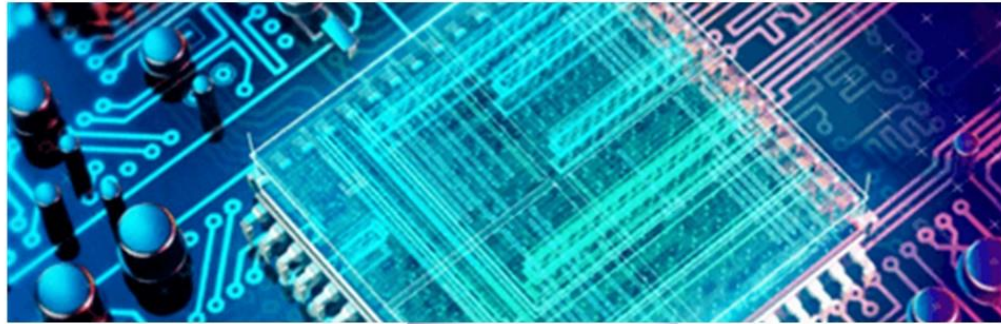




Regional Economic Models, Inc.



Economic and Fiscal Impact of Establishing a Semiconductor Manufacturing Facility in Onondaga County, New York



September 29, 2022

Sponsor
Empire State Development



**Empire State
Development**

Principal Investigator
Peter Evangelakis, Ph.D.

Project Manager
Chris Judson

Economic Analysts
Haozheyi Guan
Zhuyin (May) Lin

Table of Contents

Table of Contents	2
Executive Summary	3
REMI Background & Experience	6
REMI Glossary	7
Introduction	8
Methodology	9
Capital Expenditures, Infrastructure, and Others	9
Operations	10
Contractors	11
Results	13
Employment	13
Economic Output & Gross Domestic Product	14
Population	14
Personal Income & Disposable Personal Income	15
State Government Revenue	15
Local Government Revenue	16
Incentives Offer Analysis: Current Dollar \$5.8 Billion, 3 Percent Discount Rate	17
Conclusion	19
Appendix I: Supplemental Tables	20
Incentives Offer Analysis: Current Dollar \$5.8 Billion, 6 Percent Discount Rate	20
Current Dollar Tables	22
Appendix II: REMI Model Framework & Fiscal Calibration	23
REMI Model Framework	23
Fiscal Calibration	27

Executive Summary

Micron Technology, Inc., a manufacturing company is considering a project to construct, fit-out, and equip several large facilities in Onondaga County, New York. Regional Economic Models, Inc. (REMI) was retained by Empire State Development to perform an economic and fiscal impact analysis of the facility at the state and local levels. REMI analyzed the facility's economic and fiscal impacts over the period 2025-2055 using a New York-specific multi-regional Tax-PI model.

The company would ramp up operations over two phases (Phase 1: 2025-2034, Phase 2: 2035-2044) while investing \$99.6 billion capital investment (construction and machinery and equipment). In addition, there would be infrastructure (utility construction) and other investments of \$1.5 billion. Ongoing direct employment in the facility would be 9,005 jobs as of 2045. Additionally, there would be Research and Development (R&D) spending of \$3.3 billion over the period 2026-2045. Given the propensity of chip fabs to remain in operation for decades, the economic impact analysis conservatively assumed an additional 11 years of operations on top of the 20-year period in which Phases 1 and 2 capital expenditures would be completed. R&D spending would continue over the period 2046-2055. This direct activity and spending would be accompanied by ongoing employment of 5,772 in-state resident and 1,924 out-of-state visiting contractors as of 2036.

REMI analyzed the facility's economic and fiscal impacts over the period 2025-2055 using a New York-specific multi-regional Tax-PI model, and found the following key results:¹

- The facility would create an average annual employment impact of 45,418 at the state level over the time period 2025-2055, with 39,975 of those jobs coming from the Central New York region.
- For every direct company hire², there would be about 5.5 other jobs created in the state economy.³
- By 2055, the facility would create 50,911 jobs at the state level (44,943 of which would be based in Central New York), including 9,005 of the facility's direct hires and 9,431 indirect and 32,474 induced jobs (indirect and induced 41,905).
- The average annual total investment employment impact associated with the capital and other infrastructure spending (2025-2044) would be 11,871 (6,647 direct; 1,146 indirect; 4,079 induced). In terms of the direct investment employment, construction related jobs would be over 84 percent (5,595) on average during the 2025-2044 timeframe.

¹ Unless stated otherwise, annual averages are over the entire 31-year period (2025-2055). Figures and numbers may not add-up exactly due to rounding.

² These refer to the facility's direct hires as well as jobs directly associated with the capital investments.

³ Direct company hires are also referred to as Direct Operations Employment.

- The facility would grow the state economy significantly, adding an annual average of \$16.7 billion in real economic output and \$9.6 billion in real Gross Domestic Product (GDP) over the time period 2025-2055.⁴
- The facility would add an annual average of 59,575 in state population over the time period 2025-2055.
- The facility would add an annual average of \$5.4 billion in real disposable personal income for New York residents over the time period 2025-2055.
- The facility would generate an average annual increase of \$378.5 million in real state government revenue, for a present value (PV) of \$7.1 billion over 2025-2055 using a three percent discount rate, and a fiscal benefit-cost ratio of 2.0 relative to the PV of proposed real New York State incentives at a three percent discount rate.⁵
- The facility would generate an average annual increase of \$565.5 million in real revenue to local governments in New York State, for a PV of \$10.7 billion over 2025-2055 using a three percent discount rate. Most of these revenue gains would occur in Central New York region.
- The ROI real Gross Domestic Product ratio would be 51.5 using a three percent discount rate. The ROI (return on investment) real GDP ratio is defined as the PV of real GDP impact over the period 2025-2055 to the PV of real New York State Incentives over the period 2025-2055.
- *Economic Benefit* measure is defined by ESD as the sum of the real disposable personal income, real state government revenue, and real local government revenue impacts. The Economic Benefit ratio, which is calculated as the ratio of the PV of the real Economic Benefit to the PV of the real New York State Incentives, comes out to 33.6 (using a three percent discount rate over the period 2025-2055).

The Executive Summary Table below displays the 2055, average, and PV with three percent discount rate values of employment (direct, direct operations, indirect, induced), real GDP, real economic output, real disposable personal income, real state government revenue, real local government revenue, real Economic Benefit, and real New York State Incentives. During 2025-2055, real state government revenue increases by \$378.5 million on average. Approximately 66 percent of the real revenue is from the personal income tax. The table below also isolates the direct company hires (Direct Operations) for reference.

⁴ For purposes of this report, real dollar figures are in fixed 2025 dollars.

⁵ New York State incentives total \$5.8 billion current dollars, and are converted into 2025 dollars using a price deflator.

Executive Summary Table

	2055	Annual Average (2025-2055)	PV (3%)
Employment	50,911	45,418	
Direct	9,005	11,182	
Direct Operations	9,005	6,894	
Indirect	9,431	8,294	
Induced	32,474	25,943	
GDP (Millions of 2025 Dollars)	13,183	9,601	182,496
Output (Millions of 2025 Dollars)	22,835	16,652	317,419
Disposable Personal Income (Millions of 2025 Dollars)	8,330	5,429	101,393
State Revenue (Millions of 2025 Dollars)	545	379	7,114
Local Government Revenue (Millions of 2025 Dollars)	800	566	10,727
Economic Benefit (Millions of 2025 Dollars)	9,674	6,373	119,235
NYS Incentives \$5.8 Billion Current Dollar Offer (Millions of 2025 Dollars)		151	3,544

	PV (3%)
Fiscal Benefit-Cost Ratio	2.0
Economic Benefit Ratio	33.6
ROI Real GDP Ratio	51.5

Note: Present value calculations are over the 2025-2055 timeframe.

REMI Background & Experience

Regional Economic Models, Inc. (REMI) is an independent company with offices in Amherst, MA and Washington, D.C. that provides non-partisan economic analysis and modeling software to its clients, who include federal, state, and local government agencies, non-profit organizations, universities, and private companies. With approximately 40 years of experience, REMI is a worldwide leader in providing dynamic regional U.S. macroeconomic and demographic models used to evaluate economic development as well as many other policy issues such as taxes, health care, transportation, energy and the environment, and trade. REMI consultative services and modeling software have been utilized on several economic development studies in New York, in addition to other semiconductor manufacturing facilities.

REMI Glossary

Disposable Personal Income: Total after-tax income received by persons; it is the income available to persons for spending or saving.

Economic Output: The amount of production, including all intermediate goods purchased as well as value added (compensation and profit). This can also be thought of as sales or supply.

Employment: Employment comprises estimates of the number of jobs, full-time plus part-time, by place of work for all industries.

GDP: Gross Domestic Product. The market value of goods and services produced by labor and property. It is also the sum of value-added across all industries.

Personal Income: Income received by persons from all sources. It is the sum of wages and salaries, supplements to wages and salaries, proprietors' income, rental income, asset income, and personal current transfer receipts, net of contributions for government social insurance.

Introduction

Micron Technology, Inc., is considering a project to construct, fit-out, and equip several large facilities, in Onondaga County, New York. The company would ramp up operations over two phases from 2025-2044 while investing approximately \$99.6 billion for capital expenditures (construction and machinery and equipment). In addition, there would be infrastructure (utility construction) and other investments of \$1.5 billion.

Ongoing direct employment in the facility would be 9,005 jobs as of 2045, and it would be accompanied by ongoing employment of about 5,772 in-state resident and 1,924 out-of-state visiting contractors as of 2036.

On behalf of Empire State Development (ESD), Regional Economic Models, Inc. (REMI) performed an economic and fiscal impact analysis of the facility at the state and local levels over the period 2025-2055 using a New York-specific Tax-PI model. Specifically, REMI considered how the capital expenditures, facility operations, and contractors would affect employment, economic output, Gross Domestic Product (GDP), disposable personal income, state government revenue, and local government revenue for New York and the Central New York model region in which Onondaga County is located.

REMI found strong positive economic and fiscal impacts, driven largely by the highly productive and well-compensated facility employees who create significant supply chain demand and spend robustly in the local economy. These include an average annual employment increase of 45,418 jobs, with almost 40,000 in Central New York and an associated state-level multiplier over four, an average annual increase in real economic output and real state GDP of over \$16 billion and \$9 billion respectively, an average annual increase of almost 60,000 in population, an average annual increase of more than \$5 billion in real disposable personal income, a present value (PV) of \$7.1 billion in additional real state government revenue generated given a three percent discount rate, which is greater than the present value (PV) of the proposed New York State Incentives, and a PV of \$10.7 billion in additional real local government revenue generated, of which about 85 percent accrues in Central New York.

Methodology

In order to assess the economic and fiscal impacts of locating a semiconductor manufacturing facility in Onondaga County, New York, REMI uses ESD's currently licensed multi-region, 70-industry Tax-PI v2.5 model of New York. Onondaga County is in the Central New York model region. Tax-PI is a sophisticated dynamic regional macroeconomic, demographic, and fiscal policy model that simulates the year-by-year effects of public policy initiatives, and is widely used by state and local agencies, legislatures, universities, and other organizations and experts, both in New York and across the U.S. More detailed information is available about the model and the fiscal calibration in Appendix II.

The economic and fiscal impact of the Micron facilities on state and local economies comes from two sources. The first source is the development and construction of its facility, which is expected to last 20 years from 2025-2044. The second source of economic impact is the ongoing operations of the manufacturing facility, which includes the direct employment and compensation, ongoing R&D spending, and both in-state resident and out-of-state visiting contractors, and which is expected to commence in 2026 and ramp up until stabilizing in 2045. The capital investment and operations will both occur in two phases, with Phase 1 starting in 2025 and Phase 2 starting in 2035. The direct, indirect, and induced impacts in spending and job creation are estimated through the REMI Tax-PI model. In addition, state and local tax revenue is estimated, where totals for both New York and Central New York are reported for the latter. The analysis covers the 31-year period from 2025-2055.⁶ Unless otherwise noted, averages are calculated over the 2025-2055 period. In Appendix I, a table of nominal values (current dollars) is available.

Capital Expenditures, Infrastructure, and Others

Phase 1. Capital Expenditures are categorized as (1) Construction and (2) Machinery and Equipment. Infrastructure Expenditures are categorized as (3) Utility Construction (i.e., Water and sewer system upgrades, Infrastructure Grant, Site Development, and Façade Grant). Table 1.1a displays the spending for each category from 2025-2034 and in 2055, entered as demand for (i.e., a state GDP contribution from) the corresponding industry. For categories (1) and (3), the corresponding industry is Construction, and for category (2), it is Machinery Manufacturing. Additionally, there are Workforce Training expenditures of \$10 million per year during 2026-2034, which are counted as demand for the Educational Services industry.

⁶ Given the propensity of chip fabs to remain in operation for decades, the economic impact analysis conservatively assumes an additional 11-year operating on top of the 20-year period in which Phases 1 and 2 capital expenditures are complete. Please see section on Capital Expenditures.

Table 1.1a: Capital Expenditures, Phase 1

Spending Type	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2055	Average	2025-2034 Average
Land & Building	2.1	3.1	2.8	0.8	2.0	1.2	0.3	1.6	2.5	4.5	-	0.7	2.1
Machinery & Equipment	0.1	0.8	1.0	3.6	3.0	4.6	5.0	3.4	3.3	1.9	-	0.9	2.7
Utility Construction	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	0.0	0.1
Total	2.3	4.0	3.9	4.5	5.1	5.9	5.4	5.1	5.9	6.5	-	1.6	4.9

Note: Units in Billions of Nominal Dollars. Components may not sum to totals due to rounding.

Phase 2. Capital Expenditures are categorized as (1) Construction and (2) Machinery and Equipment. Infrastructure Expenditures are categorized as (3) Utility Construction (i.e., Water and sewer system upgrades, Infrastructure Grant, Site Development, and Façade Grant). Table 1.1b displays the spending for each category from 2035-2044, and in 2055, entered as demand for the corresponding industry, which is the same as in Phase 1. Additionally, there are Workforce Training expenditures of \$10 million in 2035, which are counted as demand for the Educational Services industry.

Table 1.1b: Capital Expenditures, Phase 2

Spending Type	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2055	Average	2035-2044 Average
Land & Building	2.1	2.9	3.4	1.7	-	-	-	-	-	-	-	0.3	1.0
Machinery & Equipment	5.0	4.5	4.2	4.9	5.7	5.0	4.6	2.7	2.7	2.7	-	1.4	4.2
Utility Construction	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	0.0	0.0
Total	7.0	7.5	7.5	6.6	5.7	5.0	4.6	2.7	2.7	2.7	-	1.7	5.2

Note: Units in Billions of Nominal Dollars. Components may not sum to totals due to rounding.

Operations

Direct employment for Engineers, Quality Engineers, and Technicians, classified in the Semiconductor and related device manufacturing industry, would ramp up over 20 years starting in 2026, after which it would remain constant at 8,211. Table 1.2 displays this direct employment from 2026-2030 and 2036-2040, and in 2055, the final analysis year.

Table 1.2: Direct Employment – Semiconductor and related device manufacturing

Variable	2026	2027	2028	2029	2030	2036	2037	2038	2039	2040	2055	Average
Employment	1,570	2,381	2,979	3,685	4,223	6,488	7,021	7,426	7,558	7,825	8,211	6,271

Note: Units in Jobs. Components may not sum to totals due to rounding.

The R&D spending would ramp up to an annual value of \$301.3 million by 2045, growing by the projected inflation rate thereafter. Table 1.3 displays the spending in R&D from 2026-2030 and 2035-2039, and in 2055, the final analysis year.

Table 1.3: Direct Employment and Spending, Professional, scientific, and technical services

Variable	2026	2027	2028	2029	2030	2035	2036	2037	2038	2039	2055	Average
Spending	2.6	4.9	7.3	16.3	31.3	161.5	185.7	216.8	234.9	241.0	367.6	213.5

Note: Units for Spending in Millions of Nominal Dollars. Components may not sum to totals due to rounding.

Direct employment for Management, classified in the Management of companies and enterprises industry, would ramp up over 20 years starting in 2026, after which it would remain constant at 610. Table 1.4a displays this direct employment from 2026-2030 and 2036-2040, and in 2055, the final analysis year.

Table 1.4: Direct Employment – Management of companies and enterprises

Variable	2026	2027	2028	2029	2030	2036	2037	2038	2039	2040	2055	Average
Employment	208	326	320	273	314	482	521	552	562	581	610	477

Note: Units in Jobs. Components may not sum to totals due to rounding.

Direct employment in Administrative / Other Management, classified in the Administrative and support services industry, would ramp up over 20 years starting in 2026, after which it would remain constant at 184. Table 1.5 displays this direct employment from 2026-2030 and 2036-2040, and in 2055, the final analysis year.

Table 1.5: Direct Employment – Administrative and support services

Variable	2026	2027	2028	2029	2030	2036	2037	2038	2039	2040	2055	Average
Employment	94	125	122	82	95	146	156	166	169	174	184	146

Note: Units in Jobs. Components may not sum to totals due to rounding.

Contractors

The number of contractors would remain constant at 4,000 from 2026-2035, grow to 7,697 in 2036, and remain constant afterwards. Table 1.6 displays the numbers of contractors by location and industry in 2026, 2036, and 2055, the final analysis year.

Table 1.6: Contractor Employment

Industry	2026	2036	2055	Average
<i>In-State Contractors</i>				
Semiconductor machinery manufacturing	2,000	4,079	4,079	3,277
Services to buildings and dwellings	1,000	1,693	1,693	1,415
<i>Out-of-State Contractors</i>				
Semiconductor machinery manufacturing	1,000	1,924	1,924	1,564

Note: Units in Jobs. Components may not sum to totals due to rounding.

Aggregate out-of-state visiting contractor consumer spending during on-site would be \$97.5 million in 2026, growing by the projected inflation rate from 2026-2035. The number would rise to \$229.5 million in 2036, and would grow by the projected inflation rate thereafter. Table 1.7 displays the contractor consumer spending by category in 2026, 2036, and 2055, the final analysis year.

Table 1.7: Out-of-State Visiting Contractor Consumer Spending

Commodity	2026	2036	2055	Average
Accommodations	65.0	153.0	223.3	143.1
Purchased meals and beverages	19.5	45.9	67.0	42.9
Ground transportation	13.0	30.6	44.7	28.6

Note: Units in Millions of Nominal Dollars. Components may not sum to totals due to rounding.

Results

This section reports the economic and fiscal impacts of the Micron facilities on New York and Central New York over the period 2025-2055, specifically on employment, economic output, GDP, personal income, disposable personal income, and state and local government revenue.

Employment

Table 2.1 displays the employment impacts for New York and Central New York, including both the totals and breakdowns into direct, indirect, and induced impacts, from 2025-2029, from 2035-2039, and in 2055. During 2025-2055, the average total employment impact in New York is an increase of 45,418 jobs, with 39,975 occurring in Central New York. The average number of new direct jobs in the state is 11,182, implying an employment multiplier of approximately 4.1.

Table 2.1: Employment Impacts (New York & Central New York)

Category	2025	2026	2027	2028	2029	2035	2036	2037	2038	2039	2055	Average
<i>New York</i>												
Employment	15,468	40,272	40,268	30,724	38,260	38,829	58,961	61,989	55,611	48,511	50,911	45,418
Direct	8,992	15,229	14,680	8,217	13,018	13,033	17,696	19,297	14,640	9,763	9,005	11,182
Direct Operation	-	1,872	2,832	3,421	4,040	4,680	7,116	7,698	8,144	8,289	9,005	6,894
Indirect	1,436	6,534	6,428	5,589	6,225	6,336	10,701	10,888	10,349	9,774	9,431	8,294
Induced	5,040	18,510	19,160	16,918	19,016	19,460	30,564	31,804	30,622	28,975	32,474	25,943
<i>Central New York</i>												
Employment	14,367	36,293	36,236	26,069	33,406	33,821	52,007	55,071	48,782	41,798	44,943	39,975
Direct	8,964	15,085	14,505	7,650	12,557	12,455	17,187	18,849	14,132	9,196	9,005	10,922
Direct Operation	-	1,872	2,832	3,421	4,040	4,680	7,116	7,698	8,144	8,289	9,005	6,894
Indirect	1,281	6,251	6,152	5,380	5,951	6,037	10,327	10,496	10,017	9,507	9,231	8,047
Induced	4,121	14,957	15,579	13,040	14,898	15,329	24,493	25,727	24,633	23,095	26,707	21,006

Note: Units in Jobs. Components may not sum to totals due to rounding.

Economic Output & Gross Domestic Product

Table 2.2 displays the real economic output and real GDP impacts for New York and Central New York from 2025-2039, from 2035-2039, and in 2055. During 2025-2055, the average economic output and GDP impacts in New York are increases of \$16.7 billion and \$9.6 billion respectively. For Central New York, the corresponding impacts are \$14.9 billion and \$8.6 billion. Central New York accounts for about 90 percent of the economic output impact and 90 percent of the GDP impact. This is driven by the aforementioned high productivity of the semiconductor manufacturing facility employees, generating a sizable economic footprint in the state relative to their employment presence.

Table 2.2: Economic Output & Gross Domestic Product Impacts (New York & Central New York)

Variable	2025	2026	2027	2028	2029	2035	2036	2037	2038	2039	2055	Average
<i>New York</i>												
Output	2.8	10.2	10.5	9.4	11.0	12.0	19.4	20.3	19.4	18.4	22.8	16.7
GDP	1.6	5.6	5.9	5.2	6.2	6.9	11.0	11.6	11.2	10.5	13.2	9.6
<i>Central New York</i>												
Output	2.6	9.1	9.5	8.1	9.6	10.4	17.3	18.2	17.3	16.2	20.7	14.9
GDP	1.5	5.0	5.3	4.5	5.4	6.1	9.9	10.5	10.0	9.4	11.9	8.6

Note: Units in Billions of 2025 Dollars. Components may not sum to totals due to rounding.

Population

Table 2.3 displays the population impacts for New York and Central New York from 2025-2029, from 2035-2039, and in 2055. During 2025-2055, the average population impact in New York is 59,575, with 53,388 accruing in Central New York. This is primarily driven by the economic migrants⁷ flowing into the region, largely due to the expanded availability of high compensation jobs.

Table 2.3: Population Impacts (New York & Central New York)

Variable	2025	2026	2027	2028	2029	2035	2036	2037	2038	2039	2055	Average
<i>New York</i>												
Population	4,285	14,112	21,178	24,212	29,216	48,429	56,050	62,791	66,605	68,072	84,530	59,575
<i>Central New York</i>												
Population	4,056	12,992	19,368	21,607	26,038	43,203	50,094	56,278	59,595	60,642	76,264	53,388

Note: Units in Individuals. Components may not sum to totals due to rounding.

⁷ Economic migration is net population movement into (or out of) a region driven by a change in economic conditions such as job availability, compensation, cost of living, or taxes.

Personal Income & Disposable Personal Income

Table 2.4 displays the real personal income and real disposable personal income impacts for New York and Central New York from 2025-2029, from 2035-2039, and in 2055. During 2025-2055, the average personal income impact in New York is \$6.8 billion, with \$5.8 billion accruing in Central New York; the average disposable personal income impact in New York is \$5.4 billion, with \$4.7 billion accruing in Central New York. This is primarily driven by the high compensation of the direct employees, as well as the additional labor income earned in the many spillover jobs generated in other industries.

Table 2.4: Personal Income & Disposable Personal Income Impacts (New York & Central New York)

Variable	2025	2026	2027	2028	2029	2035	2036	2037	2038	2039	2055	Average
<i>New York</i>												
Personal Income	1.1	3.5	3.8	3.3	3.9	4.9	7.1	7.7	7.4	7.1	10.3	6.8
Disposable Personal Income	0.9	2.7	2.9	2.6	3.1	3.9	5.6	6.1	5.9	5.7	8.3	5.4
<i>Central New York</i>												
Personal Income	1.0	3.0	3.2	2.7	3.3	4.1	6.1	6.6	6.3	6.0	8.9	5.8
Disposable Personal Income	0.8	2.3	2.5	2.1	2.6	3.3	4.8	5.2	5.1	4.8	7.3	4.7

Note: Units in Billions of 2025 Dollars. Components may not sum to totals due to rounding.

State Government Revenue⁸

Table 2.5a displays the real state government revenue impacts for New York during 2025-2029 and 2035-2039, and in 2055. During 2025-2055, real state government revenue increases by \$378.5 million on average. Approximately 66 percent of the real revenue is from the personal income tax.

Table 2.5a: State Government Revenue

Variable	2025	2026	2027	2028	2029	2035	2036	2037	2038	2039	2055	Average
Total Revenue	17.4	110.9	230.3	237.6	219.3	329.3	329.4	443.0	463.3	443.5	544.7	378.5
Personal Income	12.7	76.9	158.3	160.4	149.5	218.6	220.9	298.9	310.3	294.3	359.1	251.5
Corporation and Business	1.8	10.9	22.4	22.7	21.1	30.9	31.3	42.3	43.9	41.6	50.8	35.6
Sales, Excise and User	2.2	19.1	41.3	46.1	40.8	68.2	65.5	86.0	92.7	92.1	115.8	78.2
Property Transfers	0.6	3.8	7.8	7.9	7.4	10.8	10.9	14.7	15.3	14.5	17.7	12.4
Other Taxes and Fees	0.0	0.3	0.6	0.6	0.5	0.8	0.8	1.0	1.1	1.0	1.2	0.9

Note: Units in Millions of 2025 Dollars. Components may not sum to totals due to rounding.

⁸ Both New York State and Onondaga County have a sales tax rate of 4.0%. Sales of equipment for manufacturing businesses are exempt from sales tax. The sales tax on purchases of construction materials and other supplies is also waived.

Table 2.5b displays the current dollar state government revenue impacts for New York during 2025-2029 and 2035-2039, and in 2055. During 2025-2055, current dollar state government revenue increases by \$17.2 billion.

Table 2.5b: State Government Revenue (Current Dollars)

Variable	2025	2026	2027	2028	2029	2035	2036	2037	2038	2039	2055	Average	Total
Total Revenue	17.6	114.5	242.9	255.9	241.1	408.3	416.6	571.5	609.7	595.2	1,002.6	555.5	17,221.5
Personal Income	12.9	79.4	166.9	172.7	164.3	271.1	279.4	385.7	408.3	394.9	661.1	368.6	11,425.3
Corporation and Business	1.8	11.2	23.6	24.4	23.2	38.4	39.5	54.6	57.8	55.9	93.5	52.1	1,616.5
Sales, Excise and User	2.2	19.7	43.5	49.6	44.9	84.6	82.9	110.9	122.0	123.6	213.1	115.4	3,576.9
Property Transfers	0.6	3.9	8.2	8.5	8.1	13.4	13.8	19.0	20.1	19.5	32.6	18.2	563.0
Other Taxes and Fees	0.0	0.3	0.6	0.6	0.6	0.9	1.0	1.3	1.4	1.4	2.3	1.3	39.7

Note: Units in Millions of Current Dollars. Components may not sum to totals due to rounding.

Local Government Revenue⁹

Table 2.6a displays the real local government revenue impacts for *All of New York* and Central New York during 2025-2029 and 2035-2039, and in 2055. During 2025-2055, local government revenue for *All of New York* increases by \$565.5 million on average. For Central New York, the corresponding impact is \$490.4 million. Approximately, 85 percent of the real local government revenue is generated from Central New York. It is important to note that the local government revenue impact reported for Central New York is the region’s contribution to the *All of New York* local government revenue based on Central New York local government tax rates.

Table 2.6a: Local Government Revenue - All of New York & Central New York

Variable	2025	2026	2027	2028	2029	2035	2036	2037	2038	2039	2055	Average
<i>All New York Local Government Revenue</i>												
Total Revenue	96.4	322.9	348.7	303.9	359.1	416.7	629.3	672.5	647.2	608.6	800.2	565.5
<i>Central New York Local Government Revenue</i>												
Total Revenue	84.9	280.1	302.2	251.7	303.4	354.7	542.8	583.0	557.7	520.1	700.1	490.4

Note: Units in Millions of 2025 Dollars. Components may not sum to totals due to rounding.

⁹ For the Micron facilities, instead of collecting real estate tax, Onondaga County will utilize a Payment in Lieu of Taxes (PILOT) agreement. From 2025 to 2055, the total PILOT payment will be \$43.7 million, or the total PILOT savings will be \$146.8 million. New York State and Onondaga County have a sales tax rate of 4.0 percent. Sales of equipment for manufacturing businesses are exempt from sales tax. The sales tax on purchases of construction materials and other supplies is also waived.

Table 2.6b displays the current dollar local government revenue impacts for *All of New York* and Central New York during 2025-2029 and 2035-2039, and in 2055. During 2025-2055, local government revenue for *All of New York* increases by \$826.1 million on average (\$25.6 billion in total). For Central New York, the corresponding impact is \$694.5 million on average (\$21.5 billion in total). Approximately, 85 percent of the current dollar local government revenue is generated from Central New York. It is important to note that the local government revenue impact reported for Central New York is the region’s contribution to the *All of New York* local government revenue based on Central New York local government tax rates. Approximately 57 percent of the Central New York local government revenue is generated in Onondaga County.

Table 2.6b: Local Government Revenue (Current Dollars) - All of New York & Central New York

Variable	2025	2026	2027	2028	2029	2035	2036	2037	2038	2039	2055	Average	Total
<i>All New York Local Government Revenue</i>													
Total Revenue	97.5	333.5	367.7	327.2	394.8	516.6	795.9	867.6	851.6	816.8	1,472.9	826.1	25,608.9
<i>Central New York Local Government Revenue</i>													
Total Revenue	83.2	280.2	308.5	262.3	322.6	425.1	663.6	727.1	709.5	675.0	1,248.9	694.5	21,529.1

Note: Units in Millions of Current Dollars. Components may not sum to totals due to rounding.

Incentives Offer Analysis: Current Dollar \$5.8 Billion, 3 Percent Discount Rate

Table 2.7 displays the real GDP, real disposable personal income, real state government revenue, and real local government revenue impacts, the real Economic Benefit, and the real New York State Incentives during 2025-2029 and 2035-2039, and in 2055. The table also displays the PV of each under a three percent discount rate. The Economic Benefit measure is defined by ESD as being the sum of the real disposable personal income, real state government revenue, and real local government revenue impacts.

During 2025-2055, the PV of the real GDP, real disposable personal income, real state government revenue, and real local government revenue impacts are \$182.5, \$101.4 billion, \$7.1 billion, and \$10.7 billion respectively, yielding a real Economic Benefit PV of \$119.2 billion. The PV of the real New York State Incentives for 2025-2055 is \$3.5 billion.

The fiscal benefit-cost ratio, which is calculated as the ratio of the PV of the real state government revenue impact to the PV of the real New York State Incentives, comes out to 2.0. The Economic Benefit ratio, which is calculated as the ratio of the PV of the real Economic Benefit to the PV of the real New York State Incentives, comes out to 33.6. The ROI real GDP ratio, which is calculated as the ratio of the PV of the real GDP impact to the PV of the real New York State incentives, comes out to 51.5.

Table 2.7: Disposable Personal Income, State Government Revenue, Local Government Revenue, Economic Benefit, New York State Incentives, Combined Phases, 3 Percent Discount Rate

Variable	2025	2026	2027	2028	2029	2035	2036	2037	2038	2039	2055	Average	PV (3%)
<i>NYS Gross Domestic Product</i>													
Total	1,616	5,579	5,854	5,178	6,184	6,890	11,042	11,645	11,184	10,548	13,183	9,601.2	182,495.9
<i>NYS Disposable Personal Income</i>													
Total	878.6	2,700.8	2,903.6	2,560.8	3,076.5	3,891.9	5,630.9	6,069.0	5,919.1	5,660.7	8,329.6	5,428.9	101,392.7
<i>NYS Government Revenue</i>													
Total	17.4	110.9	230.3	237.6	219.3	329.3	329.4	443.0	463.3	443.5	544.7	378.5	7,114.4
<i>Local Government Revenue</i>													
Total	96.4	322.9	348.7	303.9	359.1	647.2	608.6	618.1	625.8	626.3	800.2	565.5	10,727.5
<i>Economic Benefits</i>													
Total	992.3	3,134.5	3,482.6	3,102.3	3,655.0	4,868.4	6,568.8	7,130.0	7,008.3	6,730.5	9,674.4	6,373.0	119,234.6
<i>New York State Incentives</i>													
Total	-	147.5	231.0	225.3	250.4	321.7	272.6	286.7	287.6	252.1	-	150.9	3,544.3
													PV (3%)
Fiscal Benefit-Cost Ratio													2.0
Economic Benefit Ratio													33.6
ROI Real GDP Ratio													51.5

Note: Units in Millions of 2025 Dollars. Components may not sum to totals due to rounding.

Conclusion

REMI conducted an analysis of the Micron facilities on behalf of ESD to evaluate how the semiconductor manufacturing facilities would impact the New York and Central New York economies. The findings show that from 2025-2055, the average total employment impact in a given year is an increase of 45,418 jobs, with close to 90 percent occurring in Central New York. The average impact on the size of the state economy is \$16.7 billion in real economic output and \$9.6 billion in real GDP, the average impact on state population is 59,575, and the average impact on state real disposable personal income is \$5.4 billion. Importantly, the facility also generates \$378.5 million in additional real state government revenue on average, 2.5 times the value of the proposed real New York State Incentives on average (\$150.9 million), and more than \$565.5 million in additional real local government revenue statewide on average during the analysis period. Ultimately, these results point to substantial positive impacts on New York's economy and budget, supported by productive and high-paying jobs and a fostering of further growth in the semiconductor manufacturing ecosystem in the state.

Appendix I: Supplemental Tables

Incentives Offer Analysis: Current Dollar \$5.8 Billion, 6 Percent Discount Rate

Table 3.1 displays the real GDP, real disposable personal income, real state government revenue, and real local government revenue impacts, the real Economic Benefit, and the real New York State Incentives during 2025-2029 and 2035-2039, and in 2055. The table also displays the PV of each under a six percent discount rate. The Economic Benefit measure is defined by ESD as being the sum of the real disposable personal income, real state government revenue, and real local government revenue impacts.

During 2025-2055, the PV of the real GDP, real disposable personal income, real state government revenue, and real local government revenue impacts are \$120.3, \$65.7 billion, \$4.6 billion, and \$7.1 billion respectively, yielding a real Economic Benefit PV of \$77.4 billion. The PV of the real New York State Incentives for 2025-2055 is \$2.8 billion.

The fiscal benefit-cost ratio, which is calculated as the ratio of the PV of the real state government revenue impact to the PV of the real New York State Incentives, comes out to 1.7. The Economic Benefit ratio, which is calculated as the ratio of the PV of the real Economic Benefit to the PV of the real New York State Incentives, comes out to 28.0. The ROI real GDP ratio, which is calculated as the ratio of the PV of the real GDP impact to the PV of the real New York State incentives, comes out to 43.5.

Table 3.1: Disposable Personal Income, State Government Revenue, Local Government Revenue, Economic Benefit, New York State Incentives, Combined Phases, 6 Percent Discount Rate

Variable	2025	2026	2027	2028	2029	2035	2036	2037	2038	2039	2055	Average	PV (6%)
<i>NYS Gross Domestic Product</i>													
Total	1,616	5,579	5,854	5,178	6,184	6,890	11,042	11,645	11,184	10,548	13,183	9,601.2	120,311.6
<i>NYS Disposable Personal Income</i>													
Total	878.6	2,700.8	2,903.6	2,560.8	3,076.5	3,891.9	5,630.9	6,069.0	5,919.1	5,660.7	8,329.6	5,428.9	65,722.1
<i>NYS Government Revenue</i>													
Total	17.4	110.9	230.3	237.6	219.3	329.3	329.4	443.0	463.3	443.5	544.7	378.5	4,689.9
<i>Local Government Revenue</i>													
Total	96.4	322.9	348.7	303.9	359.1	647.2	608.6	618.1	625.8	626.3	800.2	565.5	7,061.9
<i>Economic Benefits</i>													
Total	992.3	3,134.5	3,482.6	3,102.3	3,655.0	4,868.4	6,568.8	7,130.0	7,008.3	6,730.5	9,674.4	6,373.0	77,473.9
<i>New York State Incentives</i>													
Total	119.3	120.8	138.8	175.8	111.4	165.2	169.9	58.7	58.5	57.6	-	75.6	2,764.1
													PV (6%)
Fiscal Benefit-Cost Ratio													1.7
Economic Benefit Ratio													28.0
ROI Real GDP Ratio													43.5

Note: Units in Millions of 2025 Dollars. Components may not sum to totals due to rounding.

Current Dollar Tables

Table 3.2a: Gross Domestic Product, Economic Output, Disposable Personal Income, State Government Revenue, Local Government Revenue, Economic Benefit, New York State Incentives, Capital Expenditures

Variable	Average	Total
Gross Domestic Product	13,941.9	430,607.1
Output	24,348.5	751,975.9
Disposable Personal Income	7,774.8	240,156.0
State Revenue	555.5	17,221.5
Local Government Revenue	826.1	25,608.9
NYS Incentives	187.1	5,800.0
Capital Expenditures	3,213.0	99,603.0

Note: Units in Millions of Current Dollars. Components may not sum to totals due to rounding.

Table 3.2b: Central New York (CNY) Gross Domestic Product, Economic Output, Disposable Personal Income, Local Government Revenue, Economic Benefit

Variable	Average	Total
CNY Gross Domestic Product	12,610.4	390,923.4
CNY Output	21,867.0	677,875.9
CNY Disposable Personal Income	6,694.2	207,520.8
CNY Local Government Revenue	694.5	21,529.1

Note: Units in Millions of Current Dollars. Components may not sum to totals due to rounding.

Appendix II: REMI Model Framework & Fiscal Calibration

REMI Model Framework

Tax-PI is a structural economic, demographic, and fiscal forecasting and policy analysis model. The following core framework applies to all REMI model builds. The model integrates input-output, computable general equilibrium, econometric and economic geography methodologies. The model is dynamic, with forecasts and simulations generated on an annual basis and behavioral responses to compensation, price, and other economic factors.

The model consists of thousands of simultaneous equations with a structure that is relatively straightforward. The exact number of equations used varies depending on the extent of industry, demographic, demand, and other detail in the specific model being used. The overall structure of the model can be summarized in five major blocks: (1) Output and Demand, (2) Labor and Capital Demand, (3) Population and Labor Supply, (4) Compensation, Prices, and Costs, and (5) Market Shares. The blocks and their key interactions are shown in Figures 1 and 2.

Figure A1.1: REMI Model Linkages

REMI Model Linkages (Excluding Economic Geography Linkages)

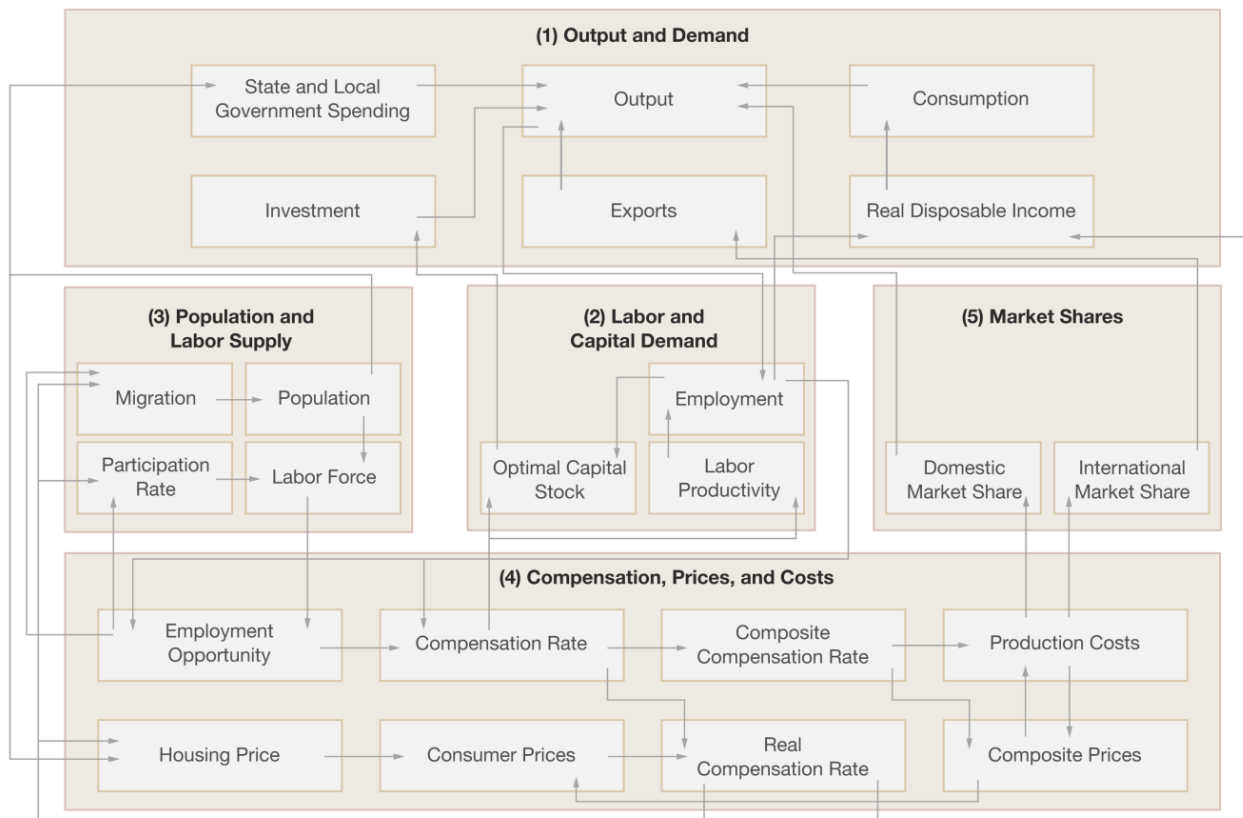
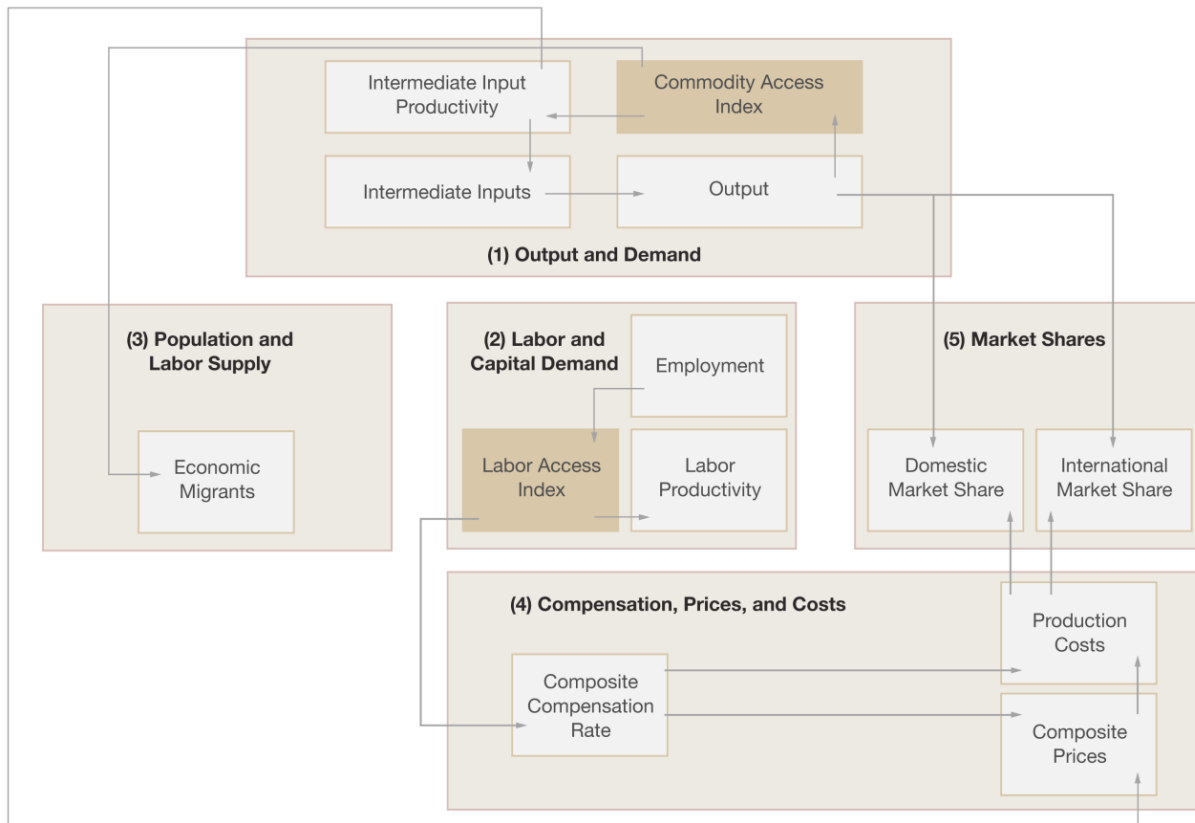


Figure A1.2: Economic Geography Linkages



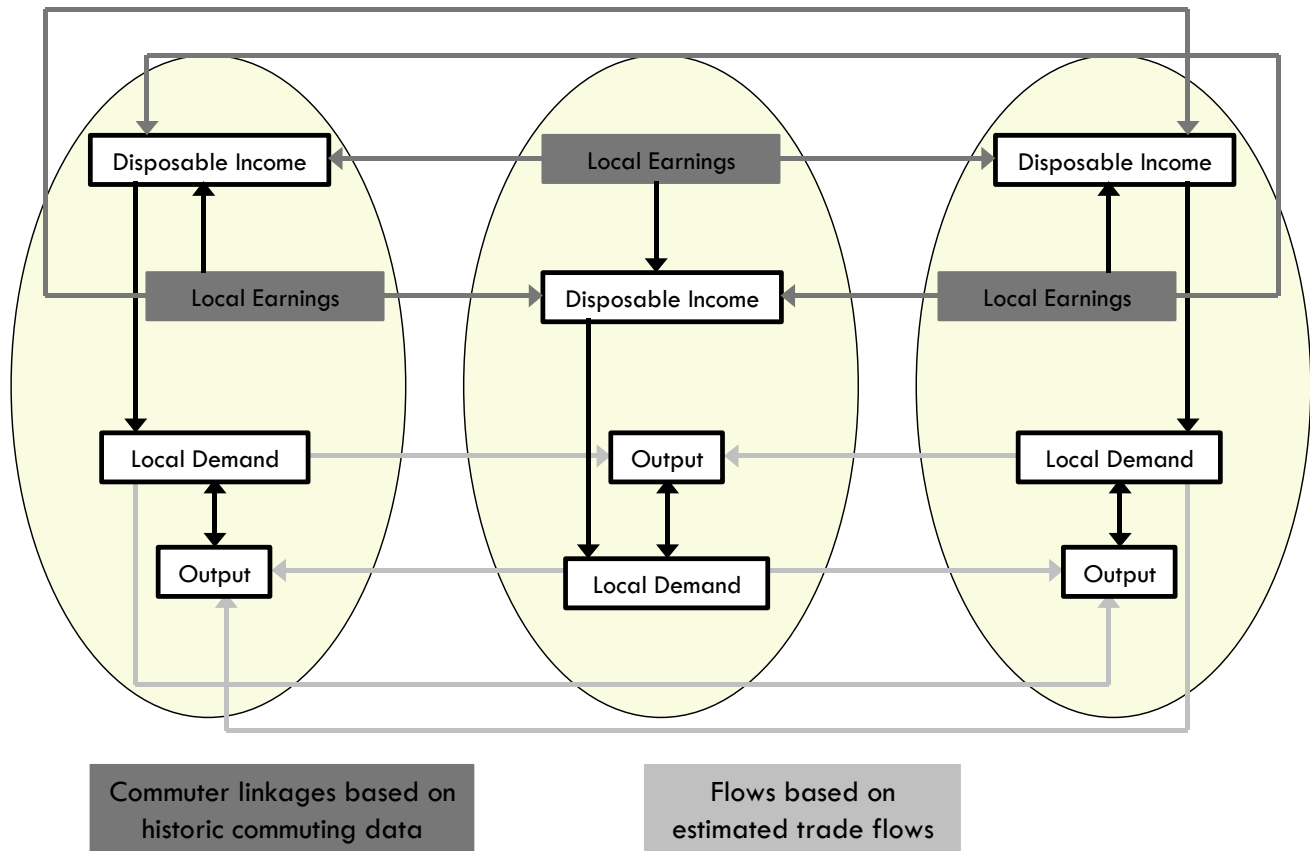
The Output and Demand block consists of output, demand, consumption, investment, government spending, exports, and imports, as well as feedback from output change due to the change in the productivity of intermediate inputs. The Labor and Capital Demand block includes labor intensity and productivity as well as demand for labor and capital. Labor force participation rate and migration equations are in the Population and Labor Supply block. The Compensation, Prices, and Costs block includes composite prices, determinants of production costs, the consumption price deflator, housing prices, and the compensation equations. The proportion of local, inter-regional, and export markets captured by each region is included in the Market Shares block.

Models can be built as single region, multi-region, or multi-region national models. A region is defined broadly as a sub-national area, and could consist of a state, province, county, or city, or any combination of sub-national areas.

Single-region models consist of an individual region, called the home region. The rest of the nation is also represented in the model. However, since the home region is only a small part of the total nation, the changes in the region do not have an endogenous effect on the variables in the rest of the nation. Multi-regional models have interactions among regions, such as trade and commuting flows. These interactions include trade flows from each region to each of the other regions. These flows are illustrated for a three-region model in Figure 3.

Figure A1.3: Trade and Commuter Flow Linkages

Trade and Commuter Flow Linkages



Multiregional national models also include a central bank monetary response that constrains labor markets. Models that only encompass a relatively small portion of a nation are not endogenously constrained by changes in exchange rates or monetary responses.

Block 1. Output and Demand

This block includes output, demand, consumption, investment, government spending, import, commodity access, and export concepts. Output for each industry in the home region is determined by industry demand in all regions in the nation, the home region's share of each market, and international exports from the region.

For each industry, demand is determined by the amount of output, consumption, investment, and capital demand on that industry. Consumption depends on real disposable income per capita, relative prices, differential income elasticities, and population. Input productivity depends on access to inputs because a larger choice set of inputs means it is more likely that the input with the specific characteristics required for the job will be found. In the capital stock adjustment process, investment occurs to fill the difference between optimal and actual capital stock for residential, non-residential, and equipment investment. Government spending changes are determined by changes in the population.

Block 2. Labor and Capital Demand

The Labor and Capital Demand block includes the determination of labor productivity, labor intensity, and the optimal capital stocks. Industry-specific labor productivity depends on the availability of workers with differentiated skills for the occupations used in each industry. The occupational labor supply and commuting costs determine firms' access to a specialized labor force.

Labor intensity is determined by the cost of labor relative to the other factor inputs, capital and fuel. Demand for capital is driven by the optimal capital stock equation for both non-residential capital and equipment. Optimal capital stock for each industry depends on the relative cost of labor and capital, and the employment weighted by capital use for each industry. Employment in private industries is determined by the value added and employment per unit of value added in each industry.

Block 3. Population and Labor Supply

The Population and Labor Supply block includes detailed demographic information about the region. Population data is given for age, gender, and race, with birth and survival rates for each group. The size and labor force participation rate of each group determines the labor supply. These participation rates respond to changes in employment relative to the potential labor force and to changes in the real after-tax compensation rate. Migration includes retirement, military, international, and economic migration. Economic migration is determined by the relative real after-tax compensation rate, relative employment opportunity, and consumer access to variety.

Block 4. Compensation, Prices and Costs

This block includes delivered prices, production costs, equipment cost, the consumption deflator, consumer prices, the price of housing, and the compensation equation. Economic geography concepts account for the productivity and price effects of access to specialized labor, goods, and services.

These prices measure the price of the industry output, taking into account the access to production locations. This access is important due to the specialization of production that takes place within each industry, and because transportation and transaction costs of distance are significant. Composite prices for each industry are then calculated based on the production costs of supplying regions, the effective distance to these regions, and the index of access to the variety of outputs in the industry relative to the access by other uses of the product.

The cost of production for each industry is determined by the cost of labor, capital, fuel, and intermediate inputs. Labor costs reflect a productivity adjustment to account for access to specialized labor, as well as underlying compensation rates. Capital costs include costs of non-residential structures and equipment, while fuel costs incorporate electricity, natural gas, and residual fuels.

The consumption deflator converts industry prices to prices for consumption commodities. For potential migrants, the consumer price is additionally calculated to include housing prices. Housing prices change from their initial level depending on changes in income and population density.

Compensation changes are due to changes in labor demand and supply conditions and changes in the national compensation rate. Changes in employment opportunities relative to the labor force and occupational demand change determine compensation rates by industry.

Block 5. Market Shares

The market shares equations measure the proportion of local and export markets that are captured by each industry. These depend on relative production costs, the estimated price elasticity of demand, and the effective distance between the home region and each of the other regions. The change in share of a specific area in any region depends on changes in its delivered price and the quantity it produces compared with the same factors for competitors in that market. The share of local and external markets then drives the exports from and imports to the home economy.

Fiscal Calibration

Each Tax-PI budget category is assigned an “Economic Indicator” that allows it to respond to changes in a specific economic variable (e.g., Personal Income for Personal Income Tax Revenue). Because the Tax-PI model integrates the economic outlook into fiscal projections, this analysis captures the interaction between economic activity and the level of tax revenue.