

Rockford University Economic Impact Analysis

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AN ENGINE FOR COLLABORATION
IN NORTHERN ILLINOIS

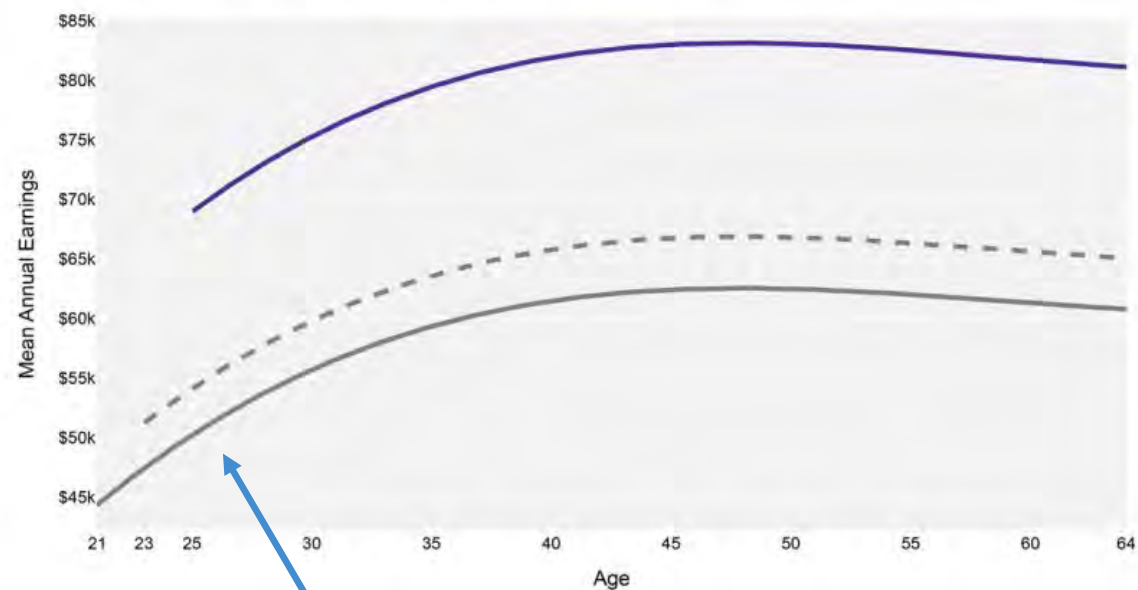


Study Overview

- Student Returns to Education: Return on Investment (ROI) Analysis
- Local Economic Impact
 - University Operations
 - Impact of Students Attending the University
 - Impact of Visitors to Rockford U
- Regional Economic Modelling
 - Scenario modelling (Baseline, Counterfactual and Expansion)

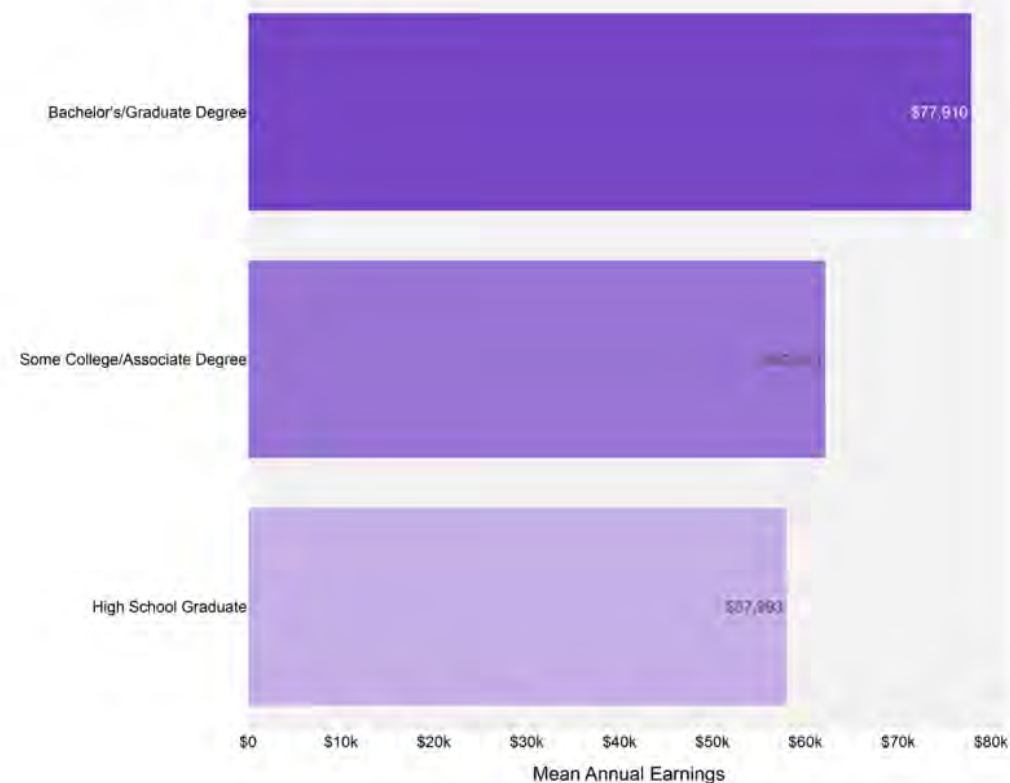
Student ROI: Modelling Overview

Figure 1.2: Regional Earnings by Age and Education Level⁷



Modelled with QWI data via polynomial regression and fit to a b-spline interpolation curve, but doesn't it seem reminiscent of the life-cycle hypothesis?

Figure 1.1: Regional Earnings by Education Level⁴



Student ROI: Theoretical Underpinnings (The Math Slide)

This analysis employs an **optimization algorithm** to adjust the earnings curve such that its calculated median salaries for two specific age groups match externally derived target median salaries by undergraduate field of study from the Census' ACS-5 database.

Solved x^* and λ with grid-search.

Objective Function

$$\min_x f(x) = \left(\text{Median}_{25 \text{ to } 39}^{\text{Model}}(x) - \text{Median}_{25 \text{ to } 39}^{\text{Target}} \right)^2 + \left(\text{Median}_{40 \text{ to } 64}^{\text{Model}}(x) - \text{Median}_{40 \text{ to } 64}^{\text{Target}} \right)^2 + \lambda \sum_{i=1}^m (C_i - C_i^{\text{orig}})^2$$

s.t.

$$\max \left(\frac{|\text{Median}_{25 \text{ to } 39}^{\text{Model}}(x^*) - \text{Median}_{25 \text{ to } 39}^{\text{Target}}|}{\text{Median}_{25 \text{ to } 39}^T}, \frac{|\text{Median}_{40 \text{ to } 64}^{\text{Model}}(x^*) - \text{Median}_{40 \text{ to } 64}^{\text{Target}}|}{\text{Median}_{40 \text{ to } 64}^T} \right) \leq 0.1$$

In plain English: Select the best position (intercept) and curvature (coefficients) for each respective major's earnings curve that minimizes the differences between the model's calculated median estimate and the targeted data from the ACS-5, subject to a (hyper-tuned) regularization parameter that penalizes curvature deviations. A viable solution has a maximum deviation of less than 10% for both the 25 to 39 and 40 to 64 age category targets.

Student ROI: Expected Value Analysis

Figure 1.3: Expected Earnings of a Rockford University Education⁸

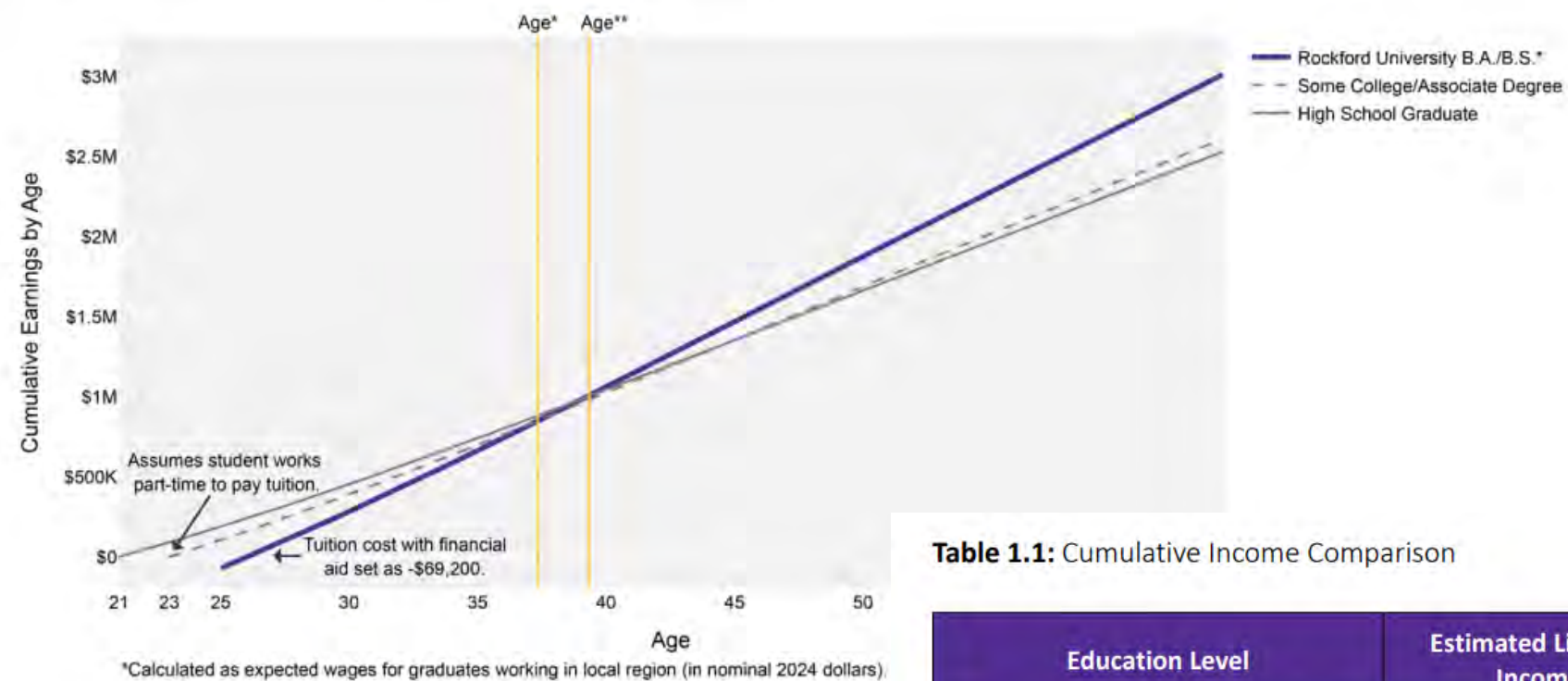


Table 1.1: Cumulative Income Comparison

Education Level	Estimated Lifetime Income	Median Income Age 25-39	Median Income Age 40-64
Rockford University B.A./B.S.*	\$3,013,513	\$75,688	\$81,518
Some College/Associate Degree	\$2,613,456	\$60,677	\$66,350
High School Graduate	\$2,530,825	\$55,690	\$62,026

*Calculated as a weighted average of Rockford University undergraduate degrees by all majors.

Student & Visitor Expenditure (2023-2024)

Table 2.3: Estimated Spending by Students Attending the University (2023-2024)

Figure 2.2: Estimated Visitors Spending (2023-2024)

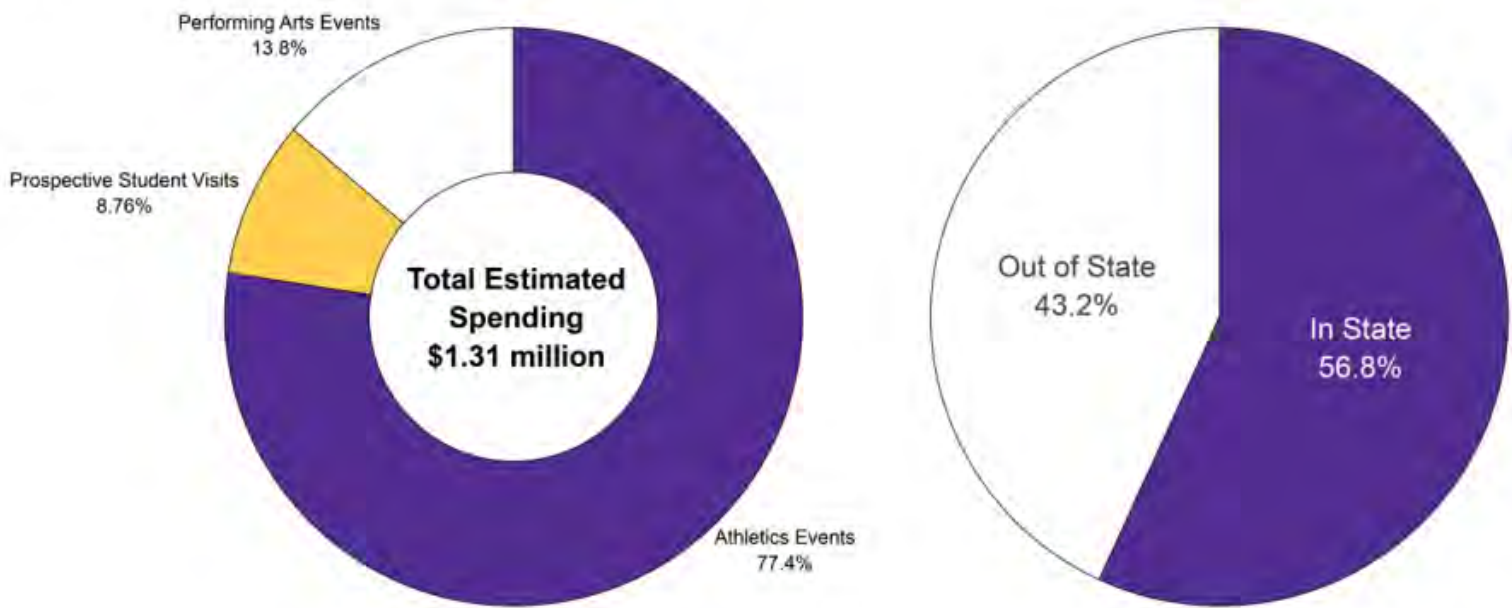


Table 2.2: Summary of RU Student Body (2023-2024)

Student Type	Full-Time	Part-Time	On-Campus	Off-Campus
Undergraduate	958	90	354	694
Graduate	98	256	25	329

Housing and Food	
On-Campus Students	\$4.1 million
Off-Campus Students	\$7.3 million
Subtotal	\$11.4 million

Transportation	
On-Campus Students	\$590,000
Off-Campus Students	\$2.2 million
Subtotal	\$2.8 million

Book, Supplies, Personal Expenses	
Subtotal	\$7.6 million

Totals & Estimated Income Generated	
Total Estimated Spending	\$21.8 million
Multiplied (Conservative estimate)	\$43.6 million
Multiplied (High Estimate)	\$78.5 million

Table 2.4: Summary of RU’s Local Economic Impact (2023-2024)

Category	Spending	Multiplied (Low)	Multiplied (High)
University Operations	\$20.2 million	\$33.4 million	\$53.6 million
Students Attending the University	\$21.8 million	\$43.6 million	\$78.5 million
Visitors	\$1.31 million	\$1.32 million	\$1.44 million
Total	\$43.3 million	\$78.3 million	\$133.5 million

Summary of REMI Inputs

Name of Input	REMI Policy Variable	2025 Input Value	
Average Capital Investment (construction)	<u>Industry Sales (Exogenous Production)</u> Detail: Construction	\$2.8 million	Winn. County
Average Expenditures (facilities & contracts)	<u>Industry Sales (Exogenous Production)</u> Detail: Waste, Repair, Laundry, Utilities	\$5.7 million	
Visitor Spending	<u>Consumer Spending</u> ; Detail: Accommodations, Food & Beverage, Recreation, Fuel, Personal Items	\$1.3 million	
Student Spending	<u>Consumer Spending</u> ; Detail: 38 details related to Housing, Food, Transportation, Books, Supplies, Personal Expenses, etc.	\$17.7 million	
RU Faculty & Staff Wage Differential	<u>Wages</u> Detail: Wage Bill: Educational services; private	\$4.7 million	
Incoming Workforce (RU Graduates)	<u>Industry Employment (Exogenous Production)</u> Detail: All Industries	202 units/people	4-County Region
Incoming Workforce Wage Differential	<u>Wages</u> Detail: Wage Bill, All Industries	\$2.9 million	



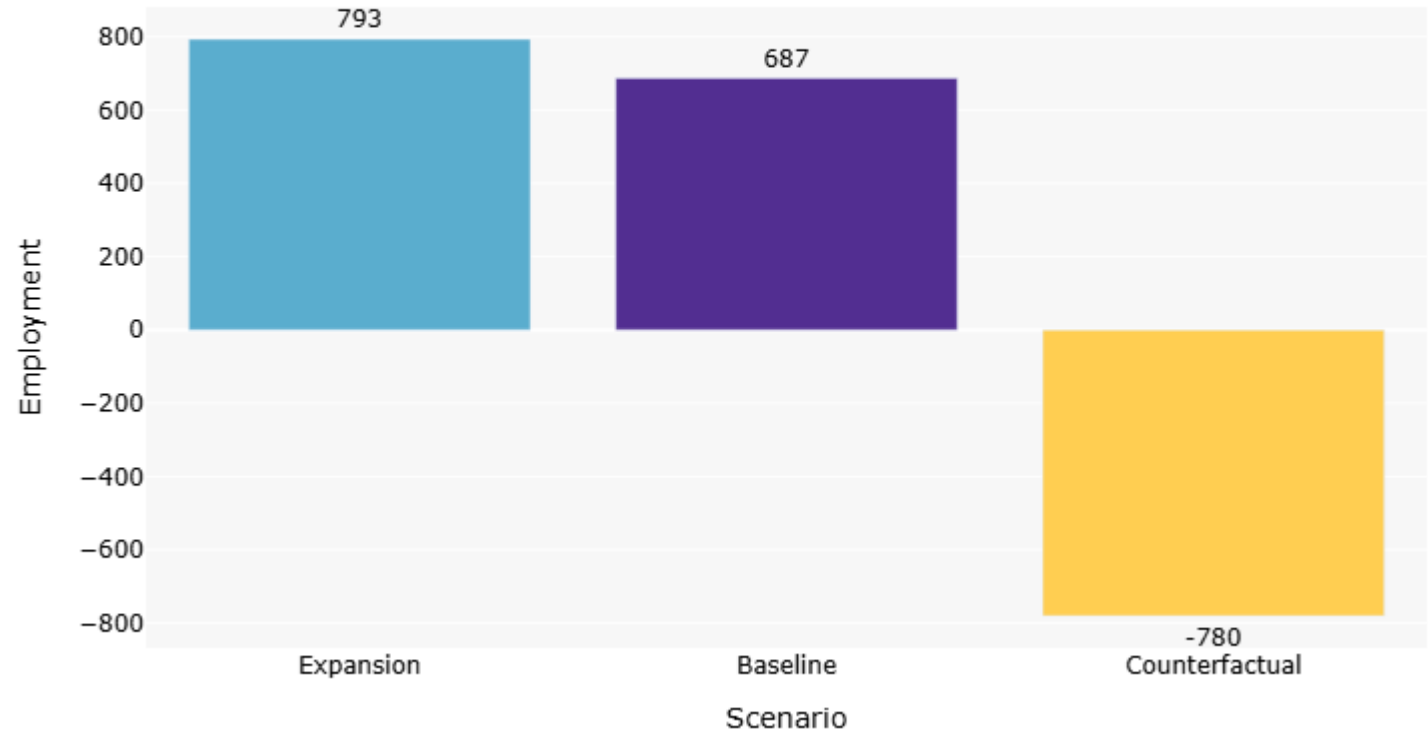
REMI Analysis

Economic impact of a single year (2025)
of RU's operations on the local economy

Scenarios

- Baseline: RU's operations as they are (numbers from previous slide).
- Expansion: If RU increased full-time enrollment numbers (~1000 to 1500). Inputs recalculated according to increased number of students.
- Counterfactual: If RU did not exist. Negative values of Baseline scenario, plus subtraction of RU staff from county workforce

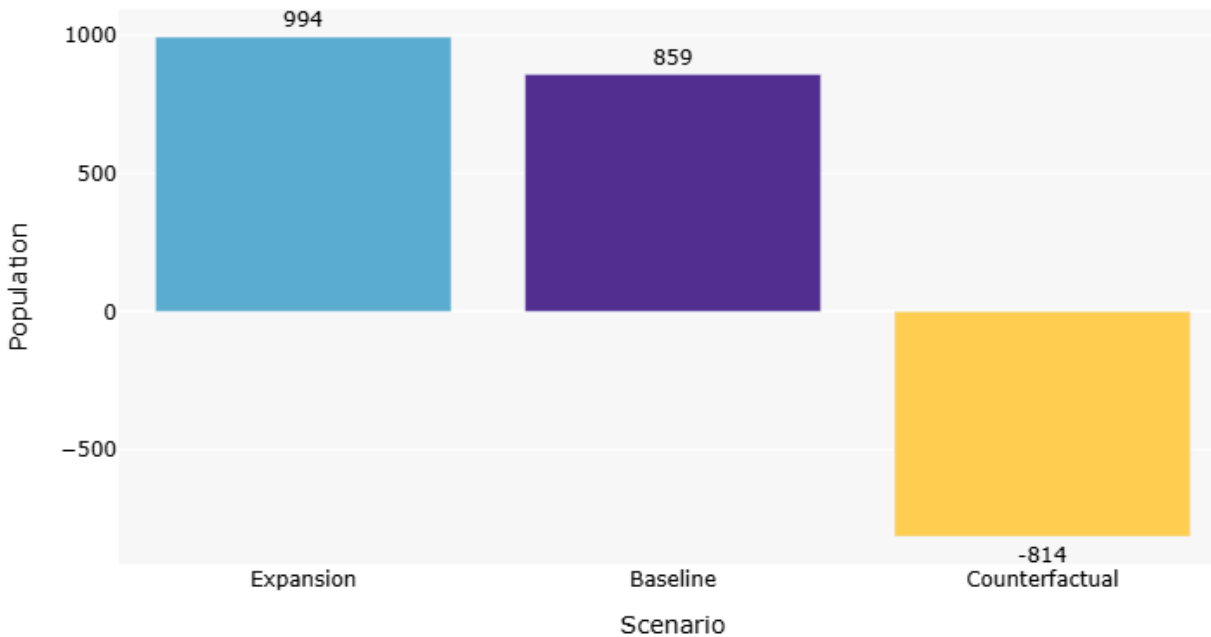
Total Impact on Employment



Cumulative over 3 years, 4-county region

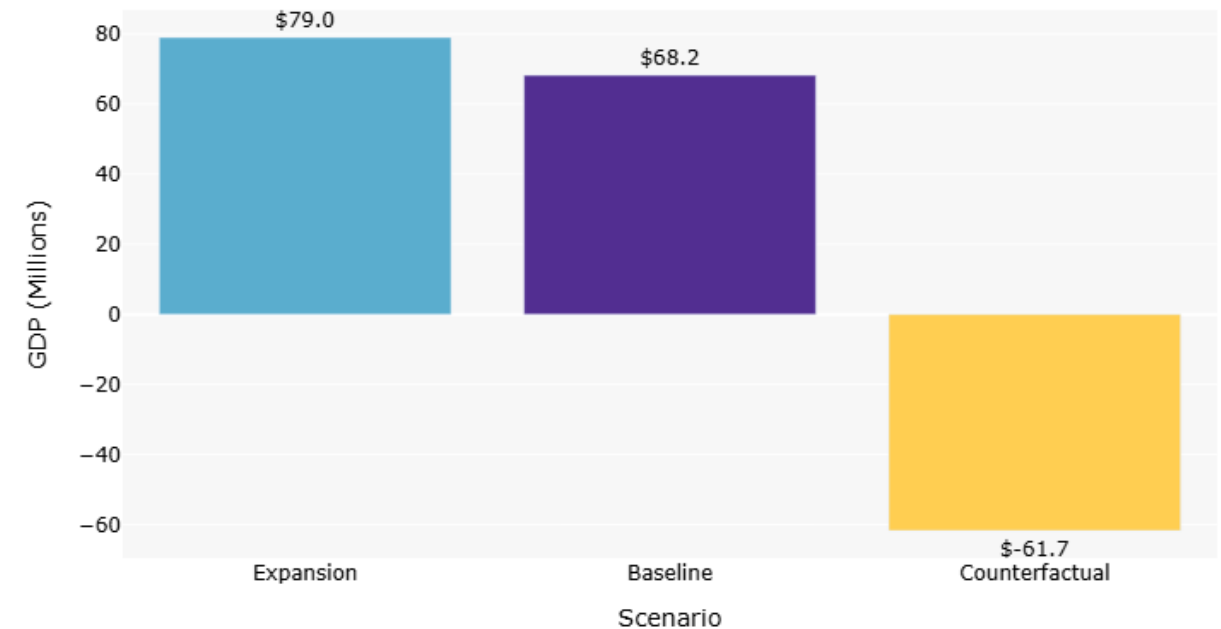
REMI Analysis

Total Impact on Population



Cumulative over 18-20 years, 4-county region

Total Impact on GDP



Cumulative over 3 years, 4-county region