

## IMPACT REPORT FOR iBUDGET ALGORITHM STUDY



October 16, 2025

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# Contents

<b>1</b>	<b>Impact Analysis</b>	<b>4</b>
1.1	Introduction . . . . .	5
1.2	Economic Impact Analysis . . . . .	5
1.2.1	Model 1: Impact Analysis . . . . .	5
1.2.2	Model 2: Impact Analysis . . . . .	7
1.2.3	Model 3: Impact Analysis . . . . .	9
1.2.4	Model 4: Impact Analysis . . . . .	11
1.2.5	Model 5: Impact Analysis . . . . .	13
1.2.6	Model 6: Impact Analysis . . . . .	15
1.2.7	Model 9: Impact Analysis . . . . .	17
1.3	Comparative Analysis Across Models . . . . .	19
1.4	Key Insights . . . . .	19

## Chapter 1

# Impact Analysis

## 1.1 Introduction

The model evaluation distinguishes three fiscal aggregates used for policy interpretation:

- **Total Actual Cost** — the sum of all observed expenditures in the historical dataset for the base year. This represents the agency’s actual fiscal outlay for waiver services and serves as the empirical baseline.
- **Total Predicted Cost** — the sum of the model’s estimated allocations for each individual, based solely on assessed need and model parameters. This reflects the theoretical distribution of funds if the predictive algorithm were implemented without any legal or policy constraints.
- **Total Compliant Budget** — this measure enforces statutory protections against reductions in individual allocations by setting each person’s projected cost to the greater of the actual and predicted values, that is,  $\text{Compliant}_i = \max(\text{Actual}_i, \text{Predicted}_i)$ . The Total Compliant Budget therefore guarantees that no participant receives less than their current level of support, ensuring compliance with legislative requirements such as F.S. 393.0662.

## 1.2 Economic Impact Analysis

This section presents the economic impact analysis for each budget allocation model. The conservative budget estimate is defined as the maximum of the actual cost and predicted cost for each case:  $\text{Conservative} = \max(\text{Actual}, \text{Predicted})$ . This approach ensures adequate funding while accounting for model uncertainty.

### 1.2.1 Model 1: Impact Analysis

Table 1.1: Model 1: Economic Impact Summary (fiscal year 2024–2025)

Metric	Value	Per Client
Sample Size	35,444	—
Total Actual Cost	\$1,680,682,853.91	\$47,417.98
Total Predicted Cost	\$1,322,238,048.82	\$37,304.99
Total Conservative Budget	\$1,908,875,018.24	\$53,856.08
<b>Economic Impact</b>	<b>\$+228,192,164.33</b>	<b>\$+6,438.10</b>
Impact Percentage	13.58%	—
Cases Over Budget	17,173	48.5%
Model $R^2$ (Test)	0.4300	—
RMSE (Test)	\$33,718.68	—

Table 1.2: Model 1: Economic Impact by Budget Quartile (fiscal year 2024–2025)

Budget Quartile	N	Mean Actual	Mean Conservative	Impact	Impact %
Q1 (Low)	8,861	\$1,815.61	\$14,048.92	\$+108,399,342.29	+971.31%
Q2	8,861	\$16,963.90	\$22,703.76	\$+50,860,912.56	+51.47%
Q3	8,861	\$57,199.58	\$62,808.44	\$+49,700,093.71	+10.28%
Q4 (High)	8,861	\$113,692.83	\$115,863.22	\$+19,231,815.77	+2.47%

Tables 1.1 through 1.3 present detailed subgroup analyses, revealing how economic impact varies across age groups, living settings, budget levels, and impact categories. These breakdowns help identify which populations are most affected by prediction errors and where conservative budgeting has the greatest effect.

Figure 1.2-1 presents the distribution analysis for Model 1, showing the distributions of actual costs, predicted costs, prediction errors, and conservative budget estimates.

Table 1.3: Model 1: Distribution by Impact Level (fiscal year 2024–2025)

Impact Level	N	%	Mean Actual	Mean Impact	Impact %
No Change	18,271	51.5%	\$71,551.35	\$+0.00	+0.00%
Small Increase (0-10%)	1,785	5.0%	\$60,779.33	\$+2,895.91	+4.86%
Moderate Increase (10-25%)	1,988	5.6%	\$54,121.24	\$+9,096.24	+17.07%
Large Increase (>25%)	13,400	37.8%	\$11,737.62	\$+15,294.00	+681.58%

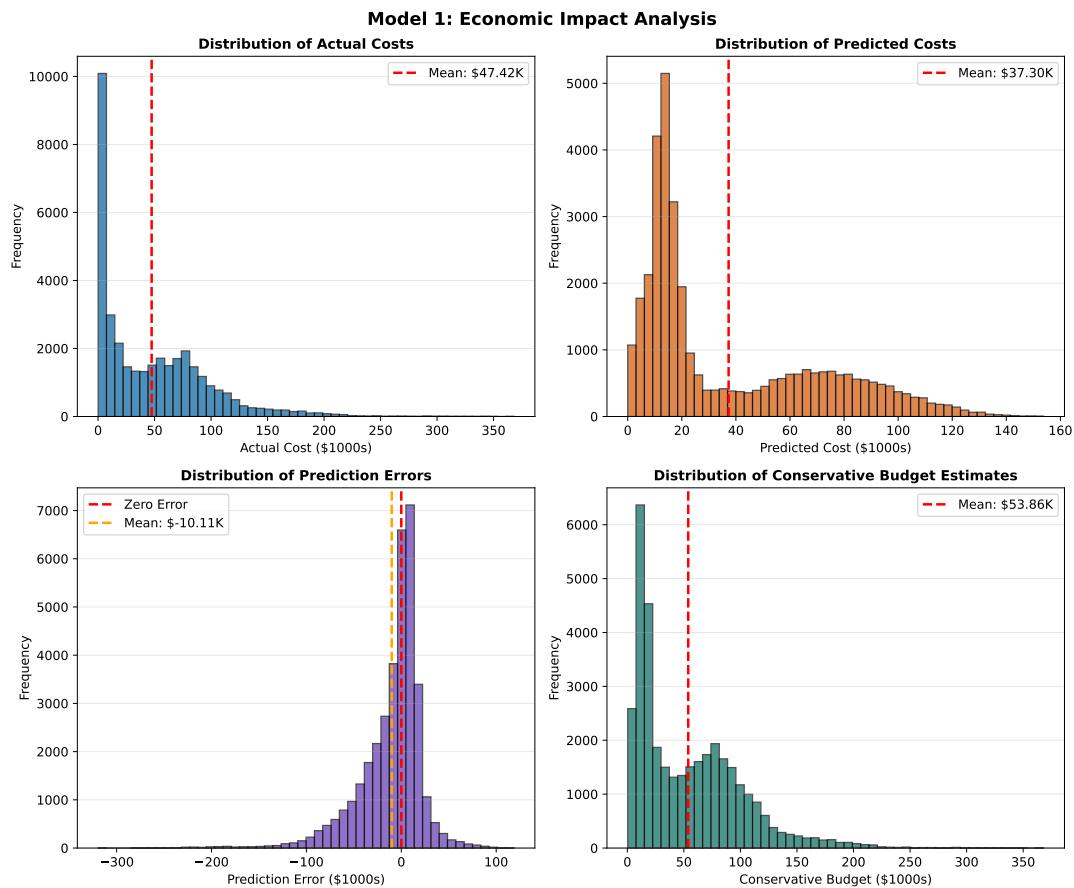


Figure 1.2-1: Model 1: Distribution of costs, predictions, errors, and conservative budget estimates. The conservative estimate takes the maximum of actual and predicted costs to ensure adequate funding (fiscal year 2024–2025).

The conservative budgeting approach for Model 1 would require an additional \$228,192,164.33 (13.58%) compared to actual costs, averaging \$6,438.10 per client. The model under-predicted costs in 48.5% of cases, necessitating the conservative approach to avoid budget shortfalls. Notably, 37.8% of cases (13,400 clients) require large budget increases exceeding 25%, highlighting the importance of the conservative approach for high-risk cases.

### 1.2.2 Model 2: Impact Analysis

Table 1.4: Model 2: Economic Impact Summary (fiscal year 2024–2025)

Metric	Value	Per Client
Sample Size	35,444	—
Total Actual Cost	\$1,680,682,853.91	\$47,417.98
Total Predicted Cost	\$1,612,314,909.62	\$45,489.08
Total Conservative Budget	\$2,078,656,644.10	\$58,646.22
<b>Economic Impact</b>	<b>\$+397,973,790.19</b>	<b>\$+11,228.24</b>
Impact Percentage	23.68%	—
Cases Over Budget	20,782	58.6%
Model $R^2$ (Test)	0.4386	—
RMSE (Test)	\$33,463.23	—

Table 1.5: Model 2: Economic Impact by Budget Quartile (fiscal year 2024–2025)

Budget Quartile	N	Mean Actual	Mean Conservative	Impact	Impact %
Q1 (Low)	8,861	\$1,815.61	\$22,145.22	\$+180,140,635.74	+1,557.13%
Q2	8,861	\$16,963.90	\$26,428.21	\$+83,863,235.56	+89.60%
Q3	8,861	\$57,199.58	\$65,389.01	\$+72,566,549.75	+14.44%
Q4 (High)	8,861	\$113,692.83	\$120,622.45	\$+61,403,369.14	+7.38%

Table 1.6: Model 2: Distribution by Impact Level (fiscal year 2024–2025)

Impact Level	N	%	Mean Actual	Mean Impact	Impact %
No Change	14,662	41.4%	\$77,734.19	\$+0.00	+0.00%
Small Increase (0-10%)	1,862	5.3%	\$64,148.83	\$+3,108.52	+4.85%
Moderate Increase (10-25%)	2,252	6.4%	\$60,998.59	\$+10,518.38	+17.26%
Large Increase (>25%)	16,668	47.0%	\$17,046.45	\$+22,108.13	+884.16%

Tables 1.4 through 1.6 present detailed subgroup analyses, revealing how economic impact varies across age groups, living settings, budget levels, and impact categories. These breakdowns help identify which populations are most affected by prediction errors and where conservative budgeting has the greatest effect.

Figure 1.2-2 presents the distribution analysis for Model 2, showing the distributions of actual costs, predicted costs, prediction errors, and conservative budget estimates.

The conservative budgeting approach for Model 2 would require an additional \$397,973,790.19 (23.68%) compared to actual costs, averaging \$11,228.24 per client. The model under-predicted costs in 58.6% of cases, necessitating the conservative approach to avoid budget shortfalls. Notably, 47.0% of cases (16,668 clients) require large budget increases exceeding 25%, highlighting the importance of the conservative approach for high-risk cases.

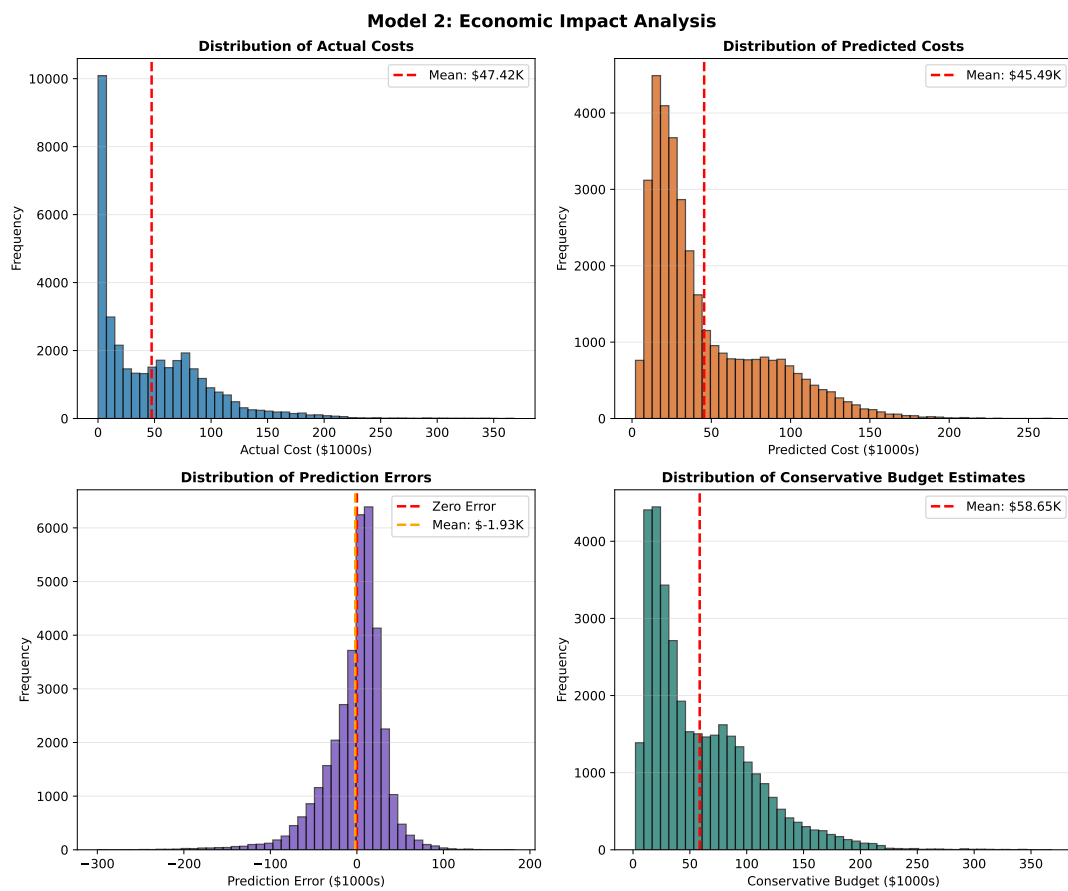


Figure 1.2-2: Model 2: Distribution of costs, predictions, errors, and conservative budget estimates. The conservative estimate takes the maximum of actual and predicted costs to ensure adequate funding (fiscal year 2024–2025).



### 1.2.3 Model 3: Impact Analysis

Table 1.7: Model 3: Economic Impact Summary (fiscal year 2024–2025)

Metric	Value	Per Client
Sample Size	35,444	—
Total Actual Cost	\$1,680,682,853.91	\$47,417.98
Total Predicted Cost	\$1,397,240,560.07	\$39,421.07
Total Conservative Budget	\$1,950,387,953.94	\$55,027.31
<b>Economic Impact</b>	<b>\$+269,705,100.03</b>	<b>\$+7,609.33</b>
Impact Percentage	16.05%	—
Cases Over Budget	17,573	49.6%
Model $R^2$ (Test)	0.4534	—
RMSE (Test)	\$33,018.58	—

Table 1.8: Model 3: Economic Impact by Budget Quartile (fiscal year 2024–2025)

Budget Quartile	N	Mean Actual	Mean Conservative	Impact	Impact %
Q1 (Low)	8,861	\$1,815.61	\$18,047.41	\$+143,829,956.85	+1,269.96%
Q2	8,861	\$16,963.90	\$24,701.80	\$+68,565,518.29	+72.13%
Q3	8,861	\$57,199.58	\$62,495.16	\$+46,924,112.97	+9.79%
Q4 (High)	8,861	\$113,692.83	\$114,864.88	\$+10,385,511.91	+1.39%

Table 1.9: Model 3: Distribution by Impact Level (fiscal year 2024–2025)

Impact Level	N	%	Mean Actual	Mean Impact	Impact %
No Change	17,871	50.4%	\$73,432.24	\$+0.00	+0.00%
Small Increase (0-10%)	1,854	5.2%	\$60,511.84	\$+2,818.21	+4.76%
Moderate Increase (10-25%)	2,014	5.7%	\$51,734.09	\$+8,593.00	+16.80%
Large Increase (>25%)	13,705	38.7%	\$11,090.40	\$+18,035.30	+871.85%

Tables 1.7 through 1.9 present detailed subgroup analyses, revealing how economic impact varies across age groups, living settings, budget levels, and impact categories. These breakdowns help identify which populations are most affected by prediction errors and where conservative budgeting has the greatest effect.

Figure 1.2-3 presents the distribution analysis for Model 3, showing the distributions of actual costs, predicted costs, prediction errors, and conservative budget estimates.

The conservative budgeting approach for Model 3 would require an additional \$269,705,100.03 (16.05%) compared to actual costs, averaging \$7,609.33 per client. The model under-predicted costs in 49.6% of cases, necessitating the conservative approach to avoid budget shortfalls. Notably, 38.7% of cases (13,705 clients) require large budget increases exceeding 25%, highlighting the importance of the conservative approach for high-risk cases.

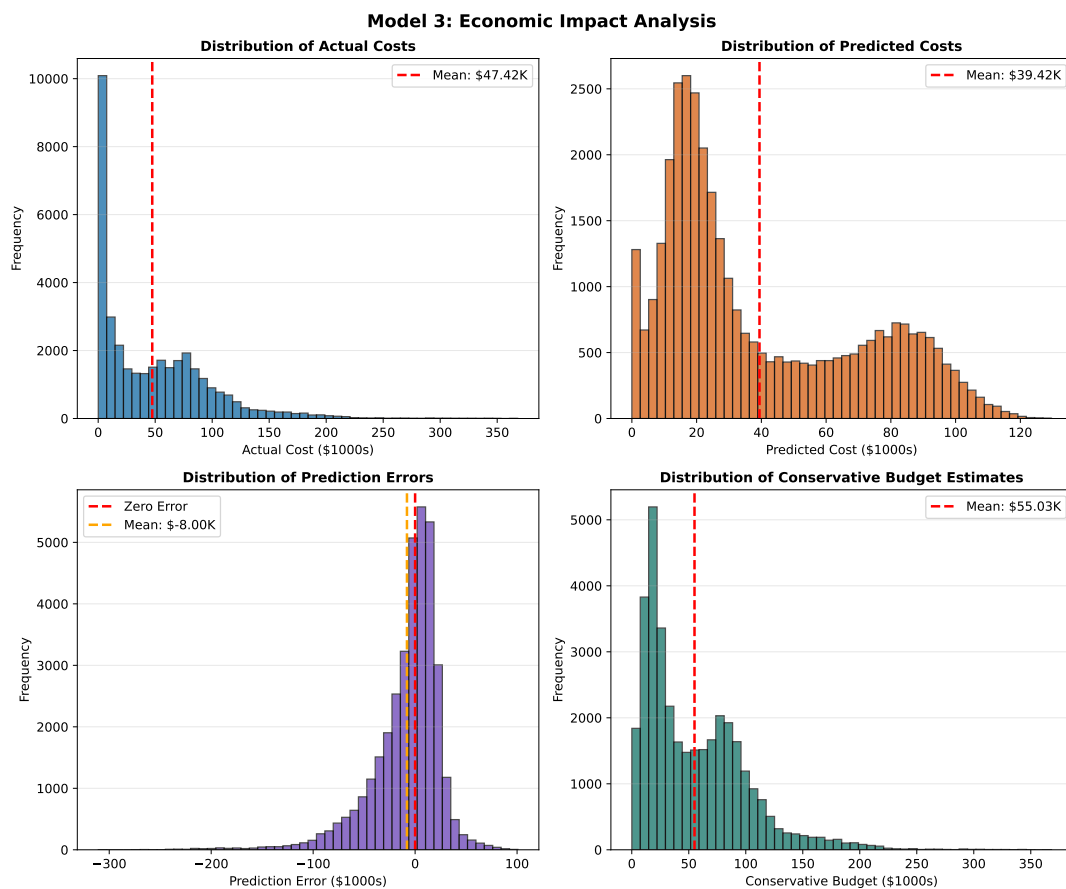


Figure 1.2-3: Model 3: Distribution of costs, predictions, errors, and conservative budget estimates. The conservative estimate takes the maximum of actual and predicted costs to ensure adequate funding (fiscal year 2024–2025).

### 1.2.4 Model 4: Impact Analysis

Table 1.10: Model 4: Economic Impact Summary (fiscal year 2024–2025)

Metric	Value	Per Client
Sample Size	35,444	—
Total Actual Cost	\$1,680,682,853.91	\$47,417.98
Total Predicted Cost	\$1,565,446,399.80	\$44,166.75
Total Conservative Budget	\$2,044,389,939.84	\$57,679.44
<b>Economic Impact</b>	<b>\$+363,707,085.93</b>	<b>\$+10,261.46</b>
Impact Percentage	21.64%	—
Cases Over Budget	19,402	54.7%
Model $R^2$ (Test)	0.4746	—
RMSE (Test)	\$32,372.08	—

Table 1.11: Model 4: Economic Impact by Budget Quartile (fiscal year 2024–2025)

Budget Quartile	N	Mean Actual	Mean Conservative	Impact	Impact %
Q1 (Low)	8,861	\$1,815.61	\$24,140.53	\$+197,821,110.74	+1,706.56%
Q2	8,861	\$16,963.90	\$28,151.37	\$+99,132,237.83	+104.10%
Q3	8,861	\$57,199.58	\$63,129.61	\$+52,546,021.21	+10.95%
Q4 (High)	8,861	\$113,692.83	\$115,296.23	\$+14,207,716.14	+1.88%

Table 1.12: Model 4: Distribution by Impact Level (fiscal year 2024–2025)

Impact Level	N	%	Mean Actual	Mean Impact	Impact %
No Change	16,042	45.3%	\$78,197.96	\$+0.00	+0.00%
Small Increase (0-10%)	1,981	5.6%	\$62,904.18	\$+2,977.48	+4.82%
Moderate Increase (10-25%)	2,087	5.9%	\$54,461.61	\$+9,188.60	+17.07%
Large Increase (>25%)	15,334	43.3%	\$12,257.51	\$+22,083.74	+1,050.79%

Tables 1.10 through 1.12 present detailed subgroup analyses, revealing how economic impact varies across age groups, living settings, budget levels, and impact categories. These breakdowns help identify which populations are most affected by prediction errors and where conservative budgeting has the greatest effect.

Figure 1.2-4 presents the distribution analysis for Model 4, showing the distributions of actual costs, predicted costs, prediction errors, and conservative budget estimates.

The conservative budgeting approach for Model 4 would require an additional \$363,707,085.93 (21.64%) compared to actual costs, averaging \$10,261.46 per client. The model under-predicted costs in 54.7% of cases, necessitating the conservative approach to avoid budget shortfalls. Notably, 43.3% of cases (15,334 clients) require large budget increases exceeding 25%, highlighting the importance of the conservative approach for high-risk cases.

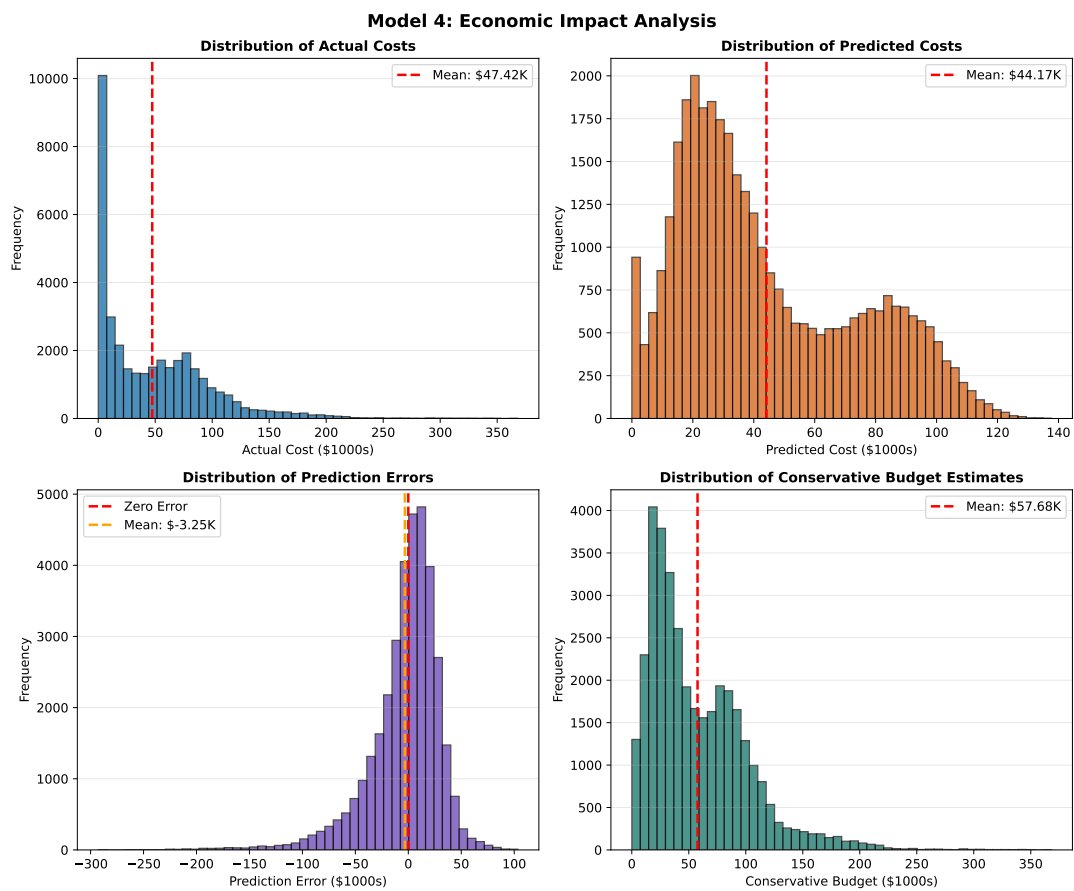


Figure 1.2-4: Model 4: Distribution of costs, predictions, errors, and conservative budget estimates. The conservative estimate takes the maximum of actual and predicted costs to ensure adequate funding (fiscal year 2024–2025).

### 1.2.5 Model 5: Impact Analysis

Table 1.13: Model 5: Economic Impact Summary (fiscal year 2024–2025)

Metric	Value	Per Client
Sample Size	35,444	—
Total Actual Cost	\$1,680,682,853.91	\$47,417.98
Total Predicted Cost	\$1,573,565,102.29	\$44,395.81
Total Conservative Budget	\$2,045,365,820.29	\$57,706.97
<b>Economic Impact</b>	<b>\$+364,682,966.38</b>	<b>\$+10,288.99</b>
Impact Percentage	21.70%	—
Cases Over Budget	19,229	54.3%
Model $R^2$ (Test)	0.4772	—
RMSE (Test)	\$32,290.80	—

Table 1.14: Model 5: Economic Impact by Budget Quartile (fiscal year 2024–2025)

Budget Quartile	N	Mean Actual	Mean Conservative	Impact	Impact %
Q1 (Low)	8,861	\$1,815.61	\$23,396.41	\$+191,227,475.51	+1,647.56%
Q2	8,861	\$16,963.90	\$27,870.04	\$+96,639,318.51	+100.40%
Q3	8,861	\$57,199.58	\$63,736.67	\$+57,925,155.64	+11.98%
Q4 (High)	8,861	\$113,692.83	\$115,824.76	\$+18,891,016.72	+2.48%

Table 1.15: Model 5: Distribution by Impact Level (fiscal year 2024–2025)

Impact Level	N	%	Mean Actual	Mean Impact	Impact %
No Change	16,215	45.7%	\$75,722.29	\$+0.00	+0.00%
Small Increase (0-10%)	1,969	5.6%	\$65,207.00	\$+3,175.14	+4.92%
Moderate Increase (10-25%)	2,221	6.3%	\$56,633.60	\$+9,562.80	+17.08%
Large Increase (>25%)	15,039	42.4%	\$13,210.33	\$+22,421.18	+1,035.26%

Tables 1.13 through 1.15 present detailed subgroup analyses, revealing how economic impact varies across age groups, living settings, budget levels, and impact categories. These breakdowns help identify which populations are most affected by prediction errors and where conservative budgeting has the greatest effect.

Figure 1.2-5 presents the distribution analysis for Model 5, showing the distributions of actual costs, predicted costs, prediction errors, and conservative budget estimates.

The conservative budgeting approach for Model 5 would require an additional \$364,682,966.38 (21.70%) compared to actual costs, averaging \$10,288.99 per client. The model under-predicted costs in 54.3% of cases, necessitating the conservative approach to avoid budget shortfalls. Notably, 42.4% of cases (15,039 clients) require large budget increases exceeding 25%, highlighting the importance of the conservative approach for high-risk cases.

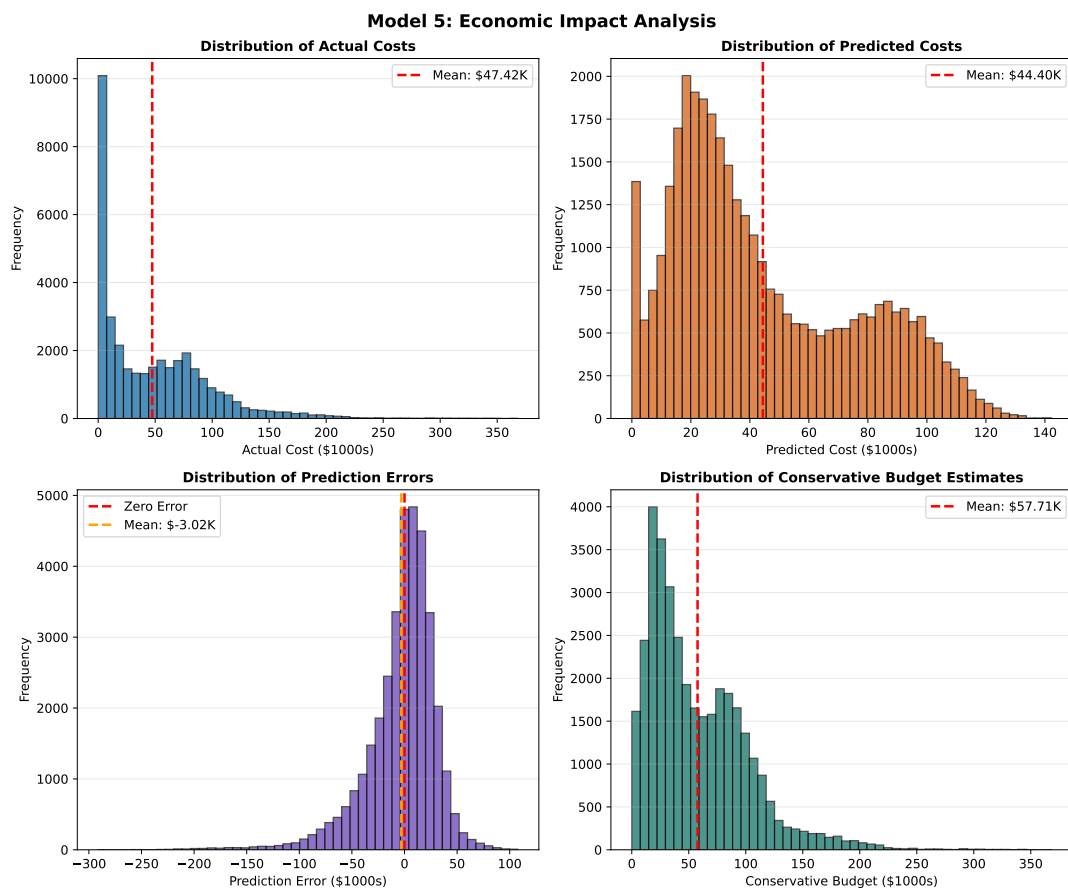


Figure 1.2-5: Model 5: Distribution of costs, predictions, errors, and conservative budget estimates. The conservative estimate takes the maximum of actual and predicted costs to ensure adequate funding (fiscal year 2024–2025).

### 1.2.6 Model 6: Impact Analysis

Table 1.16: Model 6: Economic Impact Summary (fiscal year 2024–2025)

Metric	Value	Per Client
Sample Size	35,444	—
Total Actual Cost	\$1,680,682,853.91	\$47,417.98
Total Predicted Cost	\$2,168,063,052.31	\$61,168.69
Total Conservative Budget	\$2,551,176,818.24	\$71,977.68
<b>Economic Impact</b>	<b>\$+870,493,964.33</b>	<b>\$+24,559.70</b>
Impact Percentage	51.79%	—
Cases Over Budget	24,153	68.1%
Model $R^2$ (Test)	-0.3517	—
RMSE (Test)	\$51,923.33	—

Table 1.17: Model 6: Economic Impact by Budget Quartile (fiscal year 2024–2025)

Budget Quartile	N	Mean Actual	Mean Conservative	Impact	Impact %
Q1 (Low)	8,861	\$1,815.61	\$19,022.50	\$+152,470,243.96	+1,326.71%
Q2	8,861	\$16,963.90	\$28,400.50	\$+101,339,752.86	+96.51%
Q3	8,861	\$57,199.58	\$86,599.32	\$+260,511,116.53	+49.82%
Q4 (High)	8,861	\$113,692.83	\$153,888.39	\$+356,172,850.99	+40.77%

Table 1.18: Model 6: Distribution by Impact Level (fiscal year 2024–2025)

Impact Level	N	%	Mean Actual	Mean Impact	Impact %
No Change	11,291	31.9%	\$68,665.60	\$+0.00	+0.00%
Small Increase (0-10%)	1,123	3.2%	\$61,881.32	\$+3,189.49	+5.03%
Moderate Increase (10-25%)	1,539	4.3%	\$64,883.40	\$+11,269.98	+17.41%
Large Increase (>25%)	21,491	60.6%	\$34,248.35	\$+39,531.32	+622.65%

Tables 1.16 through 1.18 present detailed subgroup analyses, revealing how economic impact varies across age groups, living settings, budget levels, and impact categories. These breakdowns help identify which populations are most affected by prediction errors and where conservative budgeting has the greatest effect.

Figure 1.2-6 presents the distribution analysis for Model 6, showing the distributions of actual costs, predicted costs, prediction errors, and conservative budget estimates.

The conservative budgeting approach for Model 6 would require an additional \$870,493,964.33 (51.79%) compared to actual costs, averaging \$24,559.70 per client. The model under-predicted costs in 68.1% of cases, necessitating the conservative approach to avoid budget shortfalls. Notably, 60.6% of cases (21,491 clients) require large budget increases exceeding 25%, highlighting the importance of the conservative approach for high-risk cases.

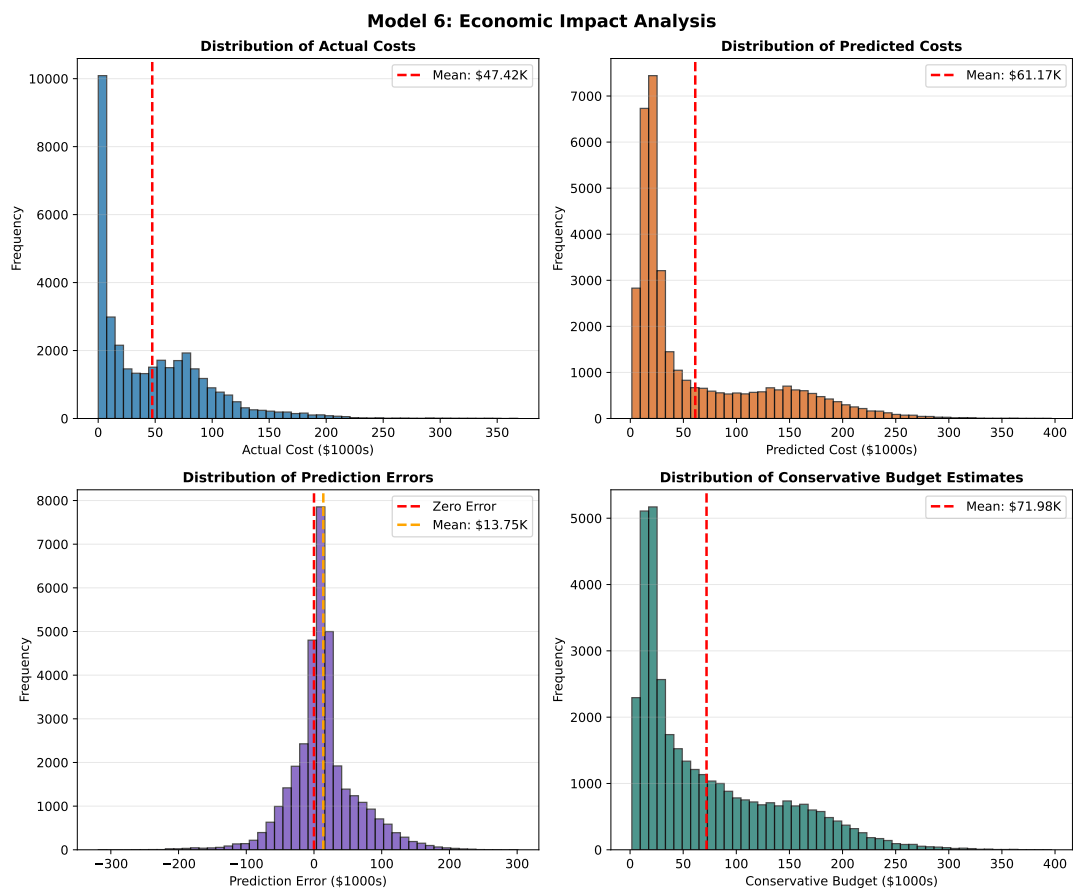


Figure 1.2-6: Model 6: Distribution of costs, predictions, errors, and conservative budget estimates. The conservative estimate takes the maximum of actual and predicted costs to ensure adequate funding (fiscal year 2024–2025).



### 1.2.7 Model 9: Impact Analysis

Table 1.19: Model 9: Economic Impact Summary (fiscal year 2024–2025)

Metric	Value	Per Client
Sample Size	35,444	—
Total Actual Cost	\$1,680,682,853.91	\$47,417.98
Total Predicted Cost	\$1,413,102,733.23	\$39,868.60
Total Conservative Budget	\$1,902,497,860.41	\$53,676.16
<b>Economic Impact</b>	<b>\$+221,815,006.50</b>	<b>\$+6,258.18</b>
Impact Percentage	13.20%	—
Cases Over Budget	16,750	47.3%
Model $R^2$ (Test)	0.6412	—
RMSE (Test)	\$24,727.15	—

Table 1.20: Model 9: Economic Impact by Budget Quartile (fiscal year 2024–2025)

Budget Quartile	N	Mean Actual	Mean Conservative	Impact	Impact %
Q1 (Low)	8,861	\$1,815.61	\$17,710.57	\$+140,845,254.66	+1,281.94%
Q2	8,861	\$16,963.90	\$23,290.13	\$+56,056,721.85	+64.17%
Q3	8,861	\$57,199.58	\$59,449.32	\$+19,934,949.20	+4.31%
Q4 (High)	8,861	\$113,692.83	\$114,254.63	\$+4,978,080.79	+0.65%

Table 1.21: Model 9: Distribution by Impact Level (fiscal year 2024–2025)

Impact Level	N	%	Mean Actual	Mean Impact	Impact %
No Change	18,694	52.7%	\$76,659.94	\$+0.00	+0.00%
Small Increase (0-10%)	1,760	5.0%	\$52,090.90	\$+2,373.54	+4.69%
Moderate Increase (10-25%)	1,546	4.4%	\$39,548.57	\$+6,561.35	+16.94%
Large Increase (>25%)	13,444	37.9%	\$7,049.97	\$+15,433.93	+887.93%

Tables 1.19 through 1.21 present detailed subgroup analyses, revealing how economic impact varies across age groups, living settings, budget levels, and impact categories. These breakdowns help identify which populations are most affected by prediction errors and where conservative budgeting has the greatest effect.

Figure 1.2-7 presents the distribution analysis for Model 9, showing the distributions of actual costs, predicted costs, prediction errors, and conservative budget estimates.

The conservative budgeting approach for Model 9 would require an additional \$221,815,006.50 (13.20%) compared to actual costs, averaging \$6,258.18 per client. The model under-predicted costs in 47.3% of cases, necessitating the conservative approach to avoid budget shortfalls. Notably, 37.9% of cases (13,444 clients) require large budget increases exceeding 25%, highlighting the importance of the conservative approach for high-risk cases.

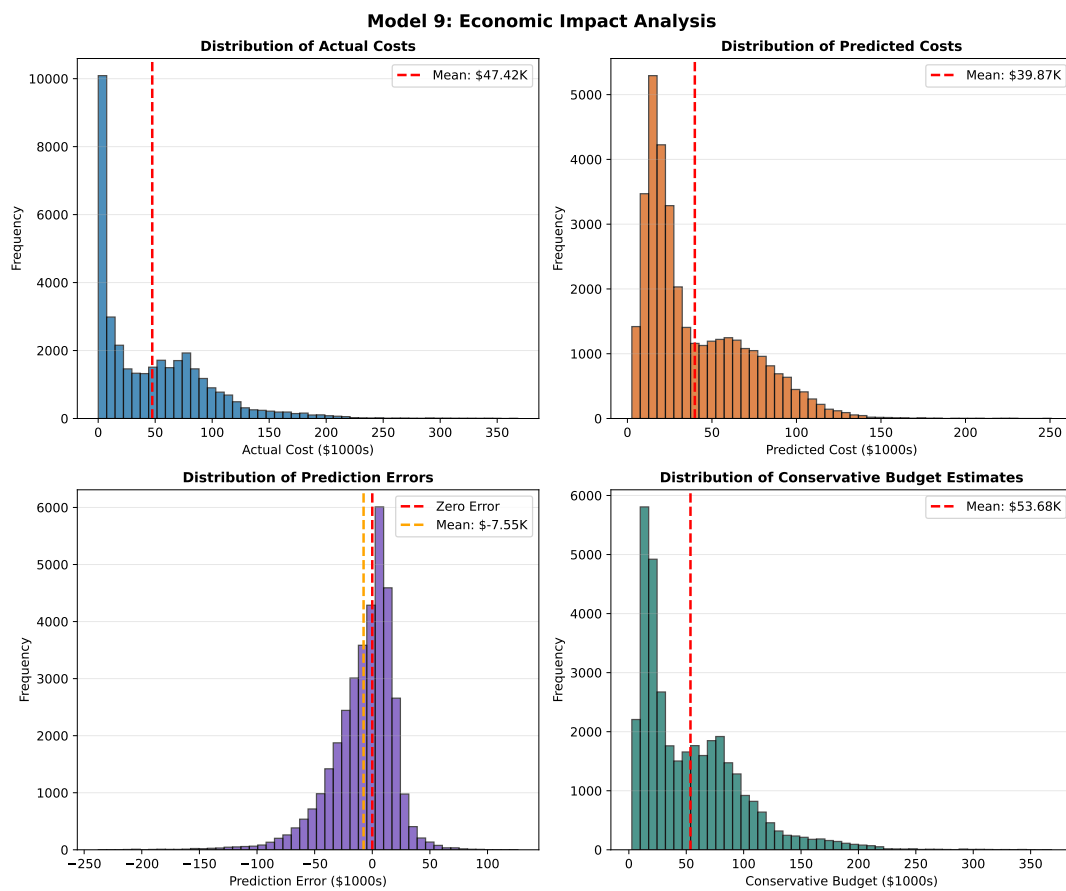


Figure 1.2-7: Model 9: Distribution of costs, predictions, errors, and conservative budget estimates. The conservative estimate takes the maximum of actual and predicted costs to ensure adequate funding (fiscal year 2024–2025).

### 1.3 Comparative Analysis Across Models

Table 1.22 presents a comprehensive comparison of economic impacts across all budget allocation models.

Table 1.22: Comparative Economic Impact Analysis Across All Models (fiscal year 2024–2025)

Model	Samples	$R^2$ Test	Economic Impact	Impact %	Over Budget %
Model 1	35,444	0.4300	\$+228,192,164.33	+13.58%	48.5%
Model 2	35,444	0.4386	\$+397,973,790.19	+23.68%	58.6%
Model 3	35,444	0.4534	\$+269,705,100.03	+16.05%	49.6%
Model 4	35,444	0.4746	\$+363,707,085.93	+21.64%	54.7%
Model 5	35,444	0.4772	\$+364,682,966.38	+21.70%	54.3%
Model 6	35,444	-0.3517	\$+870,493,964.33	+51.79%	68.1%
Model 9	35,444	0.6412	\$+221,815,006.50	+13.20%	47.3%

### 1.4 Key Insights

- Model 9 achieves the highest predictive accuracy with  $R^2 = 0.6412$ .
- Model 6 requires the largest conservative budget adjustment at 51.79%.
- The conservative budgeting approach ensures adequate funding to cover cases where the model under-predicts actual costs.
- Economic impact percentages reflect both model accuracy and the degree of systematic under- or over-prediction.
- Subgroup analyses reveal differential impacts across age groups, living settings, and budget levels, providing insights for targeted policy interventions.
- Impact level distributions identify high-risk cases requiring substantial budget adjustments beyond model predictions.