



Statewide Model and Dynamic Scoring

Revenue Estimating Training Workshop Retreat

October 30, 2012

Office of Economic & Demographic Research



Background

In 2010, the legislature identified a need for a formal conference process to evaluate legislative proposals using tools and models which accounted for all of the economic impacts, not just the immediate (direct) impacts

The legislature passed Chapter 2010-101, Laws of Florida, authorizing special impact estimating conferences which would employ such tools

The legislature provided EDR with additional staff to develop the protocols and procedures to be used by the conferences

The legislature also provided EDR with funds to invest in the tools and models needed to conduct such evaluations



Legislative Recognition

Chapter 2010-101, Laws of Florida, created section 216.138, Florida Statutes, which states:

(1) The President of the Senate or the Speaker of the House of Representatives may request **special impact estimating conferences** to evaluate legislative proposals based on tools and models not generally employed by the consensus estimating conferences, including cost-benefit, return-on-investment, or dynamic scoring techniques, when suitable and appropriate for the legislative proposals being evaluated.

Note: As is the case today with other research requests, in addition to the special impact estimating conferences these tools will be employed informally as a part of EDR's on-going legislative support.



Special Impact Conference—Why?

- Recall impact conference convention — typically does not consider secondary effects of legislation
 - Given options, which tax incentive or investment is likely to promote the most economic growth?
 - Do the total expected benefits (monetary and non-monetary) of a policy outweigh the costs?
 - Will tax incentive or investment result in additional economic activity that generates additional revenues that offset, to some degree, the cost of the policy?



Special Impact Conference – Procedure

- The President or the Speaker may request a special impact estimating conference to evaluate a proposed fiscal policy change
- EDR will analyze the request and determine which analytical technique to employ to evaluate the proposal and request principals be designated
- A minimum of three meetings will be held for each special impact estimating conference
- All actions and the final report will be adopted by consensus of the Conference principals
- The final report will be transmitted to the presiding officers and posted on the EDR website



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Return-on-Investment

- Policy analysis technique to evaluate the efficiency of an investment
- Results are expressed in percentages or ratios of the financial gains less the investments, divided by the investment amount (alternative calculations are sometimes used --- perspective is important)
- Non-monetary variables are generally not included
- Analyses are usually multi-year
- Costs and benefits projected over time are adjusted for the time value of money, e.g., net present value
- It is possible for a project or program to have a negative return on investment but still be desired (for example, to subsidize an essential activity that wouldn't otherwise have occurred)

Potential Best Usage: Discrete investments with subsequent payoffs where general societal benefits are of negligible concern (e.g., toll roads) or to compare the efficiency of a number of different investments (ranking)



Cost-Benefit

- Policy analysis technique to compare the total expected benefits to the total expected costs of a policy change or program in order to see if the benefits outweigh the costs
- Results often expressed as a ratio (benefits / costs)
- Non-monetary variables, such as quality of life, and opportunity costs, such as the best alternative use given up, should be included and quantified into monetary terms if at all possible
- Calculations usually include a specific time dimension
- Costs and benefits projected over time should be adjusted for the time value of money, e.g., net present value

Potential Best Usage: Appropriations or discrete tax changes which may have a significant societal cost or benefit, e.g., Everglades Restoration; feasibility of new projects or plans



Dynamic Scoring

- Policy analysis technique to evaluate the direct, indirect and induced economic impacts of a policy change
 - Direct economic effects – change in expenditures by the industry(ies) directly impacted by a change in policy
 - Indirect economic effects – change in expenditures by industries that supply goods/services to the directly impacted industry(ies)
 - Induced economic effects – change in expenditures by households whose income is changed by the direct and indirect activity
- Predicts and quantifies the impact of changes in fiscal policy (revenue and budget)
 - Projections are relative to a forecast of current policy (baseline)



Dynamic Scoring (Cont.)

- Forecasts the behavioral changes of taxpayers or consumers to the proposed policy change
 - Assumes all taxpayers act in a manner that minimizes taxes and maximizes income
 - Assumes all taxpayers or consumers understand the full implications of the proposed policy change and act in their own best interests
- Quantifies the macro-economic impact of the behavioral changes
- Analyses are multi-year
- All values projected over time should be adjusted for the time value of money, e.g., net present value

Potential Best Usage: Larger initiatives that will likely have significant statewide economic impacts and will likely change taxpayer or consumer behavior, e.g., elimination of Highway Safety Fees or elimination of a core state program

Economic Analysis Techniques Matrix

Effects	Return on Investment	Cost Benefit	Dynamic Analysis (Statewide Model)
Monetary	✓	✓	✓
Non-Monetary		✓	Limited
Indirect / Induced		Limited	✓
Behavioral Changes		Social Welfare	Economic
Ranking of Alternative Public Investments	Narrowly Defined Using Uniform Criteria	Broadly Defined Using Multiple Approaches	Economically Defined
Size of Proposal or Scope of Review	Any Size	Any Size	Initially: \$25M or more Later: \$10M or more
		Return on Investment	

Economic Example

If you give a mouse a cookie

- You pay \$1 to the baker for the cookie
- The baker spends the \$1
 - \$.25 to employee
 - \$.20 to grocer
 - \$.15 to landlord
 - \$.20 to self
 - \$.15 to federal taxes
 - \$.05 to state taxes
- The state deposits the funds into state accounts and spends it
 - \$.03 on various services
 - \$.02 on state payroll
- State employee saves pennies and buys another cookie



Statewide Model Development

Requirements

- A statewide model must contain a vast amount of data to replicate the economy and government finances of the state of Florida
- A statewide model must have many equations to account for the linkages and interactions between the areas and industries of the economy within and outside of Florida – as well as responses by businesses and households to changes in the economy
- A statewide model, to be useful in the state government budgeting process, must have a time dimension that adheres to the state fiscal year (July 1 to June 30)
- A statewide model must perform many calculations to account for all of the changes and responses by industry and households that will result from a change in legislation or budget (shock) and must do so over a multi-year timeframe

Economic I/O Table

		Institutions					Change in Inventories	Total Receipts
		Intermediated Demand	Final Demand					
Receipts	Expenditures	Producers	Investors	Households	Exports	Government		
	Commodities	Basic Flows, Domestic	Intermediate Purchases of Domestic Commodities at Basic Prices	Investment Purchases of Domestic Commodities at Basic Prices	Household Purchases of Domestic Commodities at Basic Prices	Exports of Domestic Commodities at Basic Prices	Government Purchases of Domestic Commodities at Basic Prices	Inventory Investment in Domestic Commodities at Basic Prices
Basic Flows, Imported		Intermediate Purchases of Imported Commodities at Basic Prices	Investment Purchases of Imported Commodities at Basic Prices	Household Purchases of Imported Commodities at Basic Prices	Exports of Imported Commodities at Basic Prices	Government Purchases of Imported Commodities at Basic Prices	Inventory Investment in Imported Commodities at Basic Prices	Total Imports
Margins		Transportation/ Trade Markup on Commodity Basic Price	Transportation/ Trade Markup on Commodity Basic Price	Transportation/ Trade Markup on Commodity Basic Price	Transportation/ Trade Markup on Commodity Basic Price	Transportation/ Trade Markup on Commodity Basic Price		Total Margins
Taxes	Indirect Taxes	Indirect Taxes on Intermediate Purchases	Indirect Taxes on Investment Purchases	Indirect Taxes on Household Purchases	Indirect Taxes on Exports	Indirect Taxes on Government Purchases		Total Indirect Taxes
	Production Taxes	Taxes on Output						Total Production Taxes
Primary Factors	Labor	Employee Compensation						Total Labor Income
	Capital	Proprietors' Income, Corporate Profits, Depreciation						Gross Operating Surplus
	Land	Rental Costs						Total Rent Costs
	Total	Industry Outlays at Producer Prices	Investment at Purchaser Prices	Household Expenditures at Purchaser Prices	Exports at Purchaser Prices	Government Outlays at Purchaser Prices	Inventory Investment	

Note: Table does not include inter-institutional transfers



Statewide Model Development

- During 2010, researched the literature and communicated with other states that have attempted dynamic scoring at a state level
 - A few states have static computable general equilibrium (CGE) models
 - A few states have developed small econometric models
 - A few states have attempted to use REMI for this purpose
 - The Beacon Hill Institute has developed a State Tax Analysis Modeling Program (STAMP) model for some states
- None of the states were performing true dynamic scoring within a budgeting framework
- The REMI and STAMP models have limited state specific government revenue and expenditure capabilities
- EDR identified a need to develop a custom model that takes into account Florida's statutory tax and budget structure
- EDR decided to pursue development of a dynamic CGE model



Model – Computable General Equilibrium (CGE)

- A class of economic models using economic data to estimate how an economy may react to changes in policy, technology or other factors
- CGE models consist of a database of economic variables and equations describing the relationships between those variables
- The database contains variables representing the entire economy:
 - Industry sectors
 - Commodities
 - Institutions – households, government and businesses
 - Primary factors of production – capital, labor and land
 - Elasticities – parameters that capture behavioral responses:
 - Export demand changes in response to export price changes
 - Production input changes in response to price changes
 - Household demand changes in response to income changes
- Dynamic CGE models trace each variable through time



Statewide Model Development

- Researched dynamic CGE models and software that could be used to develop a Florida specific model for performing dynamic scoring
- Selected GEMPACK as software for the Statewide Model
- Contracted with the Monash University Centre of Policy Studies (CoPS) to develop the first-generation Statewide Model in conjunction with EDR
 - Performed initial analysis of the interaction of state revenues and the economy
 - Performed initial analysis of the interaction of the state budget and the economy
 - Performed initial analysis of economic shares and incidence for businesses, residents and tourists
- The model is operational and refinements will be on-going
- The model will be peer reviewed this year
- Currently, EDR is also running REMI Tax-PI to estimate impacts



Report Variables

- The reported core variables will generally depend on the type of analysis being performed
- Initially the core variables to be reported are:
 - Personal income
 - Household consumption
 - State government revenues and expenditures
 - Investment / Savings
 - Gross state product
 - Gross output
 - Population
 - Jobs
- After gaining experience with the model additional variables will be reported



Protocols

- Single region statewide model
- Balanced budget requirement by fiscal year
- Model calibrated for current budget policy and the official economic and state revenue forecast, referred to as the baseline
- All analyses performed in a given year will be compared to the same baseline
- Discount rates will be applied across years in multi-year analyses
- Initially, model results will be treated as supplemental information that runs parallel to the traditional, static analyses
- The goal over time is to allow for greater integration of the model results with the budget process



Benefits

- 10 year, year-by-year, projections of state revenue, state budget and economic activity (no other state has a year-by-year model)
- Florida-specific industry mix
- Florida-specific tax and budget structure
- Balanced budget mechanism
- Direct, indirect and induced economic and state revenue impacts resulting from policy changes
- Incorporates the changes in behavior of economic agents