax credit for newly created jobs in specific industries.
 - ➤The targeted industries specified by this program do not follow the North American Industry Classification System (NAICS).
 - ORA created a breakdown of the program's targeted industries by specific NAICS Codes.

For example, our most recent evaluation report is on the <u>Rhode Island New Qualified Jobs program</u>, which provides a tax credit for companies creating new jobs in the state, especially in certain fields and industries. The program offers an extra credit bonus to businesses that operate in the specified fields; however, the targeted industries are not selected according to the <u>North American Industry</u> <u>Classification System</u> (NAICS). This means the data is unusable when conducting the economic impact analysis of the program.

Because the industries did not line up with NAICS, we had to create a breakdown of the programs' targeted industries by specific NAICS codes in order to proceed with the analysis, we made some assumptions about which NAICS industry belonged in each field based on a description of the targeted fields that the Rhode Island Commerce Corporation had on its <u>website</u>. It may not be exactly what they meant, but in the absence of specific data, this is the best we could do.

Elements of a Cost-Benefit Analysis

Modeling Costs



Now we will turn to cost-benefit analysis. I will first discuss how we model the cost piece, then how we model the benefit, and, finally, how we do a breakeven cost-benefit analysis.

Incentive costs: In previous reports published by our office, we considered two options for modeling the alternative uses of resources dedicated to the tax incentives analyzed: government expenditure response and tax policy response.

The government expenditure response scenario assumes that the tax incentive is funded by an equivalent reduction in state government spending. For example, if the tax credits issued in a certainyear total \$5 million, the legislation would respond to this revenue loss by reducing government spending by \$5 million that year.

In the Regional Economic Models Inc. (REMI) model, we implement this as a series of exogenous <u>final</u> <u>demand adjustments</u> to account for state spending on multiple services. We also make an adjustment to state government employment and state government compensation rather than using the default REMI assumption. I would like to highlight that under this approach we do not include the cost of administering the program because in the absence of the program this amount would simply be shifted

to some other government expenditure, and we are unable to make any more specific assumptionsabout the economic impact of tax credit administration versus the next best alternative. The other approach for modeling the cost is the tax policy response, which assumes that the availability of the tax incentive program would result in a broad-based business tax increase. In this case, the legislature would respond by raising taxes. In the REMI model, this is modeled as an increase in production costs in all Rhode Island industries, where production costs by industry are weighted by eachindustry's value added. In this approach we include the cost of tax incentive administration because in the absence of the tax incentive, cost of administration is a related expense that could be passed on to taxpayers in the form of a tax increase.

For the remainder of this presentation, we will focus on the government expenditure response approach, as this is the one we use in our evaluation reports. To give you an idea of how this approachworks, we will walk through the steps of this modeling process.

Cost of the Tax Incentive "Gov't Expenditure Response" Example from the raw expenditure data



| Agency | Agency Name | Program Name | Sub Program Nar | Natural Account Name | Category Category Name | Personnel Category Name | 2018 Actuals |
|--------|-----------------------------|------------------|-----------------|--|-----------------------------------|-----------------------------------|--------------|
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Regular Wages | 10 Salary and Benefits | Direct Salaries | 1,368,705 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Payment For Deferred Furlough Days | 10 Salary and Benefits | Direct Salaries | c |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Overtime (1.5) | 10 Salary and Benefits | Overtime | 129,692 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Holiday Pay | 10 Salary and Benefits | Holiday | 1,486 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Medical Insurance Waiver Bonus | 10 Salary and Benefits | Health Benefits | 7,863 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Stipend Payments | 10 Salary and Benefits | Contract Stipends | 8,125 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Payroll Accrual | 10 Salary and Benefits | Payroll Accrual | -233 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Employees' Retirement | 10 Salary and Benefits | Retirement | 339,109 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Defined Contribution Plan | 10 Salary and Benefits | Retirement | 13,298 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Retirement Contribution per RIGL 36-10 | 10 Salary and Benefits | Retirement | 1,282 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Retirement: LIUNA | 10 Salary and Benefits | Retirement | 53,646 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | FICA: Social Security | 10 Salary and Benefits | FICA | 113,597 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | FICA: Medicare | 10 Salary and Benefits | FICA | -586 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Medical Insurance | 10 Salary and Benefits | Health Benefits | 218,225 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Dental Insurance | 10 Salary and Benefits | Health Benefits | 15,655 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Vision Insurance | 10 Salary and Benefits | Health Benefits | 2,358 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Assessed Fringe Benefits | 10 Salary and Benefits | Assessed Fringe Benefits | 34,359 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Retiree Health Insurance | 10 Salary and Benefits | Retiree Health | 81,671 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Training and Education Services | 30 Contract Professional Services | Training and Educational Services | 300 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Veterinary Services | 30 Contract Professional Services | Medical Services | 17 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Maintenance/Repairs: Office Equip | 40 Operating Supplies and Expense | es Not Personnel | 3,570 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Maintenance/Repairs: Other Equip | 40 Operating Supplies and Expense | es Not Personnel | 6,772 |
| 81 | DEPARTMENT OF PUBLIC SAFETY | Municipal Police | Fire Marshal | Clothing and Accessories | 40 Operating Supplies and Expense | es Not Personnel | 26,497 |

This is a snapshot of actual Rhode Island expenditure data, straight from the Rhode Island financial statement database, the platform we query to download state spending data. As you can see, the data is very detailed—we could not fit all the data fields in one slide.

What we are interested in is the variable "natural account name." Using this variable, we constructed a crosswalk that maps each natural account to the appropriate REMI NAICS industry. We looked at each natural account code and category and its description, then we tried to determine which REMI NAICS sector it would fall under.



| laturalAcct 📰 NatAcctCat | NatAcctDesc | Remi70Sector |
|---|---|--|
| 631001 Contracted Professional Services | Financial Services (Budget Only) | Professional, scientific, and technical services |
| 631010 Contracted Professional Services | Financial Services: Accounting/Auditing | Professional, scientific, and technical services |
| 631020 Contracted Professional Services | Financial Services: Investment/Banking | Professional, scientific, and technical services |
| 631030 Contracted Professional Services | Financial Services: Actuary | Professional, scientific, and technical services |
| 631040 Contracted Professional Services | Financial Services: Economists | Professional, scientific, and technical services |
| 631050 Contracted Professional Services | Financial Services: Other | Professional, scientific, and technical services |
| 631100 Contracted Professional Services | Public Relations Services | Professional, scientific, and technical services |
| 631200 Contracted Professional Services | Management Consultants | Professional, scientific, and technical services |
| 632001 Contracted Professional Services | Information Technology Services | Professional, scientific, and technical services |
| 632140 Contracted Professional Services | Information Technology: Programming | Professional, scientific, and technical services |
| 632150 Contracted Professional Services | Information Technology: System Design | Professional, scientific, and technical services |
| 632160 Contracted Professional Services | Information Technology: System Support | Professional, scientific, and technical services |
| 632170 Contracted Professional Services | Information Technology: Database Administration | Professional, scientific, and technical services |
| 632180 Contracted Professional Services | Information Technology Services: General | Professional, scientific, and technical services |
| 633001 Contracted Professional Services | Training And Educational Services (Budget Only) | Educational services |
| 633100 Contracted Professional Services | Training and Educational Services | Educational services |
| 633200 Contracted Professional Services | Seminars and Conferences | Educational services |
| 633300 Contracted Professional Services | Training Consultants | Educational services |
| 634001 Contracted Professional Services | Design, Engineering, Surveying And Environmental Services (Budget Only) | Professional, scientific, and technical services |
| 634100 Contracted Professional Services | Engineering Services | Professional, scientific, and technical services |
| 634200 Contracted Professional Services | Architectural Services | Professional, scientific, and technical services |
| 634300 Contracted Professional Services | Surveyor Services | Professional, scientific, and technical services |
| 634400 Contracted Professional Services | Environmental Services | Professional, scientific, and technical services |

The slide above shows an example of how this crosswalk is done. Rhode Island REMI model has 70 NAICS industries in total. Once we finished the crosswalk exercise, we constructed a table that shows the breakdown of state expenditures across the 70 NAICS sectors.



| Industry Description | NAICS Code | Percent of Total |
|---|--|------------------|
| Ambulatory Healthcare Services | 621 | 32.1% |
| Educational Services | 61 | 30.5% |
| State Wages, Salary, and other Compensation | n/a (entered as "state/local govt. compensation" and "employment") | 25.6% |
| Social Assistance | 624 | 2.9% |
| Local Government Spending | n/a (entered as "local government spending") | 2.9% |
| Professional, Scientific, and Technical Services | 54 | 1.4% |
| Administrative and Support Services | 561 | 1.5% |
| Wholesale Trade | 42 | 0.6% |
| Remaining/Other | 19 additional industries | 2.6% |
| | Total: | 100.0% |

| Industry Description | Amount (SM) |
|---|-------------|
| Ambulatory Healthcare Services | -\$1.61 |
| Educational Services | -\$1.53 |
| State Wages, Salary, and other Compensation | -\$1.28 |
| Social Assistance | -\$0.15 |
| Local Government Spending | -\$0.15 |
| Professional, Scientific, and Technical Services | -\$0.07 |
| Administrative and Support Services | -\$0.08 |
| Wholesale Trade | -\$0.03 |
| Remaining/Other | -\$0.13 |
| Total | -\$5.00 |

This is what state spending by NAICS industry looks like. Again, we could not fit all the sectors in one slide, so here we are showing the ones with the highest spending percentages. Most state spending is on ambulatory health care services, educational services, and state wages and other compensation. We use these percentages to distribute the actual costs of the tax incentive. The table to the right shows an example where the total amount of the tax incentive is \$5 million. The distribution of this \$5 million across the NAICS industries will follow the same pattern as in the table on the left.

You will recall that when state governments forgo revenue by allowing a tax incentive, there are fewer funds available for other spending priorities. In this case, the state will reduce spending on ambulatory health care services by 32.1%, or \$1.61 million. In the coming slides, we have a REMI demonstration on how this is done to help you better understand this approach.



Rhode Island General Fund Expenditures by Agency Groups

| Agency Groups | Percent of Total |
|--|------------------|
| Elementary and Secondary Education | 38.80% |
| Health Care Services (Medicaid) | 37.78% |
| Behavioral Health and State Hospitals | 5.15% |
| Children, Youth and Families | 4.94% |
| Health and Human Services (Non-Medicaid) | 2.78% |
| Higher Education | 2.72% |
| General Government | 2.31% |
| Corrections | 1.81% |
| Economic Development | 1.52% |
| Courts | 0.69% |
| Public Safety | 0.50% |
| Elected Officials | 0.46% |
| Environment | 0.45% |
| Other | 0.10% |
| Grand Total | 100.00% |

In addition, the state spending data is organized by each state government agency. We then combine these agencies into groups based on their functions and duties. The table above describes the breakdown. This covers the cost of the incentive and how we model it.



- The tax incentive is funded by an equivalent reduction in state government spending.
- General fund expenditures are compiled for the year within the scope of the analysis, then broken down into NAICS industries.
- The level of these expenditures could be adjusted to maintain a balanced general fund budget.
- The cost of the tax incentive is the amount issued by the Division of Taxation in the time period subject to the analysis.

To recap, the government expenditure response scenario assumes that the tax incentive is funded by an equivalent reduction in state government spending, within the constraints of a balanced budget, and that this reduction in spending is in the same proportion as current spending. When we analyze the expenditure data by industry, we distribute the actual costs of the tax incentive in the same way. And finally, the cost amount that we model is the tax incentive amount issued by the Division of Taxation in the time period subject to our analysis.

Example: REMI Demonstration*

| 8 | | Tax-Pi | 7 🗖 🖲 |
|-------------------------------|-------------------------|--|-------|
| | Rhode Island • Single | Region • 70 Sectors • History 2001 - 2018 • Forecast 2019 - 2060 | |
| R View Forecast | ~ | Regional Profile What's New | |
| Budgets Budgets Studies | New Regional Simulation | New National Simulation | |
| Cost Statings | New Regional Control | المنابع New National Control | |
| Cose | Regional Forecast | National Forecast | |

Now let's look at a quick REMI demonstration. My colleague is going to do more REMI demonstrations in the second part of this training. I will highlight the expenditure parts of our budget file. REMI <u>Tax-PI model</u> is pictured above. Shown below is where our budget file is for FY 2020.

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|--|------------------------------|---------|
| Budget Calibration - FY2020 Ri Budget_Final | - ¤ × | |
| | | |
| Options Budget Forecast Feedback Aggregations | Save <u>C</u> ancel | |
| A Budget | | |
| Setup a budget by adding revenue and expenditure items and entering budget values. Double-click on an item or press the Edit calibrating the budget item's behavior. | button to access options for | |
| Revenues Expenditures | | |
| Select which years are displayed on the budget grid | | |
| Add Expenditure Display Settings 2003 2009 2009 | | |
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| Construction Development 25117404 | | |
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| So Model Details | | |
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| We define definition Constraint definition | | |
| Help W Health Statistics 20059673 | | |
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Below is the revenue part of the budget file. Revenues are broken down according to source. We are looking at what different groups generated in taxes, including business corporation taxes, sales and use taxes, and so on.



We also have our expenditure data broken down by state government agency groups. Each budget item here (and by "budget item," I mean both revenues and expenditures) is connected to a policy variable that shows how the budget item is tied to the state economy. When a policy variable changes a budget item, the associated model variable will automatically be changed, and the change will flow through the economy. The model has a variety of policy variables that you can choose.

*Note: The software discussed and screenshots are from the software owned and provided by RegionalEconomic Models, Inc.

| Business Corporations | | | | | | | | | | | _ = × | | - 0 |
|--|---|---|--|--|---|---|---|---|---|---|---|-----------|----------|
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| automatically be changed. For best results, | choose a pol | licy variable | e that best | represents | how this bu | idget categ | ory works. | For example | e, a sales t | ax on consu | imer | | |
| goods could be matched with the Consumer | Price policy | variable. | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Most policy variables are associated with a | relevant resu | ult category | which is u | ised to spre | ad grouped | details. Af | ter selectin | g the variab | le, enter th | e percenta | ge of the | | |
| baseline value for each detail to be used wi | nen calculatin | ng spreadin | ng weights. | In the sale | s tax examp | le, if clothi | ng is taxed | at nair the i | ate of othe | r commodi | bes, | | |
| enter 50. If food is not taxed, enter 0. | | | | | | | | | | | | | |
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For example, above is a list of policy variables you can choose. In this case, we have the production cost policy variable associated with business taxes, but you can create your own variables. These are much more customizable than regular policy variables because they allow for modifications to be made to the input-output (IO) table data that dictates how the variable will affect different parts of the economy within the model.

Let's look at a quick example of how we do a custom variable:

| iame New Industry Sales | | |
|--------------------------------------|--|-----------------------------|
| Variables Details | •• 🔳 ••• | ? 🗙 Scenario Info 🛛 Cant |
| ustom Industry Output / Sales | | |
| Detail Region (1) Rhode Island Units | Detail Behavioral Health and State Hospitals20 Children, Yuuth and Families20 Corrections20 Courtis20 Economic Development20 Elected Officials20 Environment20 Health and Human Services20 Higher Education20 Other20 Public Education20 Public Safety20 | New Edt Delete |

You can see that these are all the custom variables we created for each state agency group.

| 🖉 Behavioral Health and | State Hospitals20.M | ICS | | | | - 6 > |
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| New Industry Outpu | t Variable | Modify IO Column | | | Compare | |
| Define a variable that will | adjust the | IO Column | Base | Custom ^ | | |
| compensation rate, produ | ctivity, and | Forestry and Logging; Fishing, hunting and trapping | 0.00021 | 0.00000 | | |
| industry-specific intermedi existing industry | ate demand for an | Support activities for agriculture and forestry | 0.00084 | 0.00000 | | |
| Existing industry. | | Oil and gas extraction | 0.00976 | 0.00000 = | | |
| Salact a Base Induct | | Mining (except oil and gas) | 0.00260 | 0.00000 | | |
| Select a base moust | | Support Lativities for mining | 0.00002 | 0.00000 | | |
| Base Industry | | Utilities | 0.00696 | 0.00012 | | |
| State and Local Governme | ent 🔍 | Construction | 0.03111 | 0.00000 | | |
| Detailed Caluma | | Wood product manufacturing | 0.00000 | | | |
| Detailed Column | | Nonmetallic mineral product manufacturing | 0.00000 | | | |
| None | × | Primary metal manufacturing | 0.00000 | | | |
| Select a base industry that | t is similar to the | Fabricated metal product manufacturing | 0.00312 | 0.00000 | | |
| new industry that you wou | uld like to create. | Machinery manufacturing | 0.00177 | 0.00000 | | |
| The employment, output, | wages, etc. | Computer and electronic product manufacturing | 0.00163 | 0.00000 | | |
| | | Electrical equipment, appliance, and component manufacturing | 0.00179 | 0.00000 | | |
| | | Motor vehicles, bodies and trailers, and parts manufacturing | 0.00296 | 0.00000 | | |
| | | Other transportation equipment manufacturing | 0.00012 | 0.00000 | | |
| | Year | Furniture and related product manufacturing | 0.00005 | 0.00000 | | |
| Select a Base Year | 2020 | Miscellaneous manufacturing | 0.00261 | 0.00000 | | |
| | 0.000 | Food manufacturing | 0.02363 | 0.00000 | | |
| Select a base year for the | new variable. The | Beverage and tobacco product manufacturing | 0.00509 | 0.00000 | | |
| new variable will create adjustments to the base variable using the differences between | | Industry Options | | | | |
| year. | ounnis in uie base | Specify the labor productivity and compensation rate for the custom industry output variable. | | | | |
| | | Nominal \$ (000s) | | | | |
| | | Compensation Rate | | 113.139 | Base | Custom |
| | | Labor Productivity | | 146.190 | 0.000 | Service w |

The preceding slide shows the behavioral health and hospitals input-output table. The base column is what the model has by default. The column includes REMI's standard industry assumptions for the input-output table, and these assumptions are based on Bureau of Economic Analysis (BEA) input-output data. The base column shows the distribution of \$1 of government spending across all these NAICS industries. The Custom column is where we can adjust these IO figures. If you remember from thelast two slides, we had state spending broken down by NAICS industries for each state agency group. And that's what we enter in the Custom column. We do this for each state agency group in the budget file.



Modeling Benefits

The second part of cost-benefit analysis involves modeling the benefits generated by the tax incentive program. To do this, these are the steps we usually follow:

First, we examine the program's governance statute to determine the goals and objectives the program is trying to achieve. Normally, the success of a tax incentive program is related to how many goals and objectives were achieved. In the absence of statutory goals, it becomes very difficult for us to evaluate the tax incentive because the behavior the program is trying to incentivize is not very clear. In situations like this, we go through the statutory description of the program and look at the way it's designed. We then try to infer the purpose and intent of the tax incentive in order to proceed with the analysis.

Next, we address this issue in the recommendations section by asking policymakers to define specific and clear goals the program is intending to accomplish. In step two, we try to determine the data that

would be necessary to address these objectives. We check the governance statutes and the websites of the administrative agencies to see which forms are being filled by the tax incentive recipients when they apply to the program to get an idea of what data is being captured. We then typically request the data from the administrative agencies, such as the Division of Taxation and the Commerce Corporation.

And finally, after receiving the data we proceed with the economic impact analysis using the REMImodel.

So, based on the program's goals and the data we collected, we try to determine the appropriate policy variables to use in the REMI model and what industries to include in the analysis. Sometimes we must make our own assumptions regarding the appropriate mix of incentives recipients.

Example

CVS is headquartered in Rhode Island and receives many tax incentives from the state. The data we receive on CVS usually classifies this company in the <u>retail trade</u> sector. But in our analysis, we use the <u>management of companies and enterprises</u> sector instead, because we know that the incentive is aimedat increasing CVS employment at its headquarters, not its retail locations. What we try to capture in the analysis is the industry of the incentivized activity, which is not necessarily the industry of the incentive recipients.

Benefits of the Tax Incentive Example



- Step 1: most of the time the goals are:
 - ➢Promote the creation of new jobs, attract new business and industry, and stimulate growth in businesses that are prepared to make meaningful investment and foster job creation in Rhode Island.
 - ➤Through the establishment of a jobs incentive program, Rhode Island can take steps to stimulate business expansion and attraction, create well-paying jobs for its residents, and generate revenues for necessary state and local governmental services.

To better explain the steps, above is an example of tax incentive statutory goals. The goals here are to promote the creation of new jobs, attract new business and industry, and stimulate growth in businesses that would make investments and foster job creation in Rhode Island. And through the

establishment of a jobs incentive program, Rhode Island can take steps to stimulate business expansion and attraction, create well-paying jobs, and generate revenue for the state. The program is largely focused on creating well-paying jobs that would generate tax revenue for the state.



In the next step, we would request data on the jobs created by the incentive's recipient companies, the jobs associated with this tax incentive, and the wages paid to these employees (as noted above). We would then try to determine the NAICS industry that best describes the underlying activity of each recipient company.

Benefits of the Tax Incentive Example



- Step 3: the following REMI policy variables are used:
 - "Industry Employment (Exogenous Production)": assumes employees of the program's beneficiary firms represent net new jobs to the state economy because these jobs are related to exogeneous sources of demand and the employment loss/gain will not be offset by local firms.
 - "Compensation": considers that employees in individual firms may have a different compensation rate than REMI's calculated industry average. These variables are used to adjust the compensation associated with exogenous employment changes without changing the compensation rate for all employees within a given industry.
 - Specific NAICS industries are selected to make employment and compensation changes.

And in step three, once we have all this data, we run the analysis in the REMI model, where we would "shock" the industry employments and our compensation in each of the identified NAICS sectors.

Cost-Benefit Analysis



Analysis Challenges

- The extent to which an incentive actually stimulated new economic activity rather than subsidized economic activity that would have been present in the absence of the tax incentive.
 - Some tax incentives have been established for many years, therefore the historical data presumably reflects the longstanding impact of these tax incentives.
 - The interaction of tax incentives awarded over multiple years and firms receiving multiple tax incentives simultaneously.

Now that we have covered the cost side and the benefits side of this analysis, there are some challenges that need to be addressed. One fundamental challenge is determining how much economic activity can be attributed to the tax incentive. On the one hand, the availability of a tax incentive might have a decisive influence on a firm's location decision. In this case, it might be appropriate for an evaluator to attribute all of the firm's economic activity to the incentive. On the other hand, an incentive program may simply reward or subsidize behavior that likely would have occurred anyway. Additionally, some taxincentives have been around for many years, so the data we collect from their recipient companies reflects the longstanding impact of these tax incentives.

Additionally, when firms receive multiple tax incentives simultaneously, it becomes difficult to determine how much economic activity was generated as a result of these incentives. Because the truepercentage of economic activity taking place in the state due to the tax incentive—versus how much would take place regardless of the tax incentive—is unknown, we conduct a breakeven cost-benefit analysis.

Breakeven Cost-Benefit Analysis



The way we model the costs and benefits are the same as we discussed before. But now, with respect to benefits, instead of using all employment and compensation associated with the tax incentive recipients, we look only at the portion of economic activity that is necessary for the program to break even in terms of general revenues. In other words, the breakeven point is where the total benefits of the program equal its total costs.

Breakeven Cost-Benefit Analysis



Advantages:

- Allows for the evaluation of an incentive program's performance under a wide range of assumptions regarding the level of economic activity that would have taken place if the program had not been available.
- Specifies the proportion of economic activity associated with the incentive program recipients that is assumed to have been attributable to the incentive program in order for the total benefits to equal its total costs.
- Different metrics could be used to conduct a breakeven cost benefit analysis.

The advantage of this approach is it allows for the evaluation of an incentive program's performance, and there are different assumptions regarding the level of economic activity that would have taken place if the program had not been available. You can also specify the portion of economic activity thatone must assume was caused by the incentive program for the program to pay for itself. And one can look at a breakeven point using different metrics. For example, in our reports we check if the programbeing analyzed pays for itself from a general revenue perspective, but we also look at a breakeven percentage in terms of state employment and state gross domestic product (GDP).

The breakeven percentage should be interpreted as follows: If one believes that at least the amount of economic activity implied by the breakeven percentage can be attributed to the availability of the tax incentive, we can infer that the incentive had a net positive impact on state general revenue. And the same for the opposite: If one believes that the amount of economic activity associated with the tax incentive was less than the level implied by the breakeven percentage, one can infer that the incentive had a negative impact on state general revenue. Holding other factors equal, a lower breakeven percentage is more desirable than a higher breakeven percentage if the goal of an incentive program isto cost the state as little revenue as possible.

Also, a tax incentive program can fail to break even when the breakeven percentage is greater than 100%, which basically implies that even if 100% of the economic activity associated with the incentive recipients was assumed to have taken place strictly because of the incentives, net negative impacts on state general revenue would have resulted.





When we conduct the breakeven analysis for any tax incentive program, these are the typical steps we take. In step one, we input direct benefits as policy variables simulating changes in industry sales, exogenous final demand, employment, and compensation. Simultaneously, we input costs as a reduction in state government spending. At the end, we examine a wide range of assumptions regarding the level of economic activity that resulted from the tax incentive program.

Demonstration: Motion Picture Production Tax Credit Evaluation

Motion Picture Production Tax Credits (MPPTC)



- A tax credit in an amount of 30% of the state-certified production costs incurred directly attributable to activity within the state.
- The amount of credit allowed for any single production is capped at \$7,000,000.
- The total amount of credits issued in a given year shall not exceed \$20,000,000 for both motion pictures and musical and theatrical productions.
- No employment or wage criteria need to be met by the motion picture production company in order to qualify for the credit.

Emily Fazio, RI ORA

Let's first look at the <u>Motion Picture Production Tax Credit program</u>, which allows a tax credit in the amount of 30% of the state-certified production costs directly attributable to activity within the state. For production expenses to be eligible, the primary locations must be in Rhode Island and the production must incur and pay a minimum of \$10 million in state-certified production costs within a 12-month period. The total credit amount cannot exceed \$7 million and earned credits can be carried forward for up to three years. There are no employment or wage criteria needed to receive this tax credit. It's all about spending.

Motion Picture Production Tax Credits (MPPTC)



- Incentive objectives are:
 - attract private investment and develop tax infrastructure to encourage private investment using tax credits;
 - >encourage increased employment opportunities within this sector.
- The MPPTC amount issued by Taxation was modeled as the cost of the tax incentive.
- Benefits of the MPPTC include:
 - >spending by recipient firms at local vendors;
 - >direct wages paid to recipient firms' employees (excluding above-the-line personnel).

The primary objective of the tax credit outlined in the statute is to encourage development of a strong capital base for motion picture and other productions in Rhode Island, and to achieve a more independent and self-supporting industry. The tax credit is used to attract private investment in motion picture production. In order to do a cost-benefit analysis on this program, we use the MPPTC amount issued by the Division of Taxation to model the cost of the incentive, and use spending by recipient firms and the direct wages paid to their employees as the benefit. We were able to review certified production expenses and employee information and categorize expenses into a set of policy variables that we could then use with the REMI model.

REMI Demonstration and Data Analysis*

In the table below, we show a breakdown of \$1.4 million in qualified production expenses by the NAICS industries to which we mapped the spending. Since this breakdown reflects actual production spending, we use this to update the input-output table in REMI so that the benefits we input will show a model impact that better reflects real spending. REMI's standard industry assumptions in its input-output table are based on BEA data. It imposes that \$1 of spending of motion picture and sound recording industry output consists of 24 cents of intermediate inputs, 23 cents of labor, and 52 cents of capital investment.In comparison, for the production spending on tax credit recipient projects, \$1 of certified spending consists of 3 cents of intermediate inputs, 9 cents of capital investment, and 88 cents of labor. I will talk a bit more about the spending and inputs below. But now we are going to look at the Excel spreadsheet where we organize all of our input and output data:

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| [[·]] | 1 | | | Mo | deling Costs | Baseline |
| - | 2 | | | Policy Variable | Industry | 100% |
| | 3 | | | State & Local Government Spending | State Government | -\$361,796 |
| | 5 6 | Credit Amount | \$361,796 | Mode | eling Benefits | Baseline |
| | 7 | Compensation Assumptions | | Policy Variable | Industry | 100% |
| | 8 | Motion Picture and Sound Recording Industry: Compensation | \$1,254,328 | Industry Sales (nullifying employment and investment) | Motion Picture and Sound Recording | \$1,431,786 |
| × | 9 | % Assumption Above the Line (EXCLUDE) | 65% | Nullify Intermediate Inputs | Motion Picture and Sound Recording | \$1,431,786 |
| 14 | 10 | % Assumption Below the Line (INCLUDE) | 35% | Compensation | Motion Picture and Sound Recording | \$439,015 |
| - 2 | 11 | Amount Assumed Above the Line (EXCLUDE) | \$815,313 | Industry Sales / Exogenous Production | Accommodation | \$9,410 |
| 10 | 12 | Amount Assumed Below the Line (INCLUDE) | \$439,015 | Industry Sales / Exogenous Production | Food services and drinking places | \$18,803 |
| 1.1 | 13 | | | Industry Sales / Exogenous Production | Professional, scientific, and technical services | \$856 |
| | 14 | | | Industry Sales / Exogenous Production | Real estate | \$4,005 |
| 4 | 15 | | | Industry Sales / Exogenous Production | Rental and leasing services; Lessors of nonfinancial intangible assets | \$128,261 |
| | 16 | | | Industry Sales / Exogenous Production | Transit and around passenger transportation | \$2.155 |
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At the top of this spreadsheet, we have the cost, which is equal to the total credit amount issued, and below we have the benefits. In column A, you can see an additional assumption we have to make about the production compensation. We want to adjust the data to try to account for spending that simply flows out of state, so we made an adjustment to the wages paid to highly compensated out-of-state employees, referred to as "above-the-line" individuals. In film production, "above the line" personnel generally refer to screenwriters, producers, directors, and main actors.

We excluded all above-the-line compensation from the cost-benefit analysis and included only "belowthe-line" compensation. From this, we found that 65% of total compensation went to above-the-line personnel. And would not have any significant indirect or induced effects on the Rhode Island economy (other than that generated from personal income taxes paid). Therefore, we exclude 65% of the total compensation and keep the remaining 35%, which is entered into the REMI model as an increase in compensation in the motion picture and sound recording industry.

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| 1 | Moc | leling Costs | Baseline | | | | | |
| 2 | Policy Variable | Industry | 100% | | | | | |
| 3 | State & Local Government Spending | State Government | -\$361,796 | | | | | |
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| 7 | Policy Variable | Industry | 100% | | | 28. | | Ļ |
| 8 | Industry Sales (nullifying employment and investment) | Motion Picture and Sound Recording | \$1,431,786 | | | | | |
| 9 | Nullify Intermediate Inputs | Motion Picture and Sound Recording | \$1,431,786 | | | | | |
| 10 | Compensation | Motion Picture and Sound Recording | \$439,015 | | | | | |
| 11 | Industry Sales / Exogenous Production | Accopynodation | \$9,410 | | | | | |
| 12 | Industry Sales / Exogenous Production | Food services and drinking places | \$18,803 | | | | | |
| 13 | Industry Sales / Exogenous Production | Professional, scientific, and technical services | \$856 | | | | | |
| 14 | Industry Sales / Exogenous Production | Real estate | \$4,005 | | | | | |
| 15 | Industry Sales / Exogenous Production | Rental and leasing services; Lessors of nonfinancial intangible assets | \$128,261 | | | | | |
| 16 | Industry Sales / Exogenous Production | Transit and around passenger transportation | \$2 155 | | | | | ļ |
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In addition, on our previous slide I showed you the breakdown of spending by NAICS industry totaling \$1.4 million. That total spending is entered into REMI as industry sales. Since we know the actual breakdown of industry sales, instead of letting REMI use its default settings to distribute that spending

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| | 2 | Policy Variable | Industry | 100% | 100% | 100% | 100% | 100% | |
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| | 5 | | | | | | | | |
| - | 6 | Mode | ling Benefits | Run #1 | Run #2 | Run #3 | Run #4 | Run #5 | F |
| | 7 | Policy Variable | Industry | 90% | 80% | 70% | 60% | 50% | |
| | 8 | Industry Sales (nullifying employment and investment) | Motion Picture and Sound Recording | \$1,288,607 | \$1,145,429 | \$1,002,250 | \$859,072 | \$715,893 | |
| | 9 | Nullify Intermediate Inputs | Motion Picture and Sound Recording | \$1,288,607 | \$1,145,429 | \$1,002,250 | \$859,072 | \$715,893 | |
| | 10 | Compensation | Motion Picture and Sound Recording | \$395,113 | \$351,212 | \$307,310 | \$263,409 | \$219,507 | |
| | 11 | Industry Sales / Exogenous Production | Accommodation | \$2,469 | \$7,528 | \$6,587 | \$5,646 | \$4,705 | |
| 1.0 | 12 | Industry Sales / Exogenous Production | Food services and drinking places | \$16,922 | \$15,042 | \$13,162 | \$11,282 | \$9,401 | |
| | 13 | Industry Sales / Exogenous Production | Professional, scientific, and technical services | \$770 | \$685 | \$599 | \$514 | \$428 | |
| | 14 | Industry Sales / Exogenous Production | Real estate | \$3,605 | \$3,204 | \$2,804 | \$2,403 | \$2,003 | |
| × . | 15 | Industry Sales / Exogenous Production | Rental and leasing services; Lessors of nonfinancial intangible assets | \$115,435 | \$102,609 | \$89,783 | \$76,957 | \$64,131 | |
| | 16 | Industry Sales / Exogenous Production | Transit and around passenger transportation | \$1 030 | \$1 724 | \$1 508 | \$1 203 | \$1.077 | |
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across industries, we nullify the <u>intermediate inputs</u> and enter the actual industry sales by NAICS industry, which is what we have in the spreadsheet above. This is the actual spending breakdown. Now,once we have established these inputs, this completes what we call the 100% scenario, in which we assume all the economic activity is relevant, in this case represented by industry spending and compensation. All of this economic activity occurred *because of* the availability of the Motion Picture Production Tax Credit. From here, we can now evaluate the incentive under additional scenarios, wherewe reduce the economic activity associated with the availability of the incentive.

It is important to note that the cost of the incentive does not change. Under every scenario, the cost of the incentive is still the total amount of incentive received. No matter how much economic activity was spurred by the incentive, the state still paid the same amount. For example, in the 80% scenario shown above, we assume that 80% of the economic activity occurred because of the availability of the tax credit. Row 8 shows industry sales, and it's 80% of that \$1.4 million. And as you can see, the costs remain the same: \$361,000. And so we will rerun these scenarios, changing the benefit inputs, reducingthem all the way down to 0%, where we assume that none of the economic activity that resulted from the tax credit, meaning it would have occurred in exactly the same way without the incentive. But obviously, the state did pay an incentive. Next, I will walk through a REMI demonstration of how we putthis into the model (below).



This is a REMI interface. I'll show you an example of how we would input our changes into the model. First, we go to our input list. Here is the whole list of policy variables that you can choose. They have definitions and some information about them. But often what we do when we start a new evaluation is talk to REMI to make sure that the variable we're choosing is doing what we think it's doing, that it has the right model connections, and that there isn't a better policy variable we could be using.

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* Note: The software discussed and screenshots are from the software owned and provided by RegionalEconomic Models, Inc.

What we are using here is industry sales. I will select exogenous production, and then we will look at the details, connect to the industry. For this, we are looking at the motion picture production and sound recording industries; you choose your region (for our analysis, it's Rhode Island), then you choose the units. I'll use nominal units, added to the editor.

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| E V K Compensation | The second se | | | | | | | | 1 |
| Ac Vier Category | Detail | Region | Units | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| Compensation | Compensation: Motion picture and sound recording industries | Rhode Island | Nominal \$ (Units) | 0 | 439014.65: 0 | | 0 | 0 | 0 |
| C C Industry Sales by NATCS | | | | | 63 | | | | |
| | Datell | Dealer | Linite | 2010 | 2020 | 2021 | 2022 | 2022 | 2024 |
| AC VIE Category AC Industry Sales (Evonencus Production) | Wholesale trade | Region Rhode Island | Nominal \$ (Units) | 0 | 13968 801:0 | 2021 | 0 | 0 | 0 |
| Industry Sales (Evogenous Production) | Transit and ground passenger transportation | Phode Island | Nominal \$ (Lipite) | 0 | 2154 94911 0 | | 0 | 0 | 0 |
| Industry Sales (Exogenous Production) | Paal estate | Phode Island | Nominal & (Units) | 0 | 4005 0350: 0 | | 0 | 0 | 0 |
| Industry Sales (Exogenous Production) | Rental and leasing services: Lessors of pontinancial intangible | Phode Island | Nominal \$ (Units) | 0 | 178261 244 0 | | 0 | 0 | 0 |
| Industry Sales (Exogenous Production) | Professional ecientific and technical earlyice | Phode Island | Nominal & (Unite) | 0 | 955 995001 0 | | 0 | 0 | 0 |
| Industry Sales (Exceptions Production) | Accommodation | Rhode Island | Nominal & (Units) | 0 | 0.400 92076 0 | | 0 | 0 | 0 |
| Industry Sales (Exogenous Production) | Food applicant and dilation alterna | Rhode Island | Nominal & (Units) | 0 | 10003 760' 0 | | 0 | 0 | 0 |
| Industry sales (Exogenous Production) | r vou services and unimity places | KI IOUC ISIDITU | Home S (Offics) | 0 | 10002.7001 0 | | 0 | 0 | |
| + V K Cost of Incentive | | | | | | | | | 2 |
| E V K Government Spending | | | | | | | | | |
| | | | | _ | | | _ | | |
| 12 policy variables active. Saved | | | | Rhode Is | and (Tax-R | RI) - Sin | ale Reaia | n 70 Sec | tor Model |

Now we can edit our values and put \$1.4 million in as our total industry sales for the 100% scenario (where 100% of the activity is attributed to the incentive). And then I would add this variable to my input list, as shown above. This first line is industry sales. We just talked about the \$1.4 million. This is where we nullify those intermediate inputs. And here's where we enter the industry sales by NAICS industry. Then we have our compensation, which is below-the-line compensation.

| Ac Vier Category | Detail | Region | Units | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|-------------------------------------|-------------------|--------------|--------------------|------|------------|------|------|------|------|
| Custom Revenues | cost of incentive | Rhode Island | Nominal \$ (Units) | 0 | -361796.44 | 0 | 0 | 0 | 0 |
| ē] III. | | | | | | | | | 1 |
| C Sovernment Spending | | | | | 3 | | | | |
| Ac Vier Category | Detail | Region | Units | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| State and Local Government Spending | State Government | Rhode Island | Nominal \$ (Units) | 0 | -361796.44 | 0 | 0 | 0 | 0 |
| | | | | | | | | | |

Then we enter our cost of incentive as a reduction in state government spending. We also have a custom revenue variable for the cost of the incentive, reflecting the reduction in revenue available for other spending since it is being spent on this incentive.

| | | | | MPPT | C. | | | | | | | - 🖻 🔛 |
|---|--|--|---|--|--|---|---|--|---|--|---|--|
| | | | | Sel | ect Inputs | | Input | s List | Fore | cast Op | tions | Results |
| udget | | | | | | | | | ¢ | | Callegory Industry | Links Pr2019 Pr2020 is of Current Dollars 0.000 -355668.758 |
| mparison Type | Forecast | Compi | arison Forecast | budget file | <u>_</u> | | | | | | Total Expenditures Indi-du | is of Current Dollars 0.000 -4699,964 |
| Category otal Revenues otal Emenditures | Units Individuals of Current Dollars Individuals of Current Dollars | FY2019 0.000 0.000 | FY2020 -355668.758 -4989.964 | FY2021 -1731.073 -3773.646 | FY2022 -1466.409 -2936.709 | FY2023 -1438.651 -2456.691 | FY2024 -1360.140 -2115.562 | FY2025 -1265.271 -1930.487 | FY2026 -1152.826 -1684.634 | | The second | Budget |
| | | | | | | | | | | | Romans | Budget |
| | | | | | | | | | | | Income Tax (RI Residents): I Income Tax (RI Residents): Income Tax (RI Residents) Income Tax (RI Non Resident Income Tax (RI Non Resident Income Tax (RI Non Resident Income Tax (RI Non Resident | To Lease To Devise and Course to Delay Ha Lubb To Devision of Course to Delay Ha Lubb To Devision of Course to Delay Ha Lubb Table Devised and Course to Delay 127,731 (a) (b) Devision of Course to Delay 127,731 (c) (b) Devision of Course to Delay 157 (c) (c) (c) Devision of Course to Delay |
| | udget parison Type rences V Category Tal Revenues tal C enditures | udget parison Type Forecast rences MPPTC Category Units Tal Revenues Individuals of Current Dollars Individuals of Current Dollars | udget parison Type Forecast Comp rences V MPPTC V Region Category Units Pr2019 Tal Revenues Individuals of Current Dollars 0.000 Lat e endhures Individuals of Current Dollars 0.000 | udget parison Type Forecast Comparison Forecast rences V MPPTC V Regional Control_with Category Units PY2019 PY2020 tal Revenues Individuals of Current Dollars 0.000 -355668.758 tal Penditures Individuals of Current Dollars 0.000 -4989.964 | udget parison Type Forecast rences V MPPTC Category Units Fr2019 Fr2019 Total Revenues Individuals of Current Dollars 0.000 -355668.758 Individuals of Current Dollars 0.000 V -4989.964 -3773.646 | udget parison Type Forecast rences MPPTC Category Units Pr2019 Pr2020 Tolked of Current Dollars 0.000 | Select Inputs udget parison Type Forecast rences V MPPTC V Regional Control_with budget file Category Units PY2019 PY2020 PY2021 PY2022 FY2023 tal Revenues Individuals of Current Dollars 0.000 -355568.758 -1731.073 -1466.409 -1438.651 tal Christianes Individuals of Current Dollars 0.000 -4989.964 -3773.646 -2936.709 -2456.691 | Select Inputs Inputs udget | Select Inputs Inputs List udget | Select Inputs Inputs List Fore | Select Inputs Inputs int Forcas of participant participant | Select Inputs Inputs List TorcastOptions udget <t< td=""></t<> |

We then run the forecast. Above is the first page, showing total revenues and expenditures. The table shows the difference between the scenario you created with those model inputs and a regional control without those inputs.

| -PI | Revenues | | | | | | | | | Category Links #12039 Total Revenues End-iduals of Carrent Dollars 0.000 |
|---------------------|--------------------------------------|--------------------------------------|-------------|----------------|------------|----------|----------|----------|------|---|
| udget | Category Comparison Type | Forecast | Comparison | Forecast | | | | | | Total Expenditures Individuals of Current Dolars 0.000 |
| | Revenues 🗹 Differences 🗹 | MPPTC (| Regional Co | ntrol_with bud | get file 🖂 | | | | | |
| | Revenues | Units | FY2019 | FY2020 | FY2021 | FY2022 | FY2023 | FY2024 | FY2^ | |
| | Income Tax (RI Residents): \$0 or Le | ss Individuals of Current Dollars | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | |
| | Income Tax (RI Residents): \$1-\$61, | 300 Individuals of Current Dollars | 0.000 | +175.465 | -19.952 | -20.124 | -22.977 | -23.135 | - | 1203 |
| | Income Tax (RI Residents): \$61,301 | -\$13 Individuals of Current Dollars | 0.000 | +546.791 | -62.177 | -62.712 | -71.602 | -72.096 | - | Budget |
| | Income Tax (RI Residents): \$139,40 | 1-\$1 Individuals of Current Dollars | 0.000 | +273.946 | -31.151 | -31.419 | -35.873 | -36.120 | - | |
| | Income Tax (RI Residents): \$195,15 | 1-\$2 Individuals of Current Dollars | 0.000 | +77.459 | -8.808 | -8.884 | -10.143 | -10.213 | | |
| | Income Tax (RI Residents): \$217,35 | 1 or Individuals of Current Dollars | 0.000 | +857.964 | -97.561 | -98.401 | -112.350 | -113.124 | -1 | |
| | Income Tax (RI Non Residents): \$0 o | r Le Individuals of Current Dollars | 0.000 | +0.239 | -0.027 | -0.027 | -0.031 | -0.032 | - | |
| | Income Tax (RI Non Residents): \$1- | \$61, Individuals of Current Dollars | 0.000 | +26.733 | -3.040 | -3.066 | -3.501 | -3.525 | | 2 |
| | Income Tax (RI Non Residents): \$61 | ,301 Individuals of Current Dollars | 0.000 | +85.072 | -9.674 | -9.757 | -11.140 | -11.217 | - | |
| | Income Tax (RI Non Residents): \$13 | 9,40 Individuals of Current Dollars | 0.000 | +56.691 | -6.446 | -6.502 | -7.424 | -7.475 | | |
| av-PT | Income Tax (RI Non Residents): \$19 | 5, 15 Individuals of Current Dollars | 0.000 | +19.379 | -2.204 | -2.223 | -2.538 | -2.555 | | |
| UA 14 | Income Tax (RI Non Residents): \$21 | 7,35 Individuals of Current Dollars | 0.000 | +252.968 | -28.765 | -29.013 | -33.126 | -33.354 | - | լիդ |
| | Business Corporations | Individuals of Current Dollars | 0.000 | +2683.672 | -2.910 | -15.848 | -27.539 | -31.079 | - | Dudent |
| napshots | Financial Institutions | Individuals of Current Dollars | 0.000 | +3.596 | +2.961 | +2.179 | +1.326 | +0.981 | | Budget |
| | Bank Deposits | Individuals of Current Dollars | 0.000 | +1.498 | +0.038 | +0.022 | -0.001 | 0.000 | | |
| nalytics | Health Care Provider Assessment | Individuals of Current Dollars | 0.000 | +48.212 | -1.244 | -1.876 | -3.891 | -4.805 | | Revenues Units |
| | Sales and Use Tax: Meal and Bevera | ge () Individuals of Current Dollars | 0.000 | +140.523 | -79.458 | -66.190 | -64.670 | -61.887 | - | Income Tax (RI Residents): 50 or Less Individuals of Current Do Income Tax (RI Residents): 51-661,300 Individuals of Current Do |
| etailed Economic | Sales and Use Tax: Hotel | Individuals of Current Dollars | 0.000 | +31.302 | -9.072 | -7.725 | -10.714 | -14.103 | | Income Tax (RI Residents): 851,301-511 Individuals of Current Do |
| | Sales and Use Tax: Marijuna (MJ) | Individuals of Current Dollars | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | Income Tax (RI Residents): \$155,151-55 Individuals of Current Do |
| etailed Demographic | Sales and Use Tax: Net Taxation and | PPI Individuals of Current Dollars | 0.000 | +1683.579 | -178.710 | -167.920 | -208.339 | -218.477 | -2 | Income Tax (RI Residents): \$217,351 or [Individuals of Current Do Income Tax (RI Non Residents): \$0 or Le Individuals of Current Do |
| grupine | Sales and Use Tax: Registry - Motor | Vehi Individuals of Current Dollars | 0.000 | +390.577 | -2.607 | -9.087 | -19.954 | -23.161 | | Income Tax (RI Non Residents): \$1-56 L Individuals of Current Da Income Tax (RI Non Residents): \$51,751 Individuals of Current Da |
| | Sales and Use Tax: Compassion Cen | ter 5 Individuals of Current Dollars | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | Income Tax (RI Non Kesidents): \$130,4C Individuals of Current Do |
| avonues | | | | | | | | | | |
| Menu Settings 🚳 | | | | | | | | | | Revenues |

We can also look at our detailed budget (above) and the changes that happened to our revenues.

| S Bernards | Linportait | | | | | | | | | | + | _ | Revenues Income Tax (RI Residents): \$2 or Less | Units Individuals of Current Dollar |
|------------------------|------------------|-------------------------|--------------------------------|--------|---------------|-------------|-----------|-----------|----------|----------|---------|-------|---|--|
| Economic Summary | Category | Comparison Type | Forecast | Cor | nparison Fore | cast | | | | | | -Ba | Income Tax (RJ Residents): \$1-\$61,30 Income Tax (RJ Residents): \$51,301-5 | 0 Individuals of Current Dollar 1 ¹ Individuals of Current Dollar |
| Overview | Expenditures 🗠 | Differences | MPPTC | 🖂 Reg | ional Control | with budget | file 🖂 | | | | | | Income Tax (RI Residents): \$139,401- | 81 Induiduals of Current Dolla |
| Employment | Ex | penditures | Units | FY2019 | FY2020 | FY2021 | FY2022 | FY2023 | FY2024 | FY2025 | FY2026 | 1 | Income Tax (RI Residents): \$217,351 (Income Tax (RI Non Residents): \$0 or (| er Individuals of Current Dollar |
| Gross Domestic Product | Behavioral Hea | Ith and State Hospitals | Individuals of Current Dollars | 0.000 | -314.745 | -230.403 | -175.954 | -143.846 | -121.880 | -105.477 | -92.3: | | Income Tax (RI Non Residents): \$1-\$6 | 1. Individuals of Current Dollar |
| ncome | Children Youth | and Families | Individuals of Current Dollars | 0.000 | -105.857 | -77.483 | -60.061 | -50.371 | -43.380 | -38.154 | -33.88 | 15:03 | Income Tax (RJ Non Residents): \$139, | < Individuals of Current Dollar |
| | Corrections | | Individuals of Current Dollars | 0.000 | -35.489 | -25.487 | -18.889 | -14.528 | -11.404 | -9.055 | -7.21 | | | |
| | Courts | | Individuals of Current Dollars | 0.000 | -31.844 | -23.311 | -17.802 | -14.553 | -12.331 | -10.671 | -9.34 | | Reve | nues |
| emographic | Economic Deve | lopment | Individuals of Current Dollars | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 | | | |
| | Elected Official | s | Individuals of Current Dollars | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 | | IT | |
| | Environment | | Individuals of Current Dollars | 0.000 | +127.371 | +1.267 | -0.408 | -1.664 | -2.144 | -2.211 | -2.04 | | | |
| | General Govern | nment | Individuals of Current Dollars | 0.000 | -110.779 | -81.094 | -61.929 | -50,629 | -42.897 | -37.124 | -32,45 | 2 | | |
| | Health and Hun | nan Services | Individuals of Current Dollars | 0.000 | -125.786 | -92.079 | -70.319 | -57.487 | -48.709 | -42.153 | -36.85 | 4 | | |
| | Health Services | 5 | Individuals of Current Dollars | 0.000 | -1269.096 | -942.123 | -731.994 | -606.189 | -519.938 | -456,506 | -404.7. | | 18 | |
| Tax-PI | Higher Education | n | Individuals of Current Dollars | 0.000 | -57.671 | -41.419 | -30.695 | -23.610 | -18.533 | -14.715 | -11.7: | | it a | |
| | Other | | Individuals of Current Dollars | 0.000 | -6.504 | -4.761 | -3.636 | -2.972 | -2.519 | -2.180 | -1.90 | | | |
| Snanshots | Public Education | n | Individuals of Current Dollars | 0.000 | -2083.905 | -1545.173 | -1225.698 | -1053.740 | -923.982 | -896.303 | -777.4; | | terfore for the first for the | |
| Shapshoes | Public Safety | | Individuals of Current Dollars | 0.000 | -21.600 | -15.812 | -12.075 | -9.872 | -8.364 | -7.239 | -6.33 | | Reve | nues |
| | RICAP | | Individuals of Current Dollars | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 | | | |
| Analytics | Transportation | | Individuals of Current Dollars | 0.000 | -644.568 | -469.210 | -354.232 | -285.786 | -239.636 | -204.984 | -177.45 | | Expenditures | Units |
| Detailed Economic | Local Governme | ent Spending | Individuals of Current Dollars | 0.000 | -309.491 | -226.557 | -173.017 | -141.445 | -119,845 | -103.716 | -90,7; | | Behavioral Health and State Hospitals Children Youth and Families Corrections Courts | Individuals of Current Dollars Individuals of Current Dollars Individuals of Current Dollars Individuals of Current Dollars |
| Detailed Demographic | | | | | | | | | | | | | Economic Development Elected Officials Environment General Government Health and Human Services | Individuals of Current Dollars Individuals of Current Dollars Individuals of Current Dollars Individuals of Current Dollars Individuals of Current Dollars |
| avorites | < | 10 | | | | | | | | | | | Health Services | Individuals of Current Dollars |
| Menu Settings (2) | | | | | | | | | | | | | Expend | ditures |

And you can view expenditures and all sorts of output in different ways, then look at your economic variables, as shown below.

| 8 | | | MPI | РТС | | | | | | | | |
|---|---|---|---|--|---|---|--|---|--|----------|--|---|
| Save Forecast Selection Results | | | S | elect Inp | uts | | Inputs Li | st | Fore | cast Op | otions | Results |
| Search Result Tables Q 🗙 Snapshots Economic Summary | Summary Comparison Type Forecast Differences V METC | Comparison Fore | ast | | | | | | ¢ | | Category Total Employment Private Nan Amato Employment Residence Adjusted Employment Population Labor Proce | Unb Thusants (Data) Thusants (Data) Thusants Thusants |
| Employment Gross Domestic Product | Category Total Employment | Units Thousands (Johs) | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | | Gross Domestic Product Output Value-Added Personal Income | Billions of Fixed (2012) Dokers Billions of Fixed (2012) Dokers Billions of Fixed (2012) Dokers Billions of Current Dokers |
| Income Production and Trade Demographic | Private Non-Farm Employment Residence Adjusted Employment Population Labor Force Gross Domeet Improduct Output Value-Added Personal Income | Thousands (bbs) Thousands Thousands Thousands Billions of Fixed (2012) Dollars Billions of Fixed (2012) Dollars Billions of Current Dollars | 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 | +0.001 +0.003 -0.001 -0.001 +0.001 +0.001 +0.001 +0.001 | +0.000 +0.000 -0.001 -0.001 +0.000 +0.000 +0.000 0.000 | 0.000 0.000 -0.001 0.000 0.000 0.000 0.000 0.000 | 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 | 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 | 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 | | Depender Personal Income | Johns of Correct Dales |
| Tax-PI | Real Disposable Personal Income Real Disposable Personal Income per Car | Billions of Fixed (2012) Dollars Thousands of Fixed (2012) Dollars | 0.000 | +0.000 +0.000 | 0.000 +0.000 | 0.000 | 0.000 +0.000 | 0.000 | 0.000 | | | |
| Snapshots | PCE-Price Index | 2012=100 (Nation) | 0.000 | 0.000 | +0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | Employment | and Population |
| Analytics | | | | | | | | | | | | |
| Detailed Economic | | | | | | | | | | | | |
| Favorites | < " | | | | | | | | > | | GDP an | d Output |
| Menu Settings (3) 12 policy variables active. Sa | ived | | | | | | | | Rhode I: | sland (T | ax-RI) - Single Re | gion 70 Sector Mode |

From here you can look at the impact on total employment, on GDP, income, and similar variables. There is a lot more in this model, but those are the main ones we look at. We usually take the

information we are interested in, pull it out of REMI, and put it into our spreadsheet so that it's organized and easy to look at.

| AutoSav | e 💽 🗄 り・ 🤉 | - ⇒ MPPTC Analysis | Example - Excel 🔎 Search | | | | Fazio, Emil | y (DOR) 🕫 🗄 | |
|-----------|------------------------------|---|----------------------------|-------------------------------|-------------------------------------|-----------------------------|---------------|--|-------------------------------|
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| + | 18 | | | | | | | | |
| | 19 | N | Aodel Output | ¢ | 100% | 90% | 80% | 70% | 60% |
| 4 | 20 | | Employment | | 1 | 0 | (0) | (1) | (1) |
| | 21 | | GDP (\$000) | | \$568 | \$456 | \$345 | \$233 | \$121 |
| | 22 | | Total Net Revenues (\$000) | , | -\$356.3 | -\$359.1 | -\$361.9 | -\$364.7 | -\$367.4 |
| | 23 | | Personal Incom | e Tax | \$2.1 | \$1.1 | \$0.0 | -\$1.0 | -\$2.1 |
| | 24 | | General Busines | s Taxes | \$3.1 | \$2.6 | \$2.0 | \$1.5 | \$0.9 |
| | 25 | | Sales and Use 7 | faxes | \$1.7 | \$0.7 | -\$0.3 | -\$1.3 | -\$2.4 |
| | 26 | | Other Taxe | łs | \$0.1 | \$0.0 | \$0.0 | -\$0.1 | -\$0.1 |
| | 27 | | Total Departmenta' | Receipts | -\$0.9 | -\$0.9 | -\$1.0 | -\$1.1 | -\$1.1 |
| | 28 | | Other Source | :es | -\$0.7 | -\$0.7 | -\$0.8 | -\$0.8 | -\$0.9 |
| | 20 | | Charle | | \$261 706 | \$261 706 | \$361 706 | \$361 706 | -\$361 706 |
| | 29 | | Check | | -3301.790 | -3301.790 | -3301.790 | -3501.750 | -0001.700 |

This is our output. We will run the scenarios through REMI and get output for each scenario, then show the resulting changes in employment, GDP, and total revenue. We also look at the major revenue components. We use this data to construct our breakeven charts, which are illustrated below.



Taking the output from our REMI model, we construct breakeven charts for the relevant categories. Theone above is for general revenue. Notice that as the percentage of benefits in the breakeven analysis increases, the revenue impact increases, but it never exceeds zero.

Therefore, it can be said that the Motion Picture Production Tax Credit program "fails to break even." Even under the assumption that 100% of the activity associated with the tax credit recipient productions was net new to the state, the net impact on state general revenue is still negative. The breakeven framework can also be extended to employment and GDP. In these contexts, the breakeven percentagecan be interpreted as the percentage of economic activity associated with tax credit recipient firms that must be assumed to be attributable to the availability of the tax credit, in order for the increase in employment or GDP resulting from that new economic activity to outweigh the employment or GDP losses resulting from the reduction in government spending that was necessary to fund the credit.



The chart above has the results of the breakeven analysis with respect to employment. It shows the estimated new employment results for each scenario. These results indicate that under the best-case scenario, if 100% of economic activity associated with the tax credit is attributable to the availability of the tax incentive, there is an estimated net gain of one job. Under the worst-case scenario, if the economic activity would have taken place regardless of the availability of the tax credit, the estimated net loss is three jobs across the state economy.

The breakeven point (where job losses from forgone state government spending are offset by job gains due to the tax incentive) is when about 80% of economic activity generated by companies receiving motion picture and production tax credits is caused by the incentive.

In other words, the employment breakeven percentage of 80% implies that the Motion Picture Production Tax Credit has a net positive impact on Rhode Island employment if at least 80% of economicactivity associated with the tax credit recipient productions would not have occurred but for the availability of the tax credit.



The chart above shows the estimated GDP results for different scenarios. These results indicate that under the best-case (100%) scenario, there is a net gain of \$567,000 in Rhode Island GDP. Under the worst-case scenario, if the production activity would have taken place regardless of the availability of the tax credit, the estimated net loss is \$548,000 across the whole state economy.

The breakeven point where GDP losses from forgone state government spending are offset by GDP gains due to the tax incentive is when 49% of economic activity generated by firms receiving the tax credit is caused by the tax incentive.

The fact that the Motion Picture Production Tax Credit breaks even with respect to employment and GDP, but not with respect to state general revenue, means that it's possible for the program to have a net positive impact on employment and GDP while still not generating sufficient revenue to pay for itself. But the statute requires us to look at the impact on general revenue, which is why our first metricis always state general revenue.

Motion Picture Production Tax Credits (MPPTC)



| Dea | neu Net Econ | omic & Rev | enuermpact | 2 | | |
|---|--------------|------------|---------------|----------------|------------|-----------|
| | | Р | olicy Variabl | e Percentage A | Assumed | |
| | 0% | 20% | 40% | 60% | 80% | 100% |
| | | Eco | nomic & Rev | enue Impacts | Calculated | |
| Total Employment (Count) | -3 | -3 | -2 | -1 | 0 | 1 |
| Total GDP (\$000) | \$(548.4) | \$(325.1) | \$(101.9) | \$121.3 | \$344.6 | \$567.8 |
| Generated Revenues by Component (\$000) | | | | | | |
| Personal Income Tax | \$(8.4) | \$(6.3) | \$(4.2) | \$(2.1) | \$0.0 | \$2.1 |
| General Business Taxes | \$(2.4) | \$(1.3) | \$(0.2) | \$0.9 | \$2.0 | \$3.1 |
| Sales and Use Taxes | \$(8.5) | \$(6.5) | \$(4.4) | \$(2.4) | \$(0.3) | \$1.7 |
| Other Taxes | \$(0.4) | \$(0.3) | \$(0.2) | \$(0.1) | \$0.0 | \$0.1 |
| Total Departmental Receipts | \$(1.5) | \$(1.4) | \$(1.2) | \$(1.1) | \$(1.0) | \$(0.9) |
| Other Sources | \$(1.2) | \$(1.1) | \$(1.0) | \$(0.9) | \$(0.8) | \$(0.7) |
| Cost of Incentive (\$000) | \$(361.8) | \$(361.8) | \$(361.8) | \$(361.8) | \$(361.8) | \$(361.8) |
| | \$(204.2) | \$(378.6) | \$(373.0) | \$(367.4) | \$(361.9) | \$(356.3) |

This table provides a detailed summary of results across each scenario. We show total employment for every scenario, and total GDP, and we break down general revenues by their major components. At the bottom we have the total net revenue generated under each scenario. The total net revenue is negative across all scenarios. Under the 100% scenario, the state gives about \$361,000 in incentives and receives about \$5,500 in new revenue, which is the sum of the components of revenue.

To express this another way, we can calculate the payback ratio, which is the ratio of total new revenueto the cost of incentive. This ratio shows that for every \$1 spent on motion picture production tax credits, the state generates about 2 cents in new revenue. New revenue generated from incentivized activity may help offset the cost of the program, but it's not enough for the tax credit to pay for itself.

Demonstration: New Qualified Jobs Incentive Act Evaluation



Next, we're going to look at the <u>New Qualified Jobs Incentive</u> Act. This program grants tax credits to qualified businesses for each new full-time job they create. Each of these full-time employees must workat least 35 hours a week and must have wages that are subject to personal income tax withholding. There are minimums for the number of jobs a business must create to be eligible. The credit amount starts at \$2,500 annually per job created but can increase to \$7,500 if a business meets additional criteria, such as being in a preferred industry or community.

REMI Demonstration and Data Analysis*

The incentive objectives are centered around promoting creation and stimulating business expansion and relocation in Rhode Island. Below, we will look at the model inputs for this incentive.



First, we get the total credit usage by industry from taxation. This credit amount represents the totalcost of the program, which we see under Modeling Costs below.

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| [[+] | 6 | | Modeling Co | sts | Baseline | | | | |
| 1.0 | 7 | | Policy Variable | Industry | 100% | | | | |
| | 8 | | State & Local Government Spending | State Government | -\$96,041 | | | | |
| | 9 | | | | | | | | |
| - | 10 | | Modeling Ben | efits | Baseline | | | | |
| | 11 | Data Source | Policy Variable | Industry | 100% | | | | |
| . 5. | 12 | Taxation | Industry Employment (Exogenous Production) | Electrical equipment, appliance, and component manufacturing | 28 | | | | |
| 1.0 | 13 | | Industry Employment (Exogenous Production) | Wholesale Trade | 17 | | | | |
| 3 | 14 | | Avg Program Compensation | Electrical equipment, appliance, and component manufacturing | \$42,176 | | | | |
| 12 | 15 | Toutin | Avg Program Compensation | Wholesale Trade | \$94,502 | | | | |
| | 16 | Taxation | Total Program Compnesation | Electrical equipment, appliance, and component manufacturing | \$1,180,917 | | | | |
| | 17 | | Total Program Compnesation | Wholesale Trade | \$1.606,532 | | | | |
| | 10 | | REMI AVG Annual Compensation | Electrical equipment, appliance, | \$109,814 | | | | - |
| 16. A. | Sh | eet1 + | | 1 4 | | | | | |

We then identify the benefits of the program. Since its goal is to create good-paying jobs for Rhode Islanders, we use the number of jobs created by tax credit recipients by industry and the average compensation. We then use this average compensation to estimate the total compensation added to the economy by newly created jobs. Then we make an adjustment to the REMI default total compensation.

| | Avg Program Compensation | Electrical equipment, appliance, and component manufacturing | \$42,176 |
|-----------|------------------------------|---|-------------|
| Tourstien | Avg Program Compensation | Wholesale Trade | \$94,502 |
| Taxation | Total Program Compnesation | Electrical equipment, appliance, and component manufacturing | \$1,180,917 |
| | Total Program Compnesation | Wholesale Trade | \$1,606,532 |
| | REMI AVG Annual Compensation | Electrical equipment, appliance, and component manufacturing | \$109,814 |
| DEM | REMI AVG Annual Compensation | Wholesale Trade | \$84,287 |
| KEMI | REMI Total Compensation | Electrical equipment, appliance, and component manufacturing | \$3,074,792 |
| | DEMI T-t-1 Commentation | Whalasala Trada | ¢1 423 070 |

As highlighted above, the REMI default average compensation is different from what we know is the true average compensation earned by the jobs that were created. We calculate the total increase in compensation using the REMI default average compensation. We then incorporate total increase in compensation using the average compensation we receive from the Division of Taxation. We take the difference, which is the compensation adjustment, and put it into the REMI model so that the model is impacted appropriately. If we didn't make this adjustment, REMI would use its own average compensation and total compensation and would add too much to new compensation to the electricalequipment manufacturing industry and not enough to the wholesale trade industry.

| Modeling Bene cy Variable | fits Industry | Run #3 70% | Run #4 60% | Run #5 | Run #6 |
|--|--|--|---|---|--|
| cy Variable | Industry | 70% | 60% | 50% | 400 |
| star Employment (Exogenous Production) | | | | 5070 | 40% |
| suy Employment (Exogenous Froduction) | Electrical equipment, appliance, and component manufacturing | 20 | 17 | 14 | 1 |
| stry Employment (Exogenous Production) | Wholesale Trade | 12 | 10 | 9 | |
| Program Compensation | Electrical equipment, appliance, and component manufacturing | \$42.176 | \$42,176 | \$42.176 | \$42.17 |
| Program Compensation | Wholesale Trade | \$94,502 | \$94,502 | \$94,502 | \$94,50 |
| Program Compnesation | Electrical equipment, appliance, and component manufacturing | \$826,642 | \$708,550 | \$590,459 | \$472,36 |
| l Program Compnesation | Wholesale Trade | \$1,124,572 | \$963,919 | \$803,266 | \$642,61 |
| II AVG Annual Compensation | Electrical equipment, appliance, and component manufacturing | \$109.814 | \$109.814 | \$109.814 | \$109.81 |
| II AVG Annual Compensation | Wholesale Trade | \$84,287 | \$84,287 | \$84,287 | \$84,28 |
| II Total Compensation | Electrical equipment, appliance, and component manufacturing | \$2,152,354 | \$1,844,875 | \$1,537,396 | \$1,229,91 |
| II T-+-1 Camanastian | Whalasala Teada | £1 002 01 F | ¢0£0 707 | \$716 140 | \$577 15 |
| | try Employment (Exogenous Production) Program Compensation Program Compensation Program Compnesation I AVG Annual Compensation I AVG Annual Compensation I Total Compensation I Total Compensation | try Employment (Exogenous Production) Wholesale Trade Program Compensation Electrical equipment, appliance, and component manufacturing Program Compensation Wholesale Trade Program Compnesation Electrical equipment, appliance, and component manufacturing Program Compnesation Wholesale Trade I AVG Annual Compensation Electrical equipment, appliance, and component manufacturing I AVG Annual Compensation Wholesale Trade I Total Compensation Wholesale Trade I Total Compensation Electrical equipment, appliance, and component manufacturing I Total Compensation Wholesale Trade | try Employment (Exogenous Production) Wholesale Trade 12 Program Compensation Electrical equipment, appliance, and component manufacturing \$42.176 Program Compensation Wholesale Trade \$94,502 Program Compnesation Electrical equipment, appliance, and component manufacturing \$826,642 Program Compnesation Wholesale Trade \$1,124,572 I AVG Annual Compensation Electrical equipment, appliance, and component manufacturing \$109,814 I AVG Annual Compensation Wholesale Trade \$84,287 I Total Compensation Electrical equipment, appliance, and component manufacturing \$2,152,354 I Total Compensation Wholesale Trade \$2,152,354 | try Employment (Exogenous Production)Wholesale Trade1210Program CompensationElectrical equipment, appliance, and component manufacturing\$42.176\$42.176Program CompensationWholesale Trade\$94,502\$94,502Program CompnesationElectrical equipment, appliance, and component manufacturing\$826,642\$708,550Program CompnesationWholesale Trade\$1,124,572\$963,919I AVG Annual CompensationElectrical equipment, appliance, and component manufacturing\$109.814\$109.814I AVG Annual CompensationWholesale Trade\$84,287\$84,287I Total CompensationElectrical equipment, appliance, and component manufacturing\$2,152,354\$1,844,875I Total CompensationWholesale Trade\$2,152,354\$1,844,875I Total CompensationWholesale Trade\$2,002,015\$250,727 | try Employment (Exogenous Production)Wholesale Trade12109Program CompensationElectrical equipment, appliance, and component manufacturing\$42.176\$42.176\$42.176Program CompensationWholesale Trade\$94,502\$94,502\$94,502Program CompnesationElectrical equipment, appliance, and component manufacturing\$826,642\$708,550\$590,459Program CompnesationWholesale Trade\$1,124,572\$963,919\$803,266I AVG Annual CompensationElectrical equipment, appliance, and component manufacturing\$109,814\$109,814\$109,814I AVG Annual CompensationWholesale Trade\$84,287\$84,287\$84,287I Total CompensationElectrical equipment, appliance, and component manufacturing\$2,152,354\$1,844,875\$1,537,396Unclude CompensationElectrical equipment, appliance, and component manufacturing\$2,152,354\$1,844,875\$1,537,396 |

As in the motion picture example, we run the model under additional scenarios reducing the number of jobs and therefore the total compensation associated with the tax credit down to zero, which means allof these jobs would have been created without the tax incentive. Below, we will review a quick demonstration of how we enter this into REMI.



If we look at our input list, since the goals of this program are all about jobs, the inputs are all employment and compensation. We have the jobs created by NAICS industry and we include our compensation adjustment mentioned before. We also add the cost of the incentive in the same way, reducing government spending and using the accounting variable to reduce revenue. We would then run the forecast and view the results, which are shown below in Excel:

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| T . | 24 | Model O | itout | 100% | 90% | |
| | 26 | Model of | Employmento | 88 | 79 | |
| | 27 | | Direct | 45 | 41 | |
| | 28 | | Indirect | 16 | 15 | |
| | 29 | | Induced | 26 | 24 | |
| 0.45 | 30 | | GDP (\$000) | \$11,466 | \$10,269 | |
| | 31 | | Total Net Revenues (\$000) | \$155.8 | \$136.4 | |
| | 32 | | Personal Income Tax | \$92.1 | \$85.7 | |
| 100 | 33 | | General Business Taxes | \$42.5 | \$38.6 | |
| 143 | 34 | | Sales and Use Taxes | \$84.2 | \$78.4 | |
| 200 | 35 | | Other Taxes | \$4.2 | \$3.9 | |
| 1.00 | 36 | | Total Departmental Receipts | \$14.2 | \$12.7 | |
| 1.1 | 37 | | Other Sources | \$14.7 | \$13.2 | |
| 1.0 | 38 | | Check | -\$96.041 | -\$96.041 | |
| - | 39 | | - | | | |
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We have employment broken down by direct, indirect, and induced; GDP; and net revenue.

Analysis Findings and Breakeven Points

Seen here, in net revenue, the program breaks even somewhere between 30% and 40%. This is where we assume economic activity attributable to the incentive is between 30% and 40%. We determine the precise breakeven percentage by rerunning the scenario at 1% intervals until we find the point where net revenue is equal to zero.

| Model Output | 50% | 40% | 30% | 20% |
|-----------------------------|-----------|-----------|-----------|-----------|
| Employment | 45 | 35 | 24 | 16 |
| Direct | 23 | 18 | 14 | 9 |
| Indirect | 8 | 6 | 5 | 3 |
| Induced | 14 | 10 | 6 | 4 |
| GDP (\$000) | \$5,866 | \$4,539 | \$3,211 | \$2,140 |
| Total Net Revenues (\$000) | \$36.4 | \$5.7 | -\$25.1 | -\$48.0 |
| Personal Income Tax | \$48.9 | \$37.4 | \$26.0 | \$17.7 |
| General Business Taxes | \$22.2 | \$17.1 | \$12.1 | \$8.2 |
| Sales and Use Taxes | \$44.7 | \$34.2 | \$23.8 | \$16.1 |
| Other Taxes | \$2.2 | \$1.7 | \$1.2 | \$0.8 |
| Total Departmental Receipts | \$7.1 | \$5.5 | \$3.9 | \$2.6 |
| Other Sources | \$7.4 | \$5.7 | \$4.0 | \$2.7 |
| Check | -\$96.041 | -\$96.041 | -\$96.041 | -\$96.041 |



The above chart shows the estimated new revenue results for each scenario, showing how much economic activity is caused by the New Qualified Jobs Incentive Act. As you can see, under the best-case scenario, there is an estimated net revenue gain of \$155,000. Under the worst-case scenario, the estimated net revenue loss is \$101,000. The breakeven point, where revenue losses from forgone state government spending are offset by revenue gains due to the tax incentive, is when about 38% of economic activity generated by firms receiving new qualified jobs tax credits is caused by the tax incentive.

We also evaluate the program in terms of employment. It's difficult to determine the extent to which location and expansion decisions of New Qualified Jobs recipient companies were caused by the tax incentive. This chart shows the estimated new employment, which includes direct, indirect, and induced jobs under each scenario. The results indicate that under the 100% scenario, there's a net gain of 88 economy-wide jobs. And under the worst-case scenario, there's an estimated net loss of two jobs across the state economy. The breakeven point, where job losses from forgone state government spending are offset by job gains due to the tax incentive, is when about 2% of the economic activity generated by firms receiving the New Qualified Jobs tax credit is caused by the tax incentive.

*Note: The software discussed and screenshots are from the software owned and provided by RegionalEconomic Models, Inc.



Similarly, the chart above looks at GDP under the same scenarios. The results indicate that if 100% of the economic activity associated with the New Qualified Jobs tax credit is attributable to the availability of the tax incentive, there's a net gain of \$11.5 million in state GDP.

And at the other end, if the New Qualified Jobs economic activity would have taken place regardless of the availability of the tax incentive, there's an estimated net loss of about \$200,000 in GDP across the state economy. The breakeven point, where GDP losses from forgone state government spending are offset by GDP gains due to the tax incentive, is again when about 2% of the economic activity generated by firms receiving new qualified jobs tax incentives is assumed to be solely attributable to the tax incentive.

New Qualified Jobs Incentive Act



This table shows the summary of inputs and outputs for each scenario. Under the 100% scenario, the state gives about \$96,000 in incentives and receives about \$252,000 in new revenue. When we calculate the payback ratio, it shows that for every dollar the state spends on New Qualified Jobs tax credits, \$2.62 in new revenue is generated. This new revenue from incentivized activity is enough for the tax credit to pay for itself. In comparison, if you look at the 30% scenario, the state gives the same \$96,000 incentive but receives only \$71,000 in new revenue, so when we calculate the payback ratio, we see that for every dollar spent on new qualified jobs tax credits, the state generates only 74 cents in new revenue.

One's assumption about how much economic activity is caused by the incentive will affect the payback ratio and whether one determines if the incentive pays for itself. The New Qualified Jobs program is a good example of when there is a much higher breakeven percentage for net revenue compared with the break even for employment and GDP. This difference might imply that the economic activity induced by the incentive can enhance the state economy, but it might not be in a way that significantly increases state revenue.

Breakeven Cost-Benefit Analysis Takeaways



Using a breakeven analysis can be very informative and is a great tool to analyze many types of programs across different scenarios. However, there are some aspects of the economy that analyses likethis just can't capture, especially when there are data limitations. For example, without specific data on tourism, we cannot determine how much the Motion Picture Production Tax Credit program influences tourism. In addition, the breakeven analysis allows one to determine the percentage of economic activity needed for the incentive program to pay for itself, but it doesn't specify the true percentage of economic activity that was generated by the incentive program.

