

Modeling the Economic and Demographic Impacts of Higher Education on the Regional Economy in REMI



*what does REMI say?*sm

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Agenda



- Motivation
- Model Structure
- Previous Research of 2008
- California Research
- Conclusion
- Q & A

Motivation



- Covid-19 has become a major disruption on higher education.
- State cuts not only have begun by putting off spending money but also grown deep.
- Higher education is already taking hits from state cuts due to deep losses in revenue.

Motivation



- Colorado: \$3.1 billion in cuts which would wipe out the state's plans to increase its spending on higher education by 7%.
- Oregon: 8.5% cut over the two-year budget cycle and higher education will lose \$130 million.
- Ohio: \$110 million cuts on higher education.

Motivation



- California: \$2 billion less than planned for the coming year
- 1. The University of California: 290K and \$372 million
- 2. The California State University: 480K and \$404 million
- 3. The California Community Colleges: 2.1M and \$740 million

About REMI



REMI's 40-year history of rigorous academic research and software development has led to the development of the the industry standard in macroeconomic research methodology:

Input-Output

Close analysis of inter-industry relationships

General Equilibrium

Estimate of long-run stability of the economy allows for analysis of policy decisions

Econometrics

Advanced statistical analyses underpinning the model

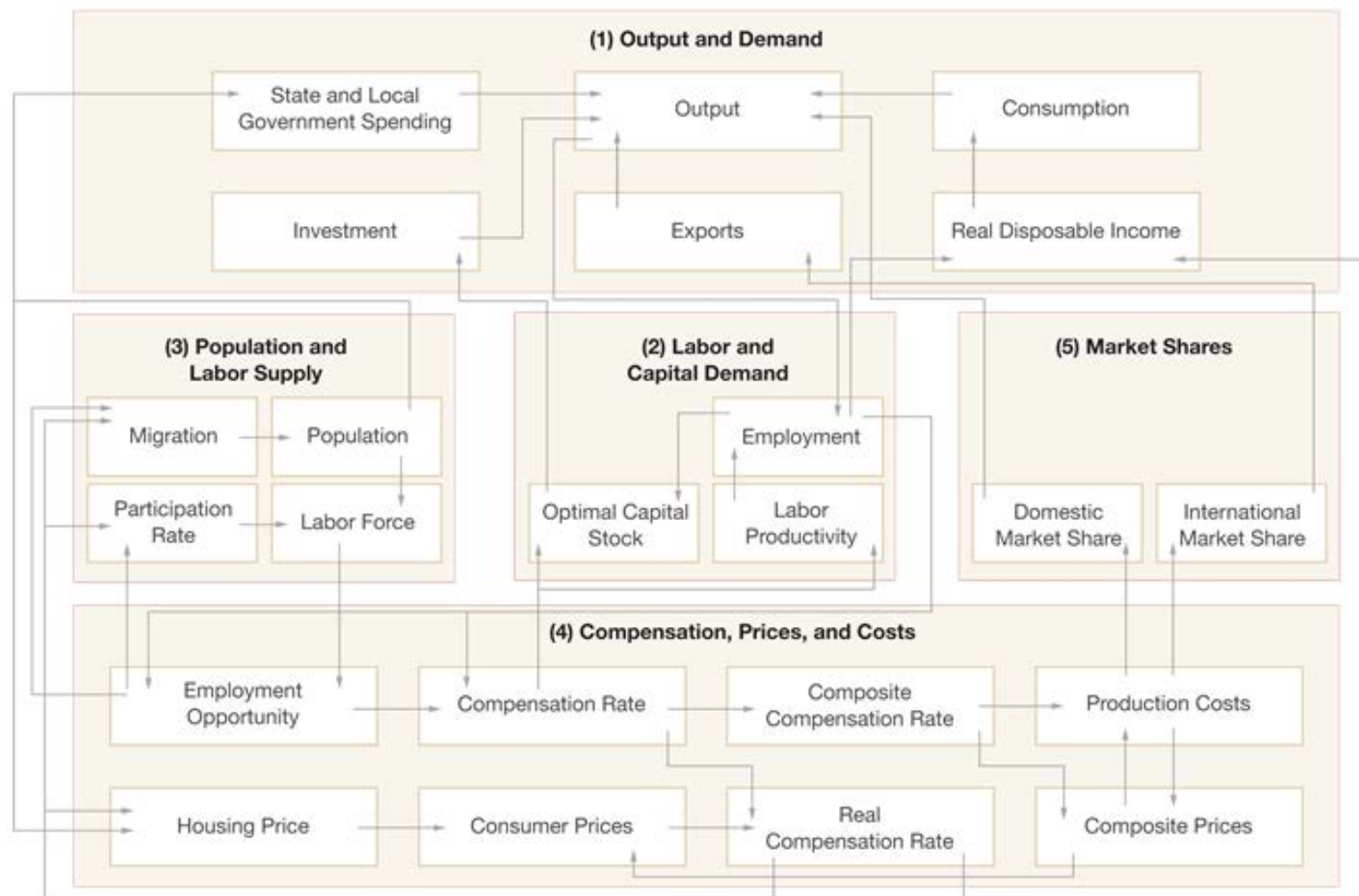
Economic Geography

Effects of geographic concentration of labor and industry

**Integrated REMI
economic modelling
approach**



Model Structure



Previous Research of 2008

- REMI's 2008 research (OSRHE) analyzes the three benefits of higher education to the state economy.
 1. Direct jobs and spending
 2. Productivity benefits
 3. Visitor and athletics

Previous Research of 2008

- **Direct Jobs and Spending**
 1. Faculty and staff employment of state universities, colleges, and technical schools
 2. Student spending
 3. Construction, operations, and maintenance expenditures

Previous Research of 2008

□ Productivity

1. The strongest deriving force
2. Higher education prepares students increase their productivity.
3. Output as a result of the contribution of educated and skilled workers increases.

Previous Research of 2008

- **Visitor and Athletics**

1. Colleges and universities serve as focal points for cultural and athletic activities.

Previous Research of 2008

- Initial investment of one dollar yields \$27.07 over the analysis period make their mark on the economy.
- Graduate productivity itself will account for over 16 percent of the state's economy.

Previous Research of 2008

- Creates many new jobs and increases the attractiveness of Oklahoma to others.
- Higher education is moving Oklahoma and its economy toward a future of long-term, sustained competitive advantage.
- $\text{Income} \uparrow \rightarrow \text{Consumption} \uparrow \rightarrow \text{demand} \uparrow$
 $\rightarrow \text{Output} \uparrow \rightarrow \text{Employment} \uparrow$ (virtuous circle)

Previous Research of 2008

- The average contribution of graduate earnings to employment is 68,184 jobs.
- The Oklahoma higher education system provides enormous economic benefits to the state economy.

CA Study Inputs



Regional Simulation 1

Save Forecast Import Export Print Tools

Select Inputs Inputs List Forecast Options Results

Policy Variable Inputs

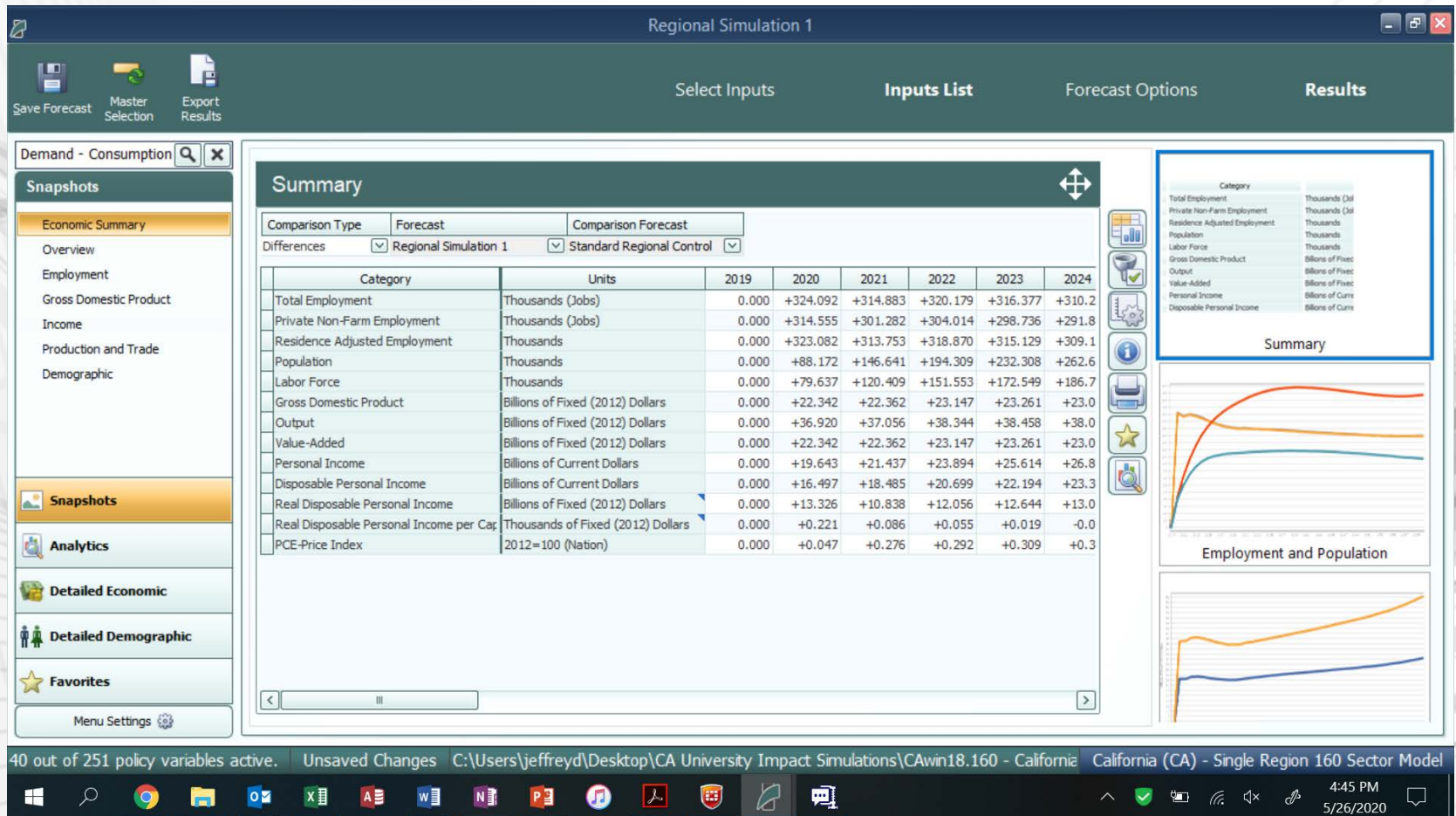
Active	Edit	Group
<input type="checkbox"/>		Table 7-12: Inputs, Books and Tuition (Fixed 2006\$)
<input type="checkbox"/>		Table 7-13: Inputs, Employment (Employment in Units, Compensation in Fixed 2006\$)
<input type="checkbox"/>		Table 7-14: Inputs, Capital Expenditures and Construction (Fixed 2006\$)
<input type="checkbox"/>		Table 7-15: Inputs, Visitor and Athletics
<input type="checkbox"/>		Table 7-16: Inputs, Productivity, Associate's Degree, Industry Sales/Exog Production without Employment, Investment, and Comp
<input type="checkbox"/>		Table 7-17: Inputs, Productivity, Bachelor's Degree, Industry Sales/Exog Production without Employment, Investment, and Comp (Fixed 2006\$)
<input type="checkbox"/>		Table 7-18: Inputs, Productivity, Graduate and Professional Degrees, Industry Sales/Exog Production without Employment, Investment, and Comp
<input checked="" type="checkbox"/>		Industry Sales

1 out of 251 policy variables active. Results do not match inputs, please re-run. Unsaved Changes C:\Users\jeffreyd\Desktop\CA Univers California (CA) - Single Region 160 Sector Model

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Economic Summary



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Consumer Spending



Regional Simulation 1

Save Forecast Master Selection Export Results

Select Inputs Inputs List Forecast Options Results

Demand - Consumption

Analytics

- Impact Profile
- Determinative Graphs
- Model Linkages
- Explore Connections

Snapshots

Analytics

Detailed Economic

Detailed Demographic

Favorites

Menu Settings

Commodity Access Index Intermediate Inputs State and Local Government Spending

Consumption

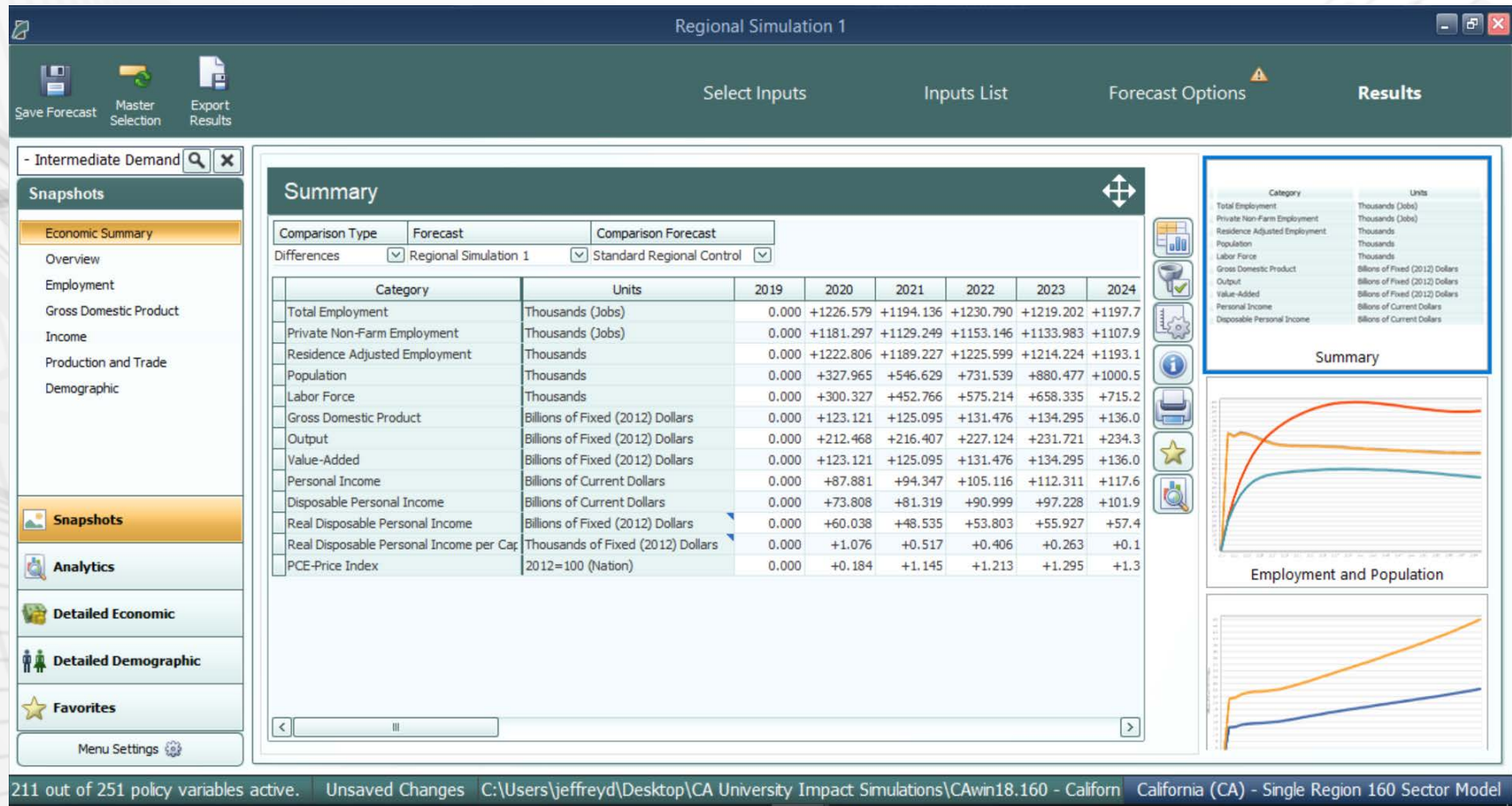
Category	Comparison Type	Forecast	Comparison Forecast									
Commodities	Units	2019	2020	2021	2022	2023	2024	2025	2026			
All Commodities	Billions of Fixed (2012) Dollars	0.000	+13.932	+12.811	+13.825	+14.332	+14.724	+14.926	+15.156			
Household maintenance	Billions of Fixed (2012) Dollars	0.000	+2.951	+2.943	+2.946	+2.947	+2.947	+2.945	+2.944			
Imputed rental of owner-occupied nonfarm dwellings	Billions of Fixed (2012) Dollars	0.000	+0.874	+0.481	+0.629	+0.718	+0.798	+0.863	+0.927			
Video, audio, photographic, and information services	Billions of Fixed (2012) Dollars	0.000	+0.679	+0.625	+0.681	+0.713	+0.742	+0.758	+0.776			
Physician services	Billions of Fixed (2012) Dollars	0.000	+0.568	+0.488	+0.488	+0.473	+0.459	+0.442	+0.432			
Hospitals	Billions of Fixed (2012) Dollars	0.000	+0.540	+0.624	+0.716	+0.780	+0.834	+0.874	+0.912			
Food and nonalcoholic beverages purchased for home consumption	Billions of Fixed (2012) Dollars	0.000	+0.488	+0.505	+0.573	+0.615	+0.647	+0.669	+0.689			
Rental of tenant-occupied nonfarm housing units	Billions of Fixed (2012) Dollars	0.000	+0.462	+0.361	+0.466	+0.530	+0.579	+0.614	+0.643			
Purchased meals and beverages	Billions of Fixed (2012) Dollars	0.000	+0.461	+0.494	+0.581	+0.639	+0.684	+0.715	+0.739			
Pharmaceutical and other medical products	Billions of Fixed (2012) Dollars	0.000	+0.449	+0.332	+0.318	+0.294	+0.273	+0.253	+0.240			
Final consumption expenditures of nonresidential business	Billions of Fixed (2012) Dollars	0.000	+0.369	+0.306	+0.299	+0.285	+0.273	+0.260	+0.252			
Financial service charges, fees, and commissions	Billions of Fixed (2012) Dollars	0.000	+0.313	+0.278	+0.285	+0.282	+0.279	+0.273	+0.271			
Foreign travel by U.S. residents	Billions of Fixed (2012) Dollars	0.000	+0.281	+0.313	+0.336	+0.345	+0.348	+0.343	+0.336			
New motor vehicles	Billions of Fixed (2012) Dollars	0.000	+0.280	+0.262	+0.270	+0.270	+0.268	+0.263	+0.261			
Furniture and furnishings	Billions of Fixed (2012) Dollars	0.000	+0.278	+0.249	+0.262	+0.266	+0.269	+0.268	+0.269			

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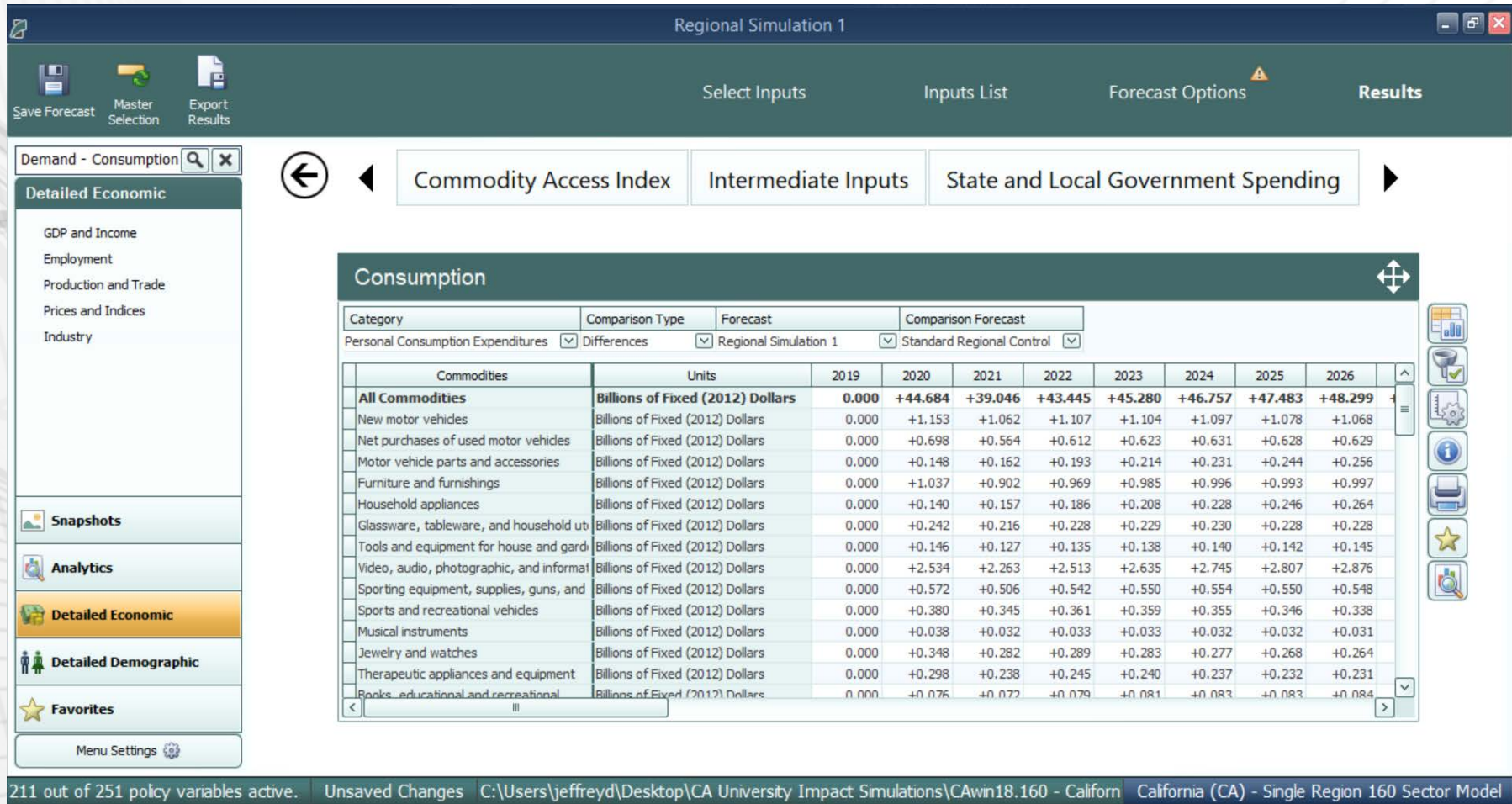
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Economic Summary (Graduate Employment and Productivity)



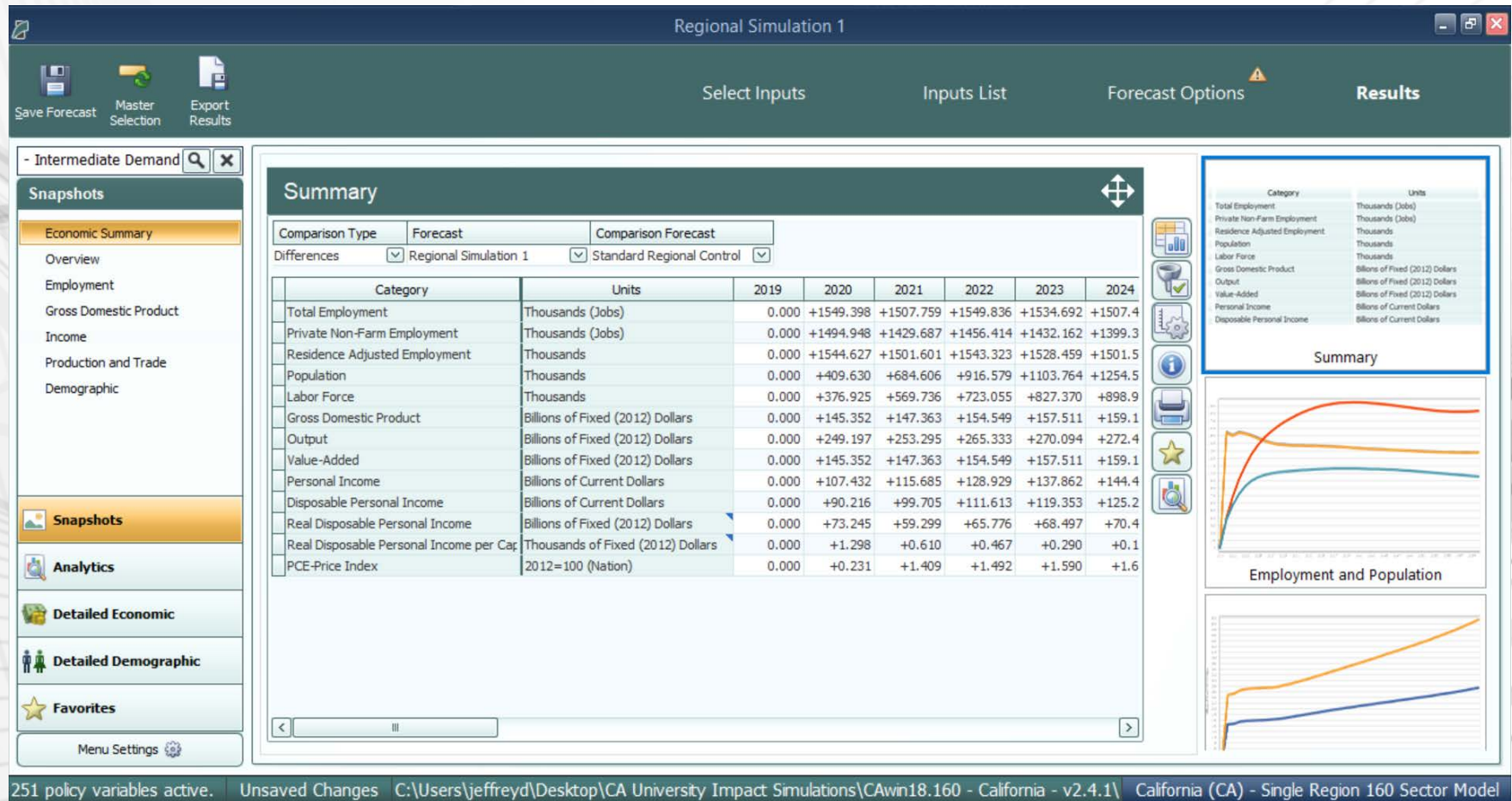
what does REMI say? sm

Consumer Spending (Graduate Employment and Productivity)



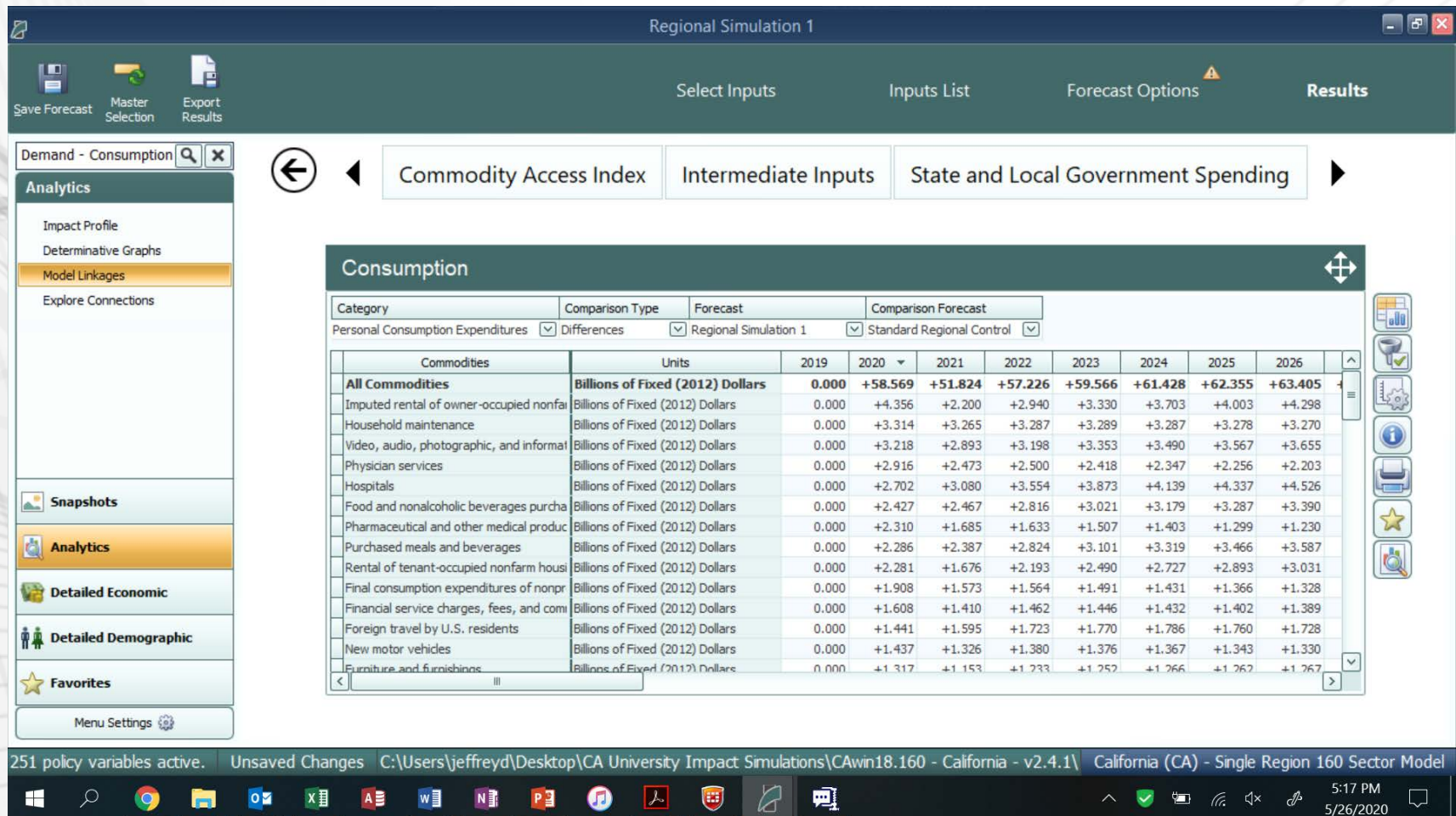
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Economic Summary (Total Impact)



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Consumer Spending (Total Impact)



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Conclusion



- Confirmed that initial investments of higher education paid off.
- Large and growing share of future jobs will require college-educated workers.
- Creating many new jobs and increasing the attractiveness of the region (California) to others.

Conclusion



- Part of a continued and long-term strategy in building state infrastructure.
- Productivity is the support mechanism for economic growth.
- REMI's model predicts that long-term economic benefits accrue across the economy when the state makes investments in its higher education system.

Thank you so much!