
TRAIN
Tax - Revenue Analysis In Nebraska

Presented by:

HoaPhu Tran, Ph.D. and Iksoo Cho, Ph.D.

Nebraska Department of Revenue

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Outline

- Background and Introduction
 - Structure of TRAIN
 - Government Sector
 - Dynamics of TRAIN
 - Example and result from TRAIN.
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Background

- Developed in 1998 to evaluate a tax incentive program (Dr. Cho and Dr. Cushing)
 - An adaptation of DRAM (Dynamic Revenue Analysis Model) constructed by Berck, Golan, and Smith (1996)
 - TRAIN was specifically built to reflect the condition of the Nebraska Economy
 - 2001 – updated CGE TRAIN to dynamic version of TRAIN
 - The model is updated every two years with new data
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Introduction

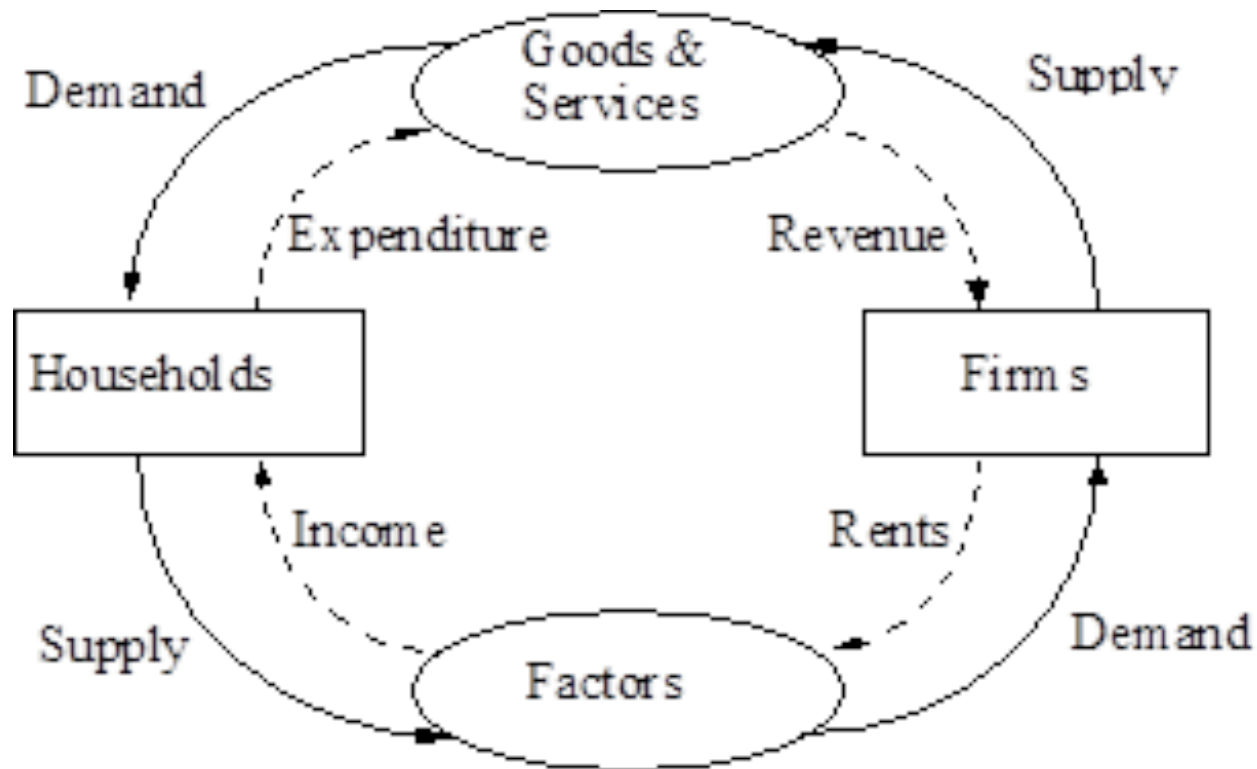
- Dynamic Computable General Equilibrium Model (CGE)
 - Specialized for the Nebraska economy
 - Contained approximately 1,300 mathematical equations and identities
 - Utilized GAMS for programming the model
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Structure of TRAIN

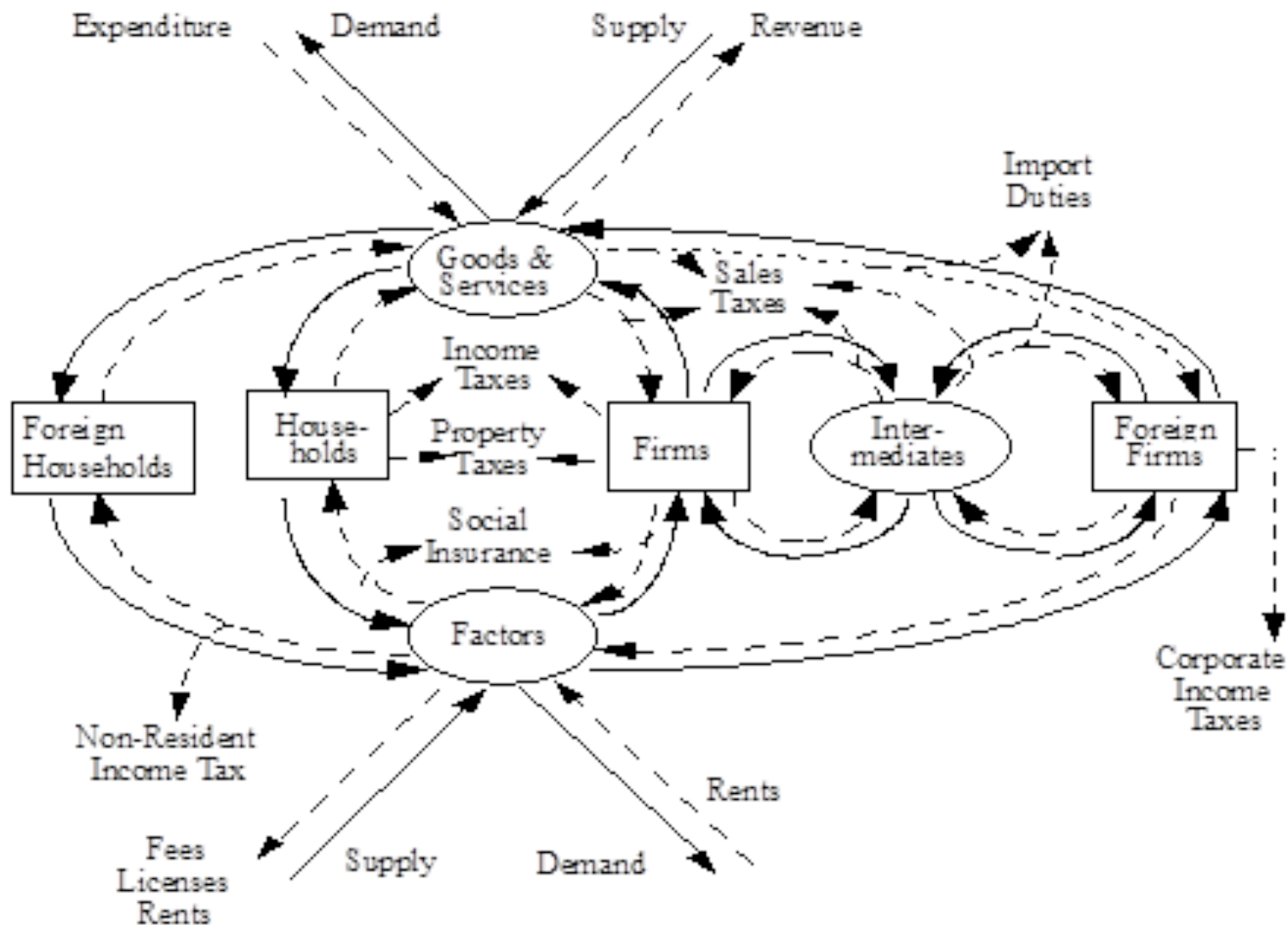
- Model to describe the interaction of economic agents:
 - Producers
 - Consumers
 - Governments
 - Rest of the world

Structure of TRAIN

- Basic circular diagram



Structure of TRAIN



Structure of TRAIN

- To describe major features of the Nebraska economy, the TRAIN model divides the Nebraska economy into 74 distinct sectors:
 - 28 Industrial sectors
 - Detailed in food manufacturing and farm machinery
 - 2 Factor sectors
 - Capital and labor
 - Investment sector
 - 9 Household sectors
 - By income level (AGI)
 - 33 Government sectors
 - Rest-of-the-world sector
 - All agents outside of Nebraska

Household Sector

Household	Gross Income Range (\$)
1	0 – 10,000
2	10,001 – 15,000
3	15,001 – 25,000
4	25,001 – 35,000
5	35,001 – 50,000
6	50,001 – 75,000
7	75,001 – 100,000
8	100,001 – 150,000
9	Above 150,001

Government Sectors

Government 1 of 3

Federal

Sector	Description	Major Revenue Source(s)
Revenue : 5 Sectors		
FTSOC	Social-security tax	Industries Households
FTPIT	Personal income tax	Households
FTPRO	Corporation income tax	Industries
FTDUT	Import duty tax	Industries
FTMSC	Miscellaneous taxes	Industries Households
Expenditure : 2 Sectors		
FSDNO	Federal non-defense spending	
FSDDE	Federal defense spending	

Government Sectors

State Revenue

Sector	Description	Major Revenue Source(s)
NTINS	Insurance tax	Insurance premiums tax
NTMVS	Motor vehicles	License fees, Registration fees, Title fees
NTGAS	Gasoline	Motor fuels tax, Aircraft fuels tax
NTSAU	Sales	Sales and use taxes
NTPRO	Bank & Corporation	Corporation income taxes
NTLAB	Unemployment Insurance	Compensation insurance fund
NTPIT	Personal income tax	Personal income tax
NTUNI	University fees	Nebraska state university fees
NTINH	Inheritance	Transfer tax
NTSIN	Alcohol, tobacco & horse racing	Alcoholic tax, Cigarette tax, Wagering tax
NTMSC	Miscellaneous taxes	Remaining revenue
NGENF	General Fund	State revenue units, Investment

Note: Inheritance tax ended in 2007

Government Sectors

State Expenditure

Sector	Major Departments	Major Sources of Revenue	Major Expenditure
NSTRA	Transportation	Highway taxes, Motor-vehicle Fees	Engineering, Construction, Transfers to local
NSCOR	Youth and adult correction	General fund	Labor, Goods & services
NSK12	Education	General fund	Transfers to local
NSUNI	Higher education	General fund	Labor, Goods & Services
NSHAW	Health and welfare	General fund, Transfers from federal	Transfers to households And local
NSOTH	Legislature, Social services, Water resources, Administrative services, etc.	General fund, Special funds	Rental of factors, Labor, Goods & services, Transfers to Local

Dynamics TRAIN

- Allow the model to trace economic impacts of policy decisions through time
 - The economic growth is in a steady-state path
 - The growth over time through capital accumulation and population increase
 - Investment response to the rate of return; is independent of savings
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Dynamics TRAIN

Period t				Period (t +1)
Endowment	Stage 1	Result of Stage 1	Stage 2	Endowments
Labor stock	Calculation of static CGE	After-tax Real wage	Labor migration	Updated labor stock
Capital stock		Prices of goods	Net investment	Updated capital stock
		Output level		
		Rental price of capital		

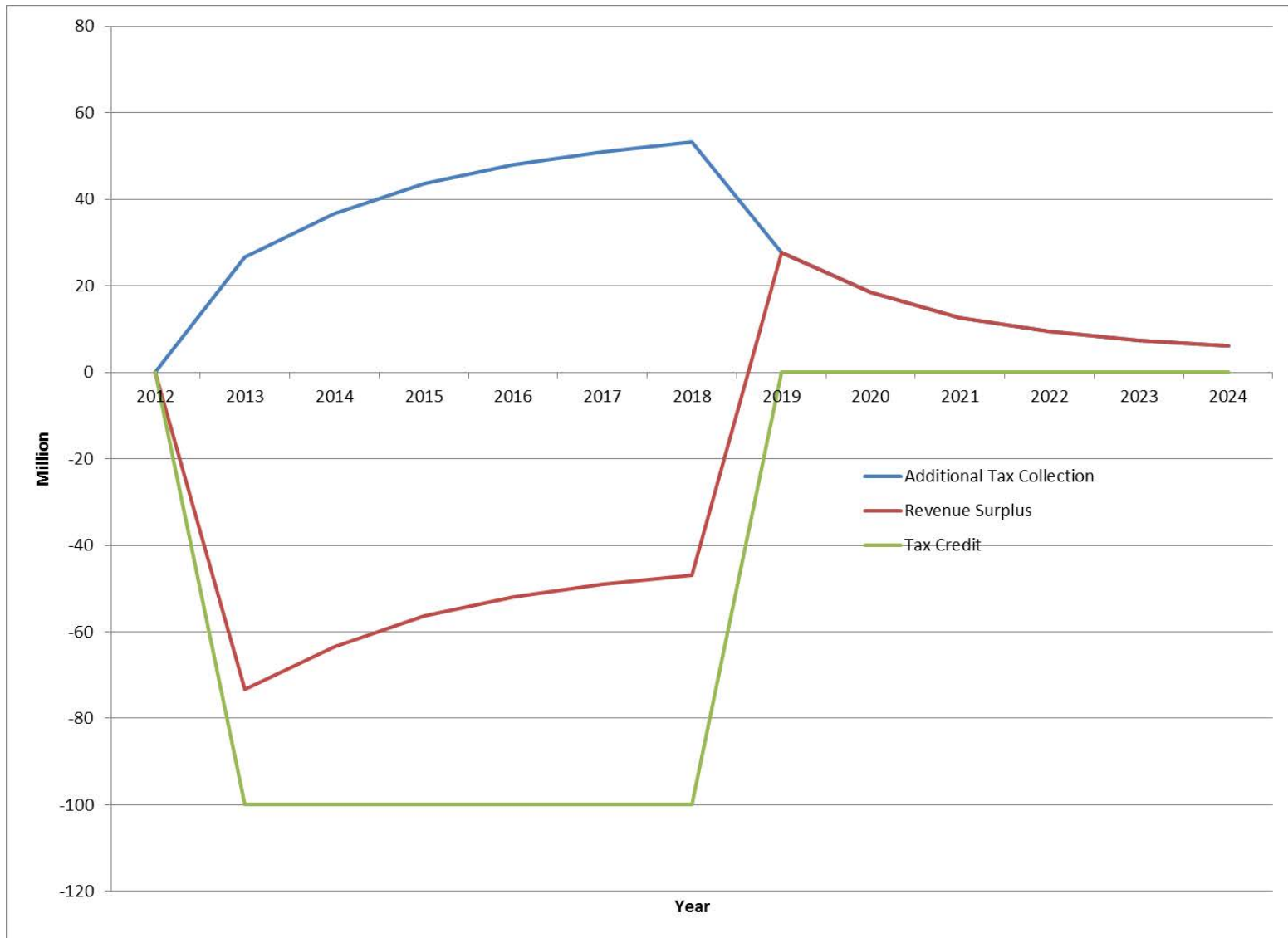
Usage of TRAIN

- Tax Incentive Analysis
 - Estimating fiscal impacts and jobs created by tax credits
 - Reporting it as a part of an annual report
 - Tax Burden Study
 - Evaluating fiscal and economic impacts of alternative tax policies such as an income tax reduction
 - Examining the shift of tax incidence among agents (sectors)
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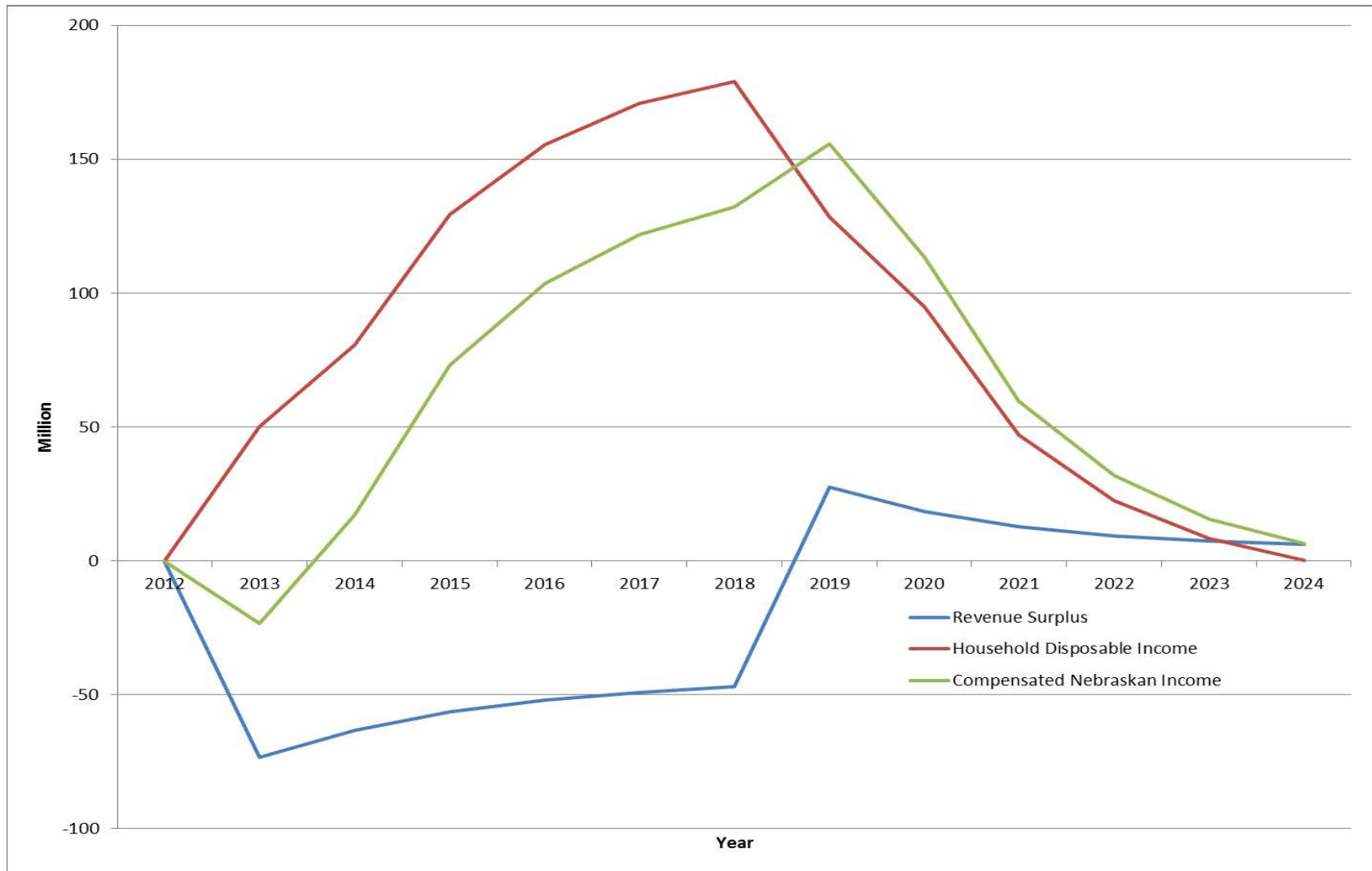
Example: Evaluating Tax Credits

- Estimating the impacts of an investment tax credit
 - Hypothetical Scenario:
 - \$100 million in tax credits per year to selected industry
 - 6 year time frame – 2013 to 2018
 - Base: 2012 Nebraska economy
 - Result for:
 - Impact on state overall tax revenue
 - Impact on state employment
 - Impact on state income level
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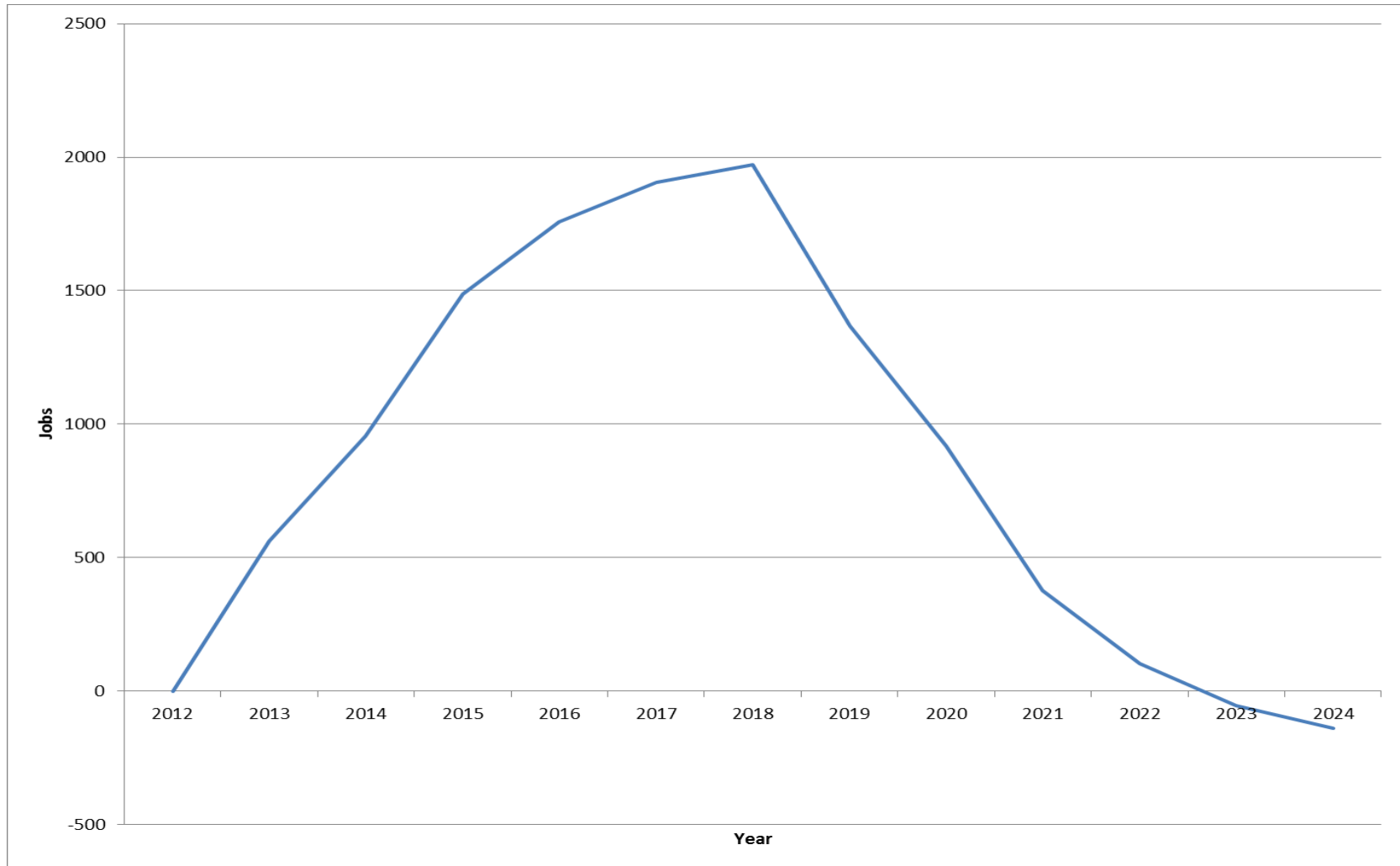
Change in Tax Revenue



The Effects on Income and Revenue



Change in Employment



More Information on Model

- Description of TRAIN
 - revenue.nebraska.gov/research/TRAIN_Tech_Doc_7-12.pdf
 - Tax Incentive Analysis
 - revenue.nebraska.gov/incentiv/annrep/13an_rep/neb_adv/neb_adv_project.html
 - Tax Burden Study
 - revenue.nebraska.gov/research/2010TaxBurdenStudy.pdf
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Questions?

- Contact:
 - HoaPhu Tran – hoaphu.tran@nebraska.gov
 - Iksoo Cho – Iksoo.cho@nebraska.gov

