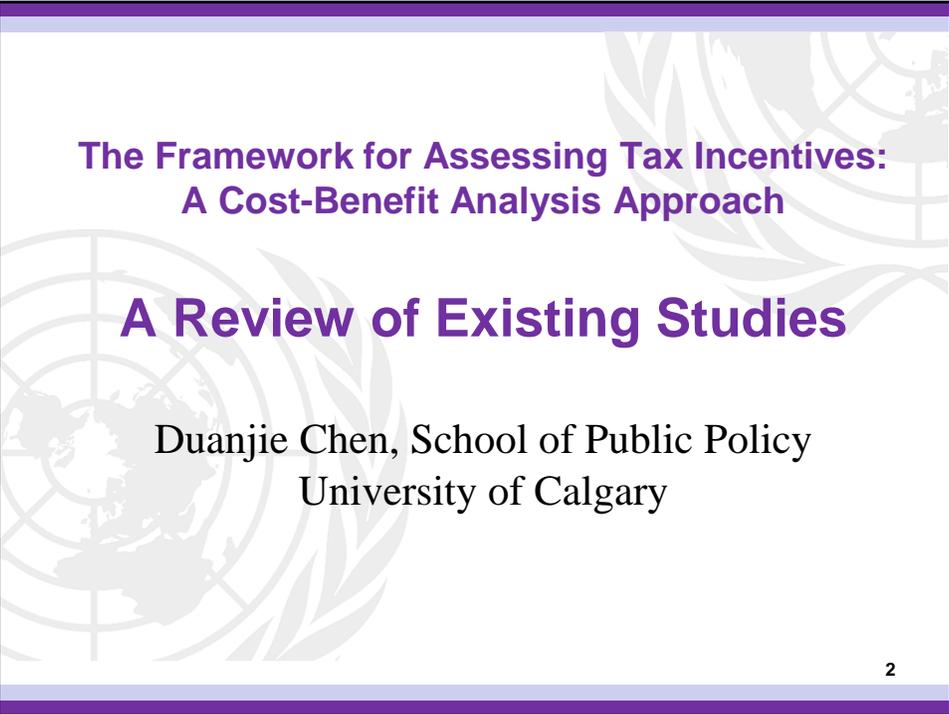




**UNITED NATIONS WORKSHOP ON
TAX INCENTIVES AND
BASE PROTECTION**

New York
23-24 April 2015

<http://www.un.org/esa/ffd/>



**The Framework for Assessing Tax Incentives:
A Cost-Benefit Analysis Approach**

A Review of Existing Studies

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Outline of Presentation

1. Fundamentals
2. Conceptual Framework
3. Review of Existing Studies
4. Conclusion

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1. Fundamentals

What are tax incentives?

Tax incentives are ***preferential*** tax treatments that ***deviate*** from the general tax structure and are provided only to a ***selected*** group of taxpayers.

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1. Fundamentals

Why tax in the first place?

- Raising revenue for government expenditure
- Ultimate tax base is GDP

Tax incentives?

- An intended erosion of the tax base
- Limited timeframe
- Expectation of growth in GDP, leads to expansion of the tax base.

Did they work as intended?

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1. Fundamentals

Principles of optimal taxation

- Efficiency
- Equity
- Simplicity
- **Tax incentives and violate all three principles**
 - *Violate the efficiency-principle: by lowering the tax cost to below average for a selected group of taxpayers to further distort resource allocation by market forces.*
 - *Violate the equity-principle: by treating taxpayers not by their ability to pay but by their economic significance as judged by the policy makers.*
 - *Violate the simplicity-principle: by adding discretionary layers to the general tax system.*

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1. Fundamentals

Justification for tax incentives (*in the order of legitimacy from high to low*):

1. Mitigate market failure
2. Complete for new/mobile activities without losing revenue from the existing tax base
3. Generate agglomeration economies
4. Hand pick winners and losers
5. Play politics and sustain bad governance

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1. Fundamentals

Regardless, by excluding bad governance, tax incentives can be justified only if they bring net benefit to society as a whole. This is where cost-benefit analysis is required.

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2. Conceptual Framework Defining Cost and Benefit

- **Cost**
 - Direct revenue loss caused by Tax Incentive Program (TIP)
 - Efficiency loss caused by TIP
 - Increased administrative and compliance cost
 - Their multiplier impact
- **Benefit**
 - Economic activities triggered by the direct economic impact of TIP
 - Economic activities triggered by the indirect economic impact of TIP
 - Multiplier effect of personal income generated from both direct and indirect impact; and
 - Revenue gains generated by all these economic activities traceable to the TIP.

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2. Conceptual Framework Defining Cost and Benefit (cont'd)

- I. Additionality
 - a. Redundancy ratio
 - b. Displacement share
 - c. Crowding-out probability
- II. Opportunity cost
- III. Additional cost
- IV. Multiplier effect: **negative** vs. positive

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2. Conceptual Framework Assessing TIP Impact by Stage

- **IMPACT** – cost and benefit as measured by economic activities (increased investment, jobs, GDP, and personal income) and their revenue consequences.
- **Direct** impact - economic activities directly stimulated by TIP and their revenue consequences.
- **Indirect** impact - economic activities triggered by the “direct impact” and their revenue consequences.
- **Induced** impact – multiplier effect of national income generated from both direct and indirect impacts and their revenue consequences.

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2. Conceptual Framework Exploring Alternative Options

- Alternatives to tax incentives
 - Spending on infrastructure
 - Loan guarantees
 - Support for training
- Forms of tax incentives
 - Tax credit
 - Tax allowance
 - Tax rate reduction
 - Tax holidays

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2. Conceptual Framework Sensitivity Analysis

What is Sensitivity analysis?

Involves varying an economic scenario by varying its input parameters.

Examples:

- Annual GDP Growth Rate
- Economic Multiplier
 - *Inter-industry linkage (backwards vs. forwards)*
 - *Marginal propensity to consume*
- Industry-Wide Profit Margin
- Redundancy Ratio

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2. Conceptual Framework Toolkit

- Bookkeeping (Accounting Data) – *Record Direct Impact*
- Input-Output Accounts – *Estimate Indirect Impact through inter-industry linkages*
- Computable General Equilibrium Model – *Estimate Indirect Impact by capturing the behavioral reactions*
- Micro-Simulation Model – *Estimate Indirect impact, in absence of input-output accounts and economic models by using taxpayers' accounting and tax information (e.g., firm-based financial statements and tax returns)*

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3. Review of Existing Studies

Overview

- Many studies are devoted to identifying and quantifying the effectiveness of tax incentive programs
- Few are intended to be a full-fledged cost-benefit analysis.
- Two official studies stand out for their
 - *Standard framework of a cost-benefit analysis*
 - *Use of the most sophisticated modeling tools*

My review is not intended to validate their conclusions but to explore their analytical ideas, or deficiencies, we can borrow, or should avoid.

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3. Review of Existing Studies

The Massachusetts Study

Massachusetts Film Industry Tax Incentives (MFITI):

- Creditable and Transferrable Tax Credit equal to
 - *25 percent of a film's production cost, and*
 - *25 percent of a film's payroll costs*
- Exemption from Sales Tax for film productions.

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3. Review of Existing Studies

The Massachusetts Study

- Purpose of the Study: *Estimate the impact of the film tax incentives on the state economy*
- Analytical Tool:
 - *Regional Economic Model*
 - *Incorporates four major modeling approaches, including I-O accounts and CGE model*
 - *Capture Overall Economic Impact (through inter-industry linkages and behavior reactions attributable to tax incentives)*

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3. Review of Existing Studies

The Massachusetts Study

Primary Input Data:

- 1) Total amount of Tax Credits: *Generated, Claimed, and Paid*
- 2) Type of Film Productions claiming the Tax Credits
- 3) **An estimate of the film production activity that would have occurred in Massachusetts even in the absence of the tax incentives;**
- 4) The wage and non-wage spending for film productions that claimed the tax incentives

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3. Review of Existing Studies

The Massachusetts Study

- 5) **The wages and salaries that were paid to Massachusetts residents and non-residents;**
- 6) **The non-wage spending that was paid to Massachusetts-based and out-of-state businesses;**
- 7) The number of new jobs generated by film productions that claimed the tax incentives, for both residents and non-residents; and
- 8) The net increase in the amount of spending that occurred in Massachusetts as a result of the film tax credits.

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3. Review of Existing Studies

The Massachusetts Study

The relevance of the input data to assessing net benefit:

- *Differentiating “redundant” activities from those truly “additional” due to tax incentives.*
- *Segregating the spending of “additional” activities on resident and non-resident groups*

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3. Review of Existing Studies

The Massachusetts Study

Intriguing point -

*The initial cost of tax incentives has a **negative multiplier impact** on the economy and government revenue.*

Technical details -

Total film tax credits issued, net of taxes paid by the out-of-state film producers, is subtracted from the initial direct impact so as to be a negative factor for estimating the multiplier impact on the economy.

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3. Review of Existing Studies

The Massachusetts Study

Quantitative Finding (2011)

- (1) **Total credits issued: \$44M** (= 25% x \$176M)
- (2) Total film production spending: \$176M
- (3) Direct impact: \$38.7M, after subtracting from total spending of \$176M the following:
 - “redundant” spending (\$1.4M),
 - spending on non-residents wages (\$84.8M)
 - non-wage spending on non-MA vendors (\$27.4M)
 - reduced government spending to balance budget (\$23.7M)
- (4) State GDP (with multiplier effect): \$118M
- (5) State personal income (net of non-resident portion): \$26.7M
- (6) **State tax revenue: \$6.9M**
- (7) **Net \$ cost to State: \$37.1M**

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3. Review of Existing Studies

The Massachusetts Study

My evaluation Grade: A+ because of --

- Thorough report and deliberation of the direct impact,
- Coverage of efficiency loss (through its estimate of “redundant” film production),
- Exclusion of TIP impact “leaked out” of the state,
- Estimate of the negative multiplier (*impact of revenue loss caused by TIP*)
- Revelation of the negative government revenue impact.

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3. Review of Existing Studies

The Nevada Study

The Tax Incentive Package:

- 100% Tax Abatement :
 - *Real and Personal Property Tax till June 2024.*
 - *Modified Business Tax (MBT), a total-payroll-based tax.*
- 100% Exemption for State and Local Sales Taxes : *Equipment Purchases and Construction Materials for 20 years.*
- Transferable Tax Credit :
 - *Per-job based, \$12,500 transferable tax credit for the first 6,000 new jobs created, totaling \$75 million.*
 - *Another tax credit totaling \$120 million combining 5-percent of the first \$1 billion investment and 2.8-percent of the next \$2.5 billion investment.*

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3. Review of Existing Studies

The Nevada Study

➤ **The Tesla Investment and Operational Plan:**

- Facility construction: \$1.0 billion in first 3 years
- Equipment investment: \$3.95 billion over 2015-2018
- Manufacturing job up to 6,500 by 2018
- Substantial power consumption to generate utility fees to the host county.

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3. Review of Existing Studies

The Nevada Study

➤ **Nature of the study:**

To demonstrate Tesla's significant positive economic and revenue impact on Nevada

➤ **Analytical tool:**

- *Popular modeling software (including IMPLAN REMI and EMSI that are supposed to Capture all the indirect impact of tax incentives)*

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3. Review of Existing Studies

The Nevada Study

Quantitative Findings

➤ Economic Impact:

- Direct Impact: 6,500 jobs & annual income \$370m
- Indirect and Induced impact: 6,400 - 16,200 jobs & annual income of \$334m- \$953m*
- Total Impact: 12,900 - 22,700 jobs with annual income of over \$700m - \$1.3b *

➤ Revenue Impact:

- Direct impact: \$460 million over 20 years
- Indirect and induced impact (due to additional jobs and population): \$776m- \$1,487m*

* The lower and higher bounds are associated, respectively, with the regional and the national multipliers.

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3. Review of Existing Studies

The Nevada Study

My Main Criticism

1. How critical is Nevada's tax incentive package to Tesla's Gigafactory?

Nevada was actually Tesla's **best bet** with all the attributes desired by Tesla that no other state can match:

- ✓ Geographic Proximity (only about 400 km to Tesla in California)
- ✓ Active Lithium Resources (the only state with such resources)
- ✓ Solar Energy (plenty of sunshine)
- ✓ "Right politics" (as a "right-to-work" state)
- ✓ "Right people" (construction skill)
- ✓ High-Tech Facilities (Apple and Amazon are already in the area)
- ✓ Top 3 in the State Business Tax Climate Ranking.

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3. Review of Existing Studies

The Nevada Study

My Main Criticism (cont'd)

2. The **upper scenario** resulting from applying the national multiplier (which captures both in- and out-of-state economic impact) and assumed by the government **is an overestimate**.

That is, the government assumed that the supply chain for Tesla will be ultimately fully materialized within Nevada. This is against the reality of modern supply chains, which led to Tesla's building its battery-producing facility in Nevada rather than its home state, California.

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3. Review of Existing Studies

The Nevada Study

My Main Criticism (cont'd)

3. Overlooked the **additional cost** that government must pay to accommodate the substantial population increase if the Tesla plan and the government estimate of job growth (22,700) and population increase (49,000) are both true.

Ironically, the Study used its estimated population increase as a base for estimating the property and sales tax revenue without offsetting its revenue estimate by the required spending to accommodate such population expansion.

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3. Review of Existing Studies

The Nevada Study

My Main Criticism (cont'd)

4. **Double accounting of the benefit:**

- On the one hand, counting all the direct Tesla jobs (6,500) and related population increase as an addition to the existing tax base for the state property tax and indirect tax revenue, implying a net job and population increase to the state that will not benefit the existing population in terms of job creation and income growth.
- On the other hand, counting the Tesla jobs as a net benefit to the state to justify its offer for the per-job-base transferrable tax credit.

The truth can be only a combination of lower revenue gain (because of within-state relocation of jobs and population) and some (and possibly great) waste of the per-job-based transferable tax credit (because some jobs will go to non-residents)

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3. Review of Existing Studies

The Summary

Similarity:

- Both the Massachusetts Study and the Nevada Study applied the same economic concepts and used the same sophisticated modeling tools in their cost-benefit analysis.

Contrasts:

- The Massachusetts Study, by following its discipline on balance budget, showed itemized costs and benefits and concluded with an insignificant economic gain and a significant revenue loss from its TIP. In contrast,
- The Nevada Study, by taking Tesla's plan as given with no conscience on the government's debt-laden budget, casually presented a rosy picture for the economic and revenue impact of its TIP.

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4. Concluding Remark

The intention for and dedication to a full accounting of cost and benefit is often more critical than the availability of analytical tools.