REMI PI+
STRUCTURE OF THE MODEL

what does REMI say? sm

Presented by Regional Economic Models, Inc.

What is PI+?

PI+ is *the leading off-the-shelf solution for conducting dynamic macroeconomic impact analysis of public policy.*

PI+ allows users to understand the deep linkages and relationship between a policy and its economic foundation.

PI+ is uniquely customizable to your region's economy:

- **6,000+ policy variables**
- **Detailed industrial sector data**
- **Accommodates region's economic and demographic projections**

About REMI

REMI's 35-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

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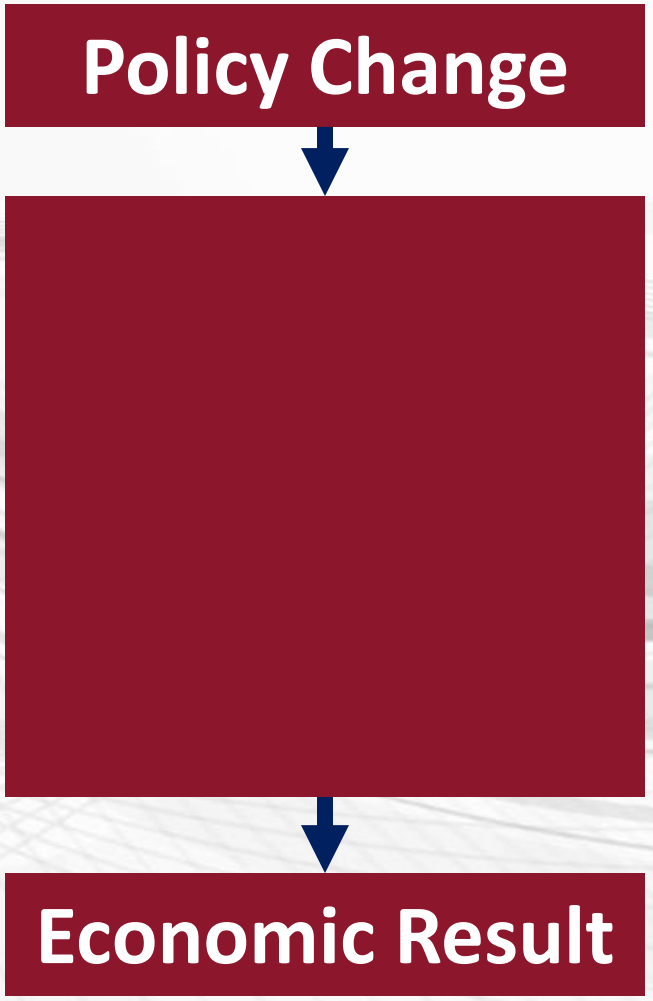
Policy and the Economy



Policy and the Economy

Policy Change

Economic Result

what does REMI say? [sm]

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Policy and the Economy

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what does REMI say? [sm]

Two motivating examples

- **Hiring at Boston University**
- Higher chemical manufacturing costs

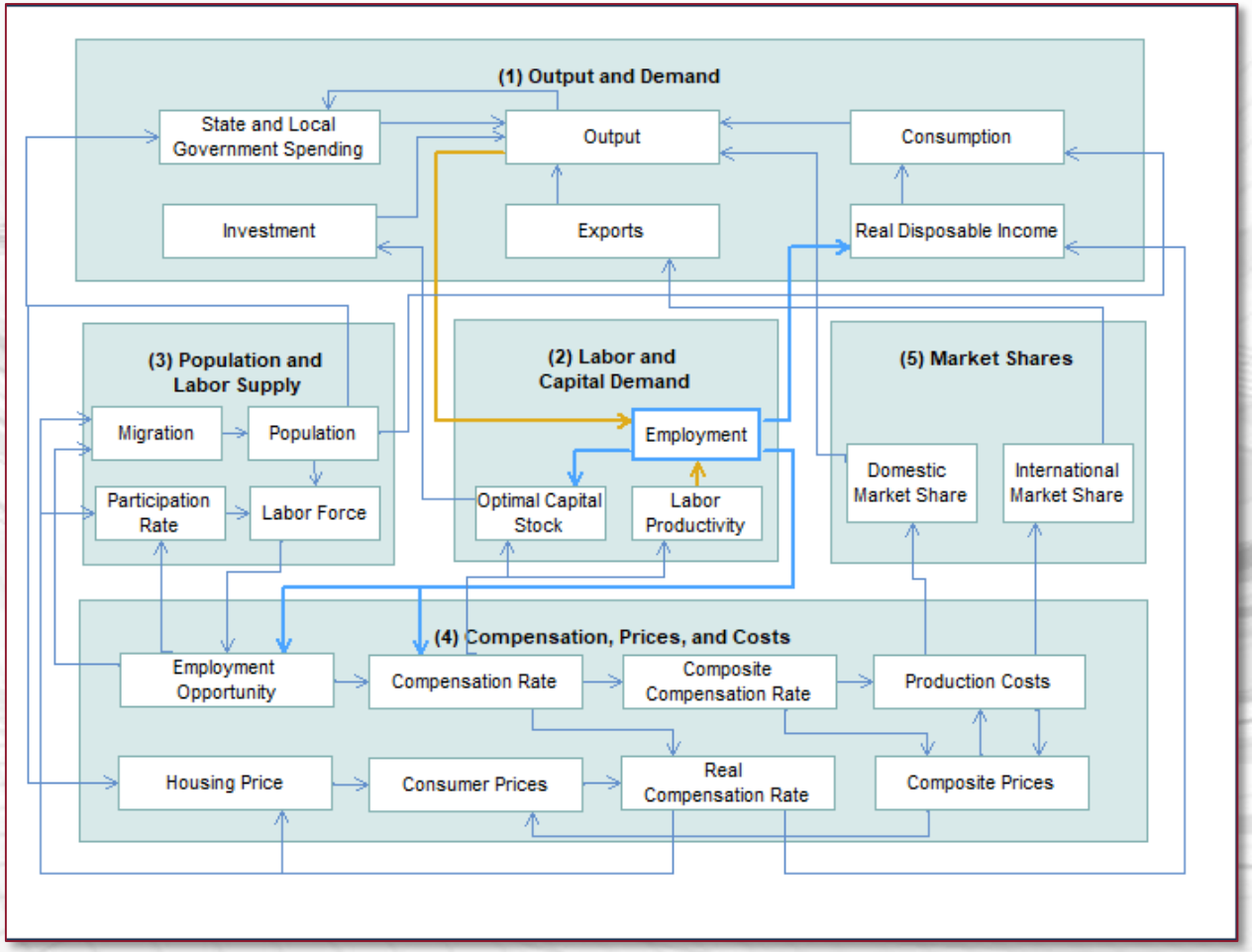
BU Expansion

- Hiring in several sectors

BU Expansion

Active	View	Category	Detail	Region	Units	20:	20:	20:	2019	2020	2021	2022	2023
☑	🔍	Employment	Industry (Exogenous Production): Professional, scientific, and technical services	Suffolk County	Units	0	0	0	200	200	200	200	200
☑	🔍	Employment	Industry (Exogenous Production): Repair and maintenance	Suffolk County	Units	0	0	0	400	400	400	400	400
☑	🔍	Employment	Industry (Exogenous Production): Management of companies and enterprises	Suffolk County	Units	0	0	0	100	100	100	100	100

BU Expansion



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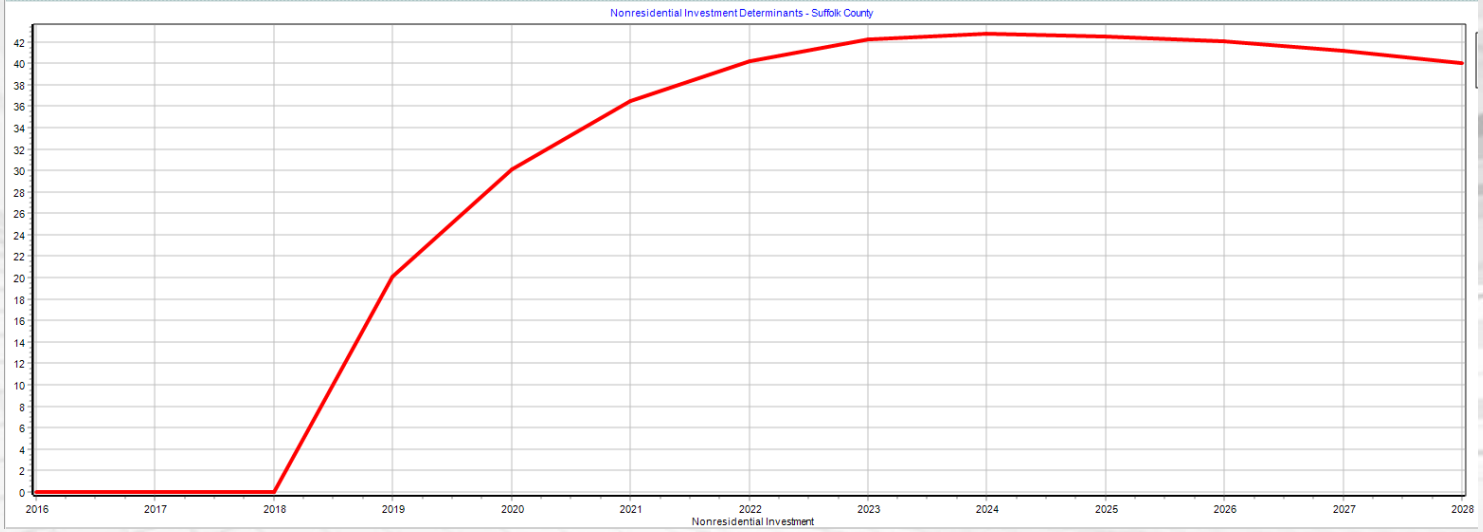
BU Expansion

- Optimal capital stock increases
- Investment Increases

Category	Units	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Nonresidential Investment	Millions of Chained (2009) Doll	0.00%	0.00%	0.00%	+20.13%	+30.08%	+36.47%	+40.16%	+42.18%	+42.76%	+42.52%	+42.04%	+41.14%	+40.01%
Regional Nonresidential Actual Capital St	Millions of Fixed (2018) Dollars	0.00%	0.00%	0.00%	+0.61%	+1.52%	+2.63%	+3.85%	+5.13%	+6.41%	+7.67%	+8.89%	+10.05%	+11.15%
Regional Nonresidential Optimal Capital S	Millions of Fixed (2018) Dollars	0.00%	0.00%	0.00%	+11.36%	+12.11%	+13.91%	+15.23%	+16.35%	+17.27%	+18.01%	+18.66%	+19.21%	+19.70%

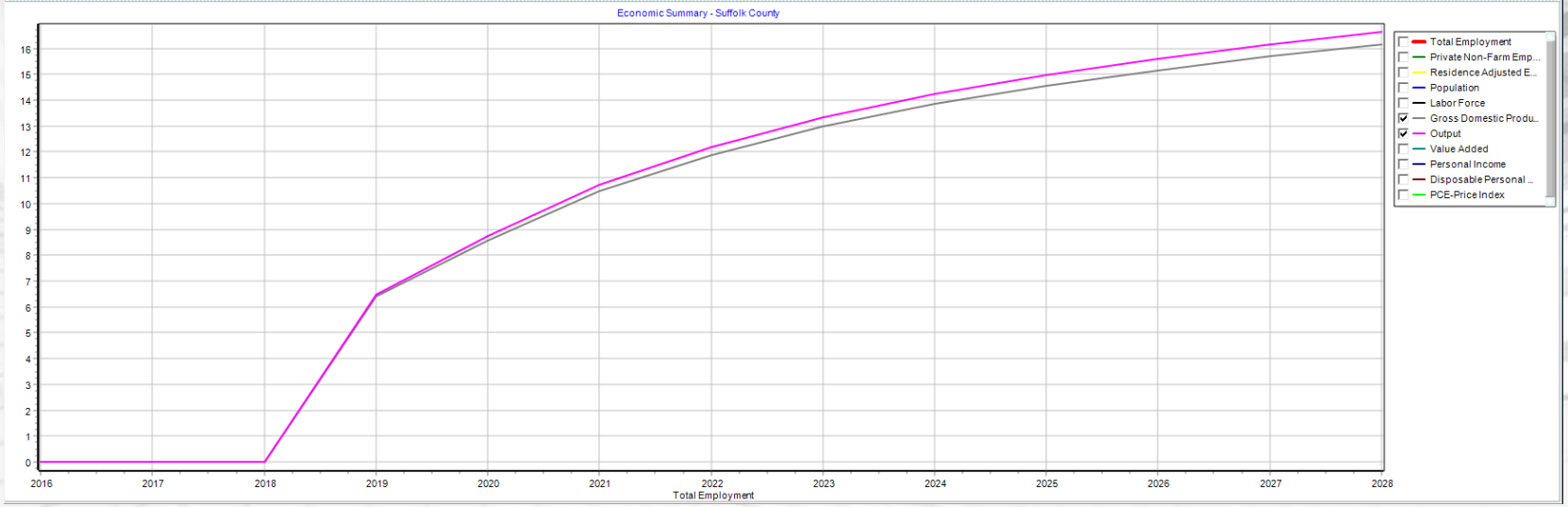


BU Expansion

- Domestic demand (industries) increases
- Output Increases

Region: Suffolk County

Category	Units	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Total Employment	Individuals (Jobs)	0.00%	0.00%	0.00%	+7.50%	+9.94%	+12.12%	+13.73%	+15.00%	+16.01%	+16.81%	+17.49%	+18.08%	+18.62%
Private Non-Farm Employment	Individuals (Jobs)	0.00%	0.00%	0.00%	+8.92%	+11.37%	+13.57%	+15.17%	+16.42%	+17.39%	+18.16%	+18.80%	+19.36%	+19.86%
Residence Adjusted Employment	Individuals	0.00%	0.00%	0.00%	+12.12%	+13.30%	+15.62%	+17.46%	+19.09%	+20.53%	+21.80%	+23.00%	+24.12%	+25.19%
Population	Individuals	0.00%	0.00%	0.00%	+2.79%	+5.03%	+7.23%	+9.29%	+11.20%	+12.96%	+14.58%	+16.08%	+17.49%	+18.81%
Labor Force	Individuals	0.00%	0.00%	0.00%	+4.91%	+7.74%	+10.38%	+12.72%	+14.87%	+16.79%	+18.52%	+20.10%	+21.54%	+22.85%
Gross Domestic Product	Millions of Fixed (2018) Dollars	0.00%	0.00%	0.00%	+6.40%	+8.57%	+10.47%	+11.88%	+12.99%	+13.87%	+14.56%	+15.16%	+15.69%	+16.17%
Output	Millions of Fixed (2018) Dollars	0.00%	0.00%	0.00%	+6.49%	+8.75%	+10.72%	+12.19%	+13.34%	+14.26%	+14.99%	+15.61%	+16.15%	+16.64%
Value Added	Millions of Fixed (2018) Dollars	0.00%	0.00%	0.00%	+6.45%	+8.62%	+10.53%	+11.94%	+13.04%	+13.92%	+14.62%	+15.22%	+15.74%	+16.21%
Personal Income	Millions of Fixed (2018) Dollars	0.00%	0.00%	0.00%	+20.01%	+20.51%	+22.72%	+24.55%	+26.30%	+27.92%	+29.38%	+30.78%	+32.14%	+33.43%



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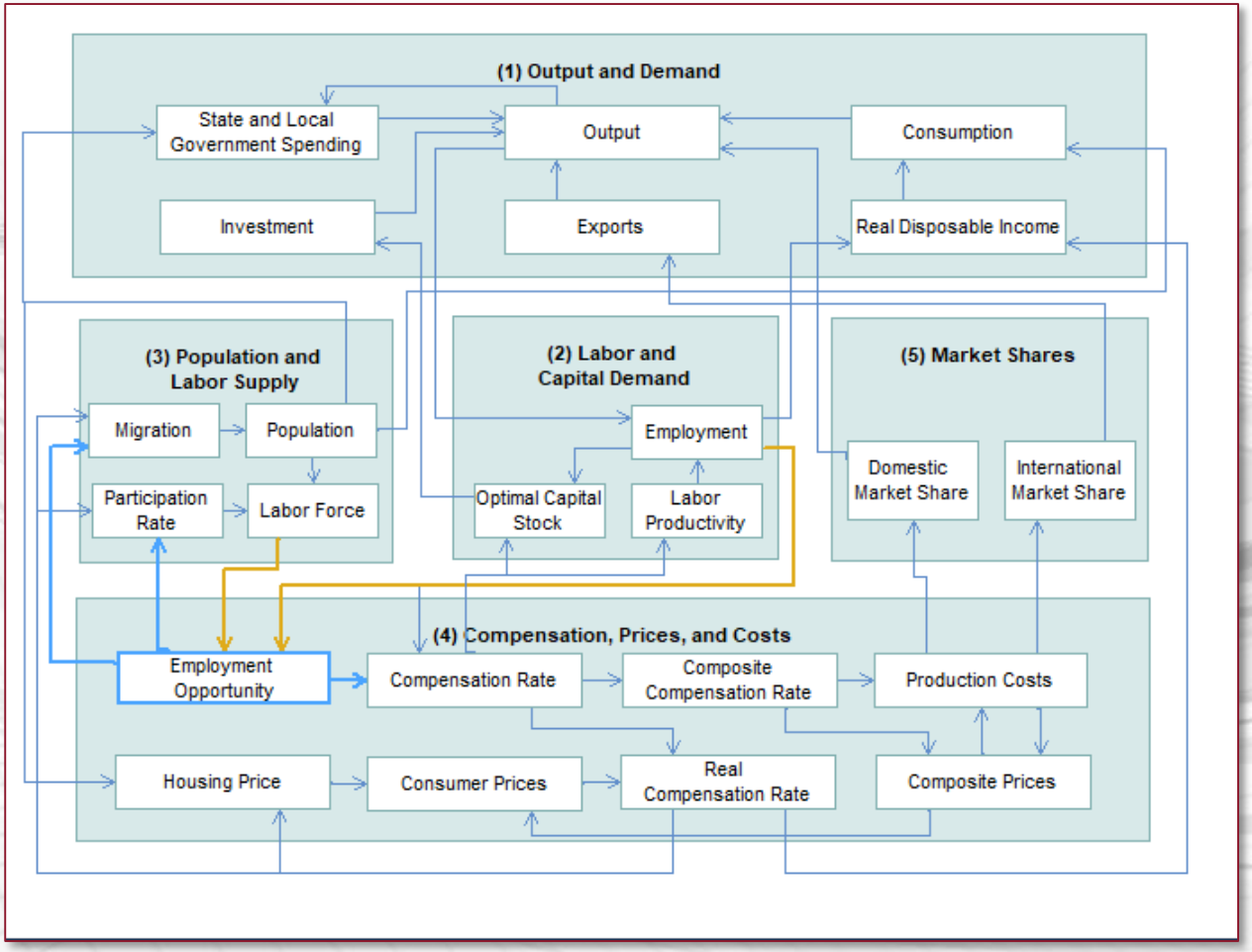
BU Expansion



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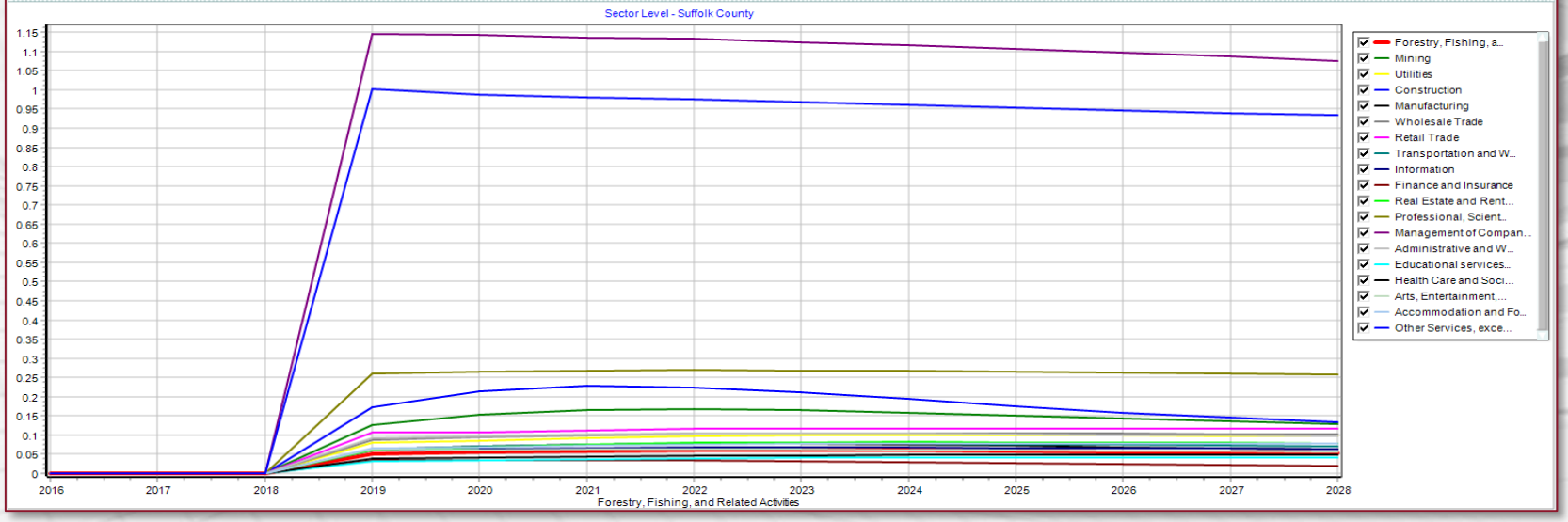
BU Expansion

- Rising demand in labor market
- Compensation Rises

Region
Suffolk County

Category	Units	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Management of Companies and Enterpris	Billions of Current Dollars	0.00%	0.00%	0.00%	+1.15%	+1.14%	+1.14%	+1.13%	+1.12%	+1.12%	+1.11%	+1.10%	+1.09%	+1.08%
Other Services, except Public Administra	Billions of Current Dollars	0.00%	0.00%	0.00%	+1.00%	+0.99%	+0.98%	+0.98%	+0.97%	+0.96%	+0.95%	+0.95%	+0.94%	+0.93%
Professional, Scientific, and Technical Se	Billions of Current Dollars	0.00%	0.00%	0.00%	+0.26%	+0.27%	+0.27%	+0.27%	+0.27%	+0.27%	+0.27%	+0.26%	+0.26%	+0.26%
Construction	Billions of Current Dollars	0.00%	0.00%	0.00%	+0.17%	+0.22%	+0.23%	+0.22%	+0.21%	+0.19%	+0.18%	+0.16%	+0.14%	+0.13%
Mining	Billions of Current Dollars	0.00%	0.00%	0.00%	+0.13%	+0.15%	+0.17%	+0.17%	+0.17%	+0.16%	+0.15%	+0.14%	+0.14%	+0.13%
Retail Trade	Billions of Current Dollars	0.00%	0.00%	0.00%	+0.11%	+0.11%	+0.11%	+0.12%	+0.12%	+0.12%	+0.12%	+0.12%	+0.12%	+0.12%
Administrative and Waste Management S	Billions of Current Dollars	0.00%	0.00%	0.00%	+0.09%	+0.10%	+0.10%	+0.10%	+0.10%	+0.10%	+0.10%	+0.10%	+0.10%	+0.10%
Wholesale Trade	Billions of Current Dollars	0.00%	0.00%	0.00%	+0.09%	+0.09%	+0.10%	+0.10%	+0.11%	+0.11%	+0.10%	+0.10%	+0.10%	+0.10%



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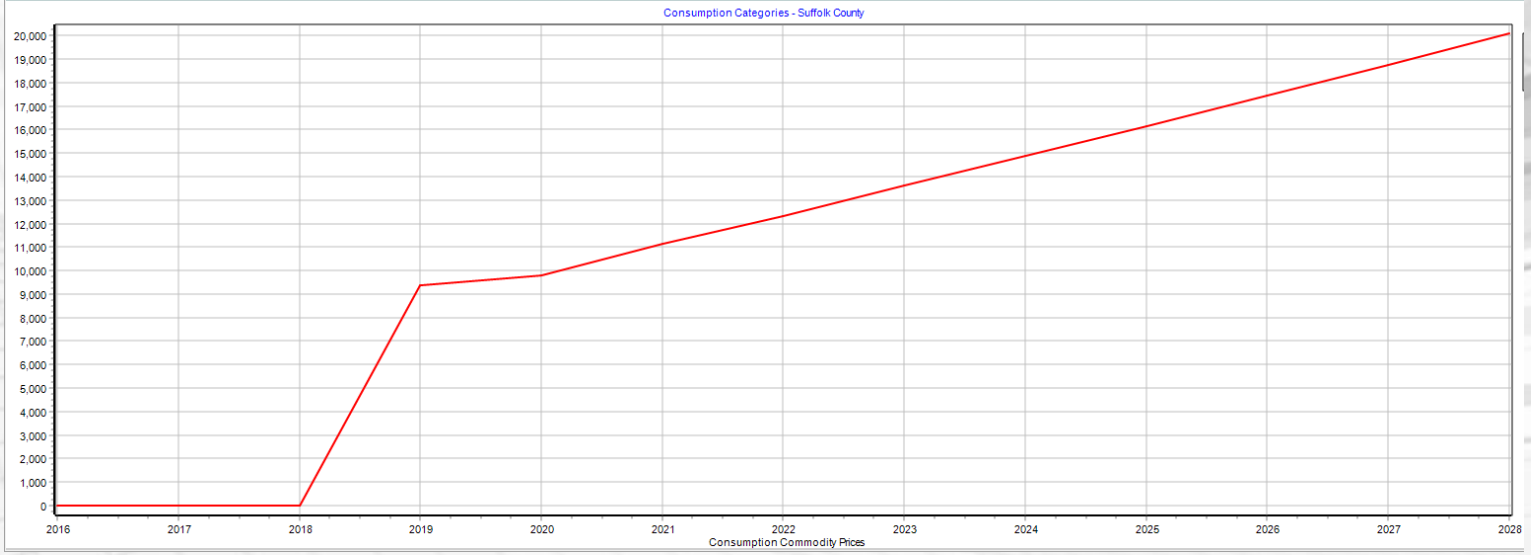
BU Expansion

- A large influx of economic migrants

BU Expansion

- Higher local population drives consumption upwards

Category	Units	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Personal Consumption Expenditures	Millions of Fixed (2018) Dollars	0.000	0.000	0.000	+9386.697	+9806.512	+11121.919	+12326.247	+13609.337	+14895.720	+16136.656	+17436.039	+18729.246	+20094.369
Personal Consumption Expenditures (Cha	Millions of Chained (2009) Dolla	0.000	0.000	0.000	+8239.513	+8623.799	+9804.118	+10884.966	+12036.034	+13188.944	+14302.980	+15472.046	+16638.695	+17872.058
Consumption Commodity Prices	2009=1 (Nation)	0.000	0.000	0.000	-0.095	-0.090	-0.089	-0.088	-0.088	-0.088	-0.089	-0.090	-0.092	-0.093



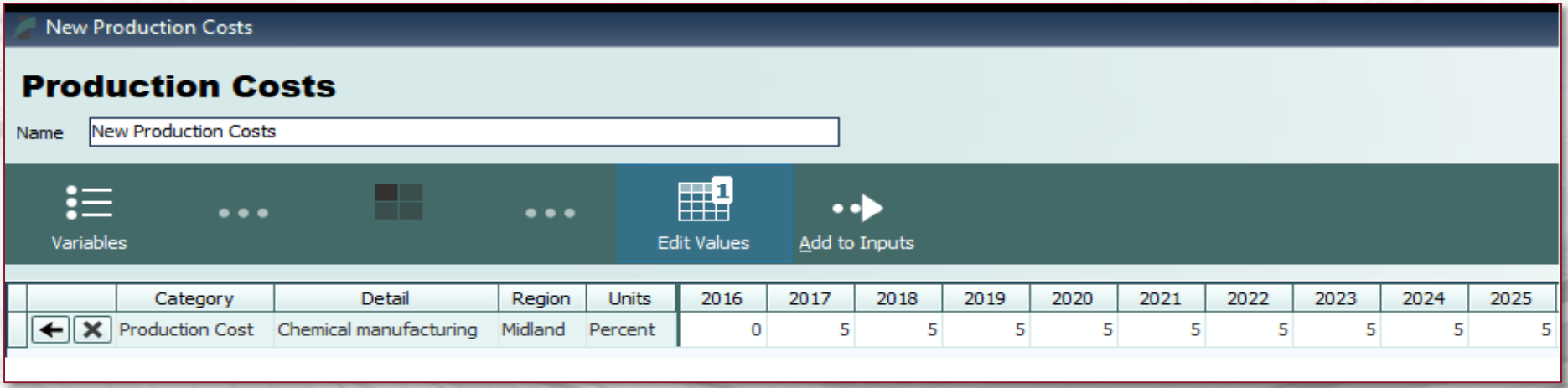
what does REMI say? [sm]

Two motivating examples

- Hiring at Boston University
- **Higher chemical manufacturing costs**

Chemical Manufacturing Demo

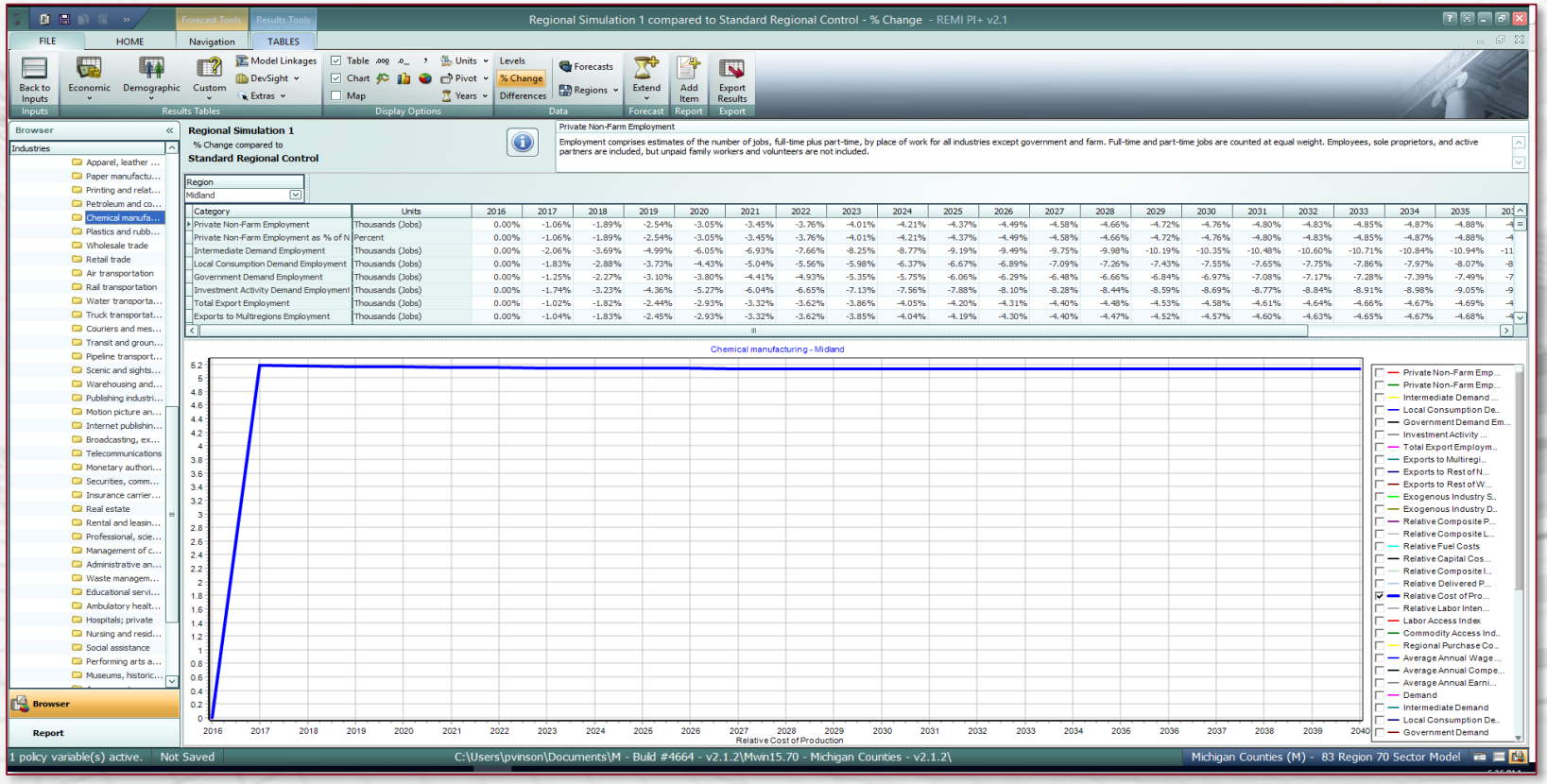
- 5% increase in production cost from regulation



	Category	Detail	Region	Units	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Production Cost	Chemical manufacturing	Midland	Percent	0	5	5	5	5	5	5	5	5	5

Chemical Manufacturing Demo

- Increase in production costs



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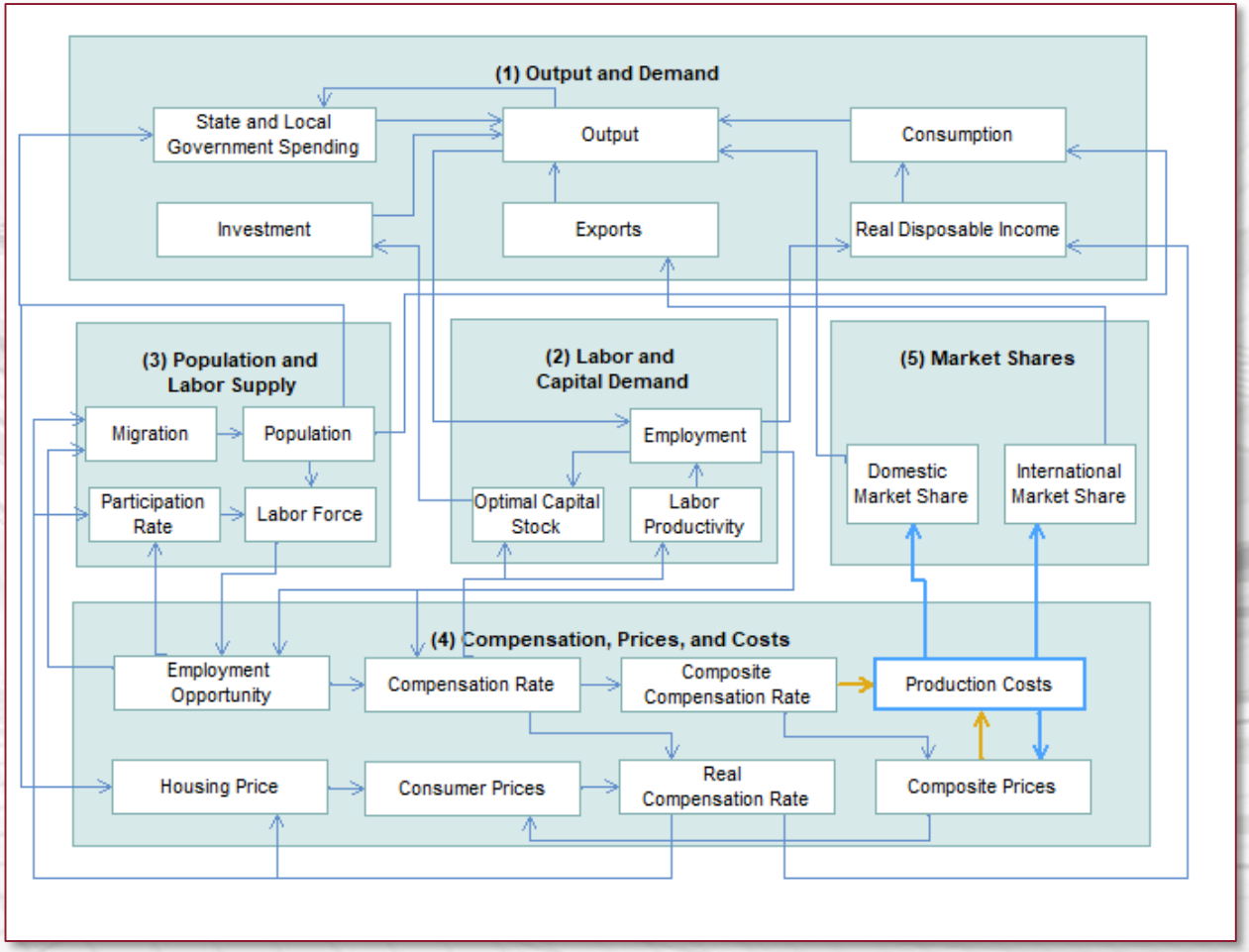
Model Linkages



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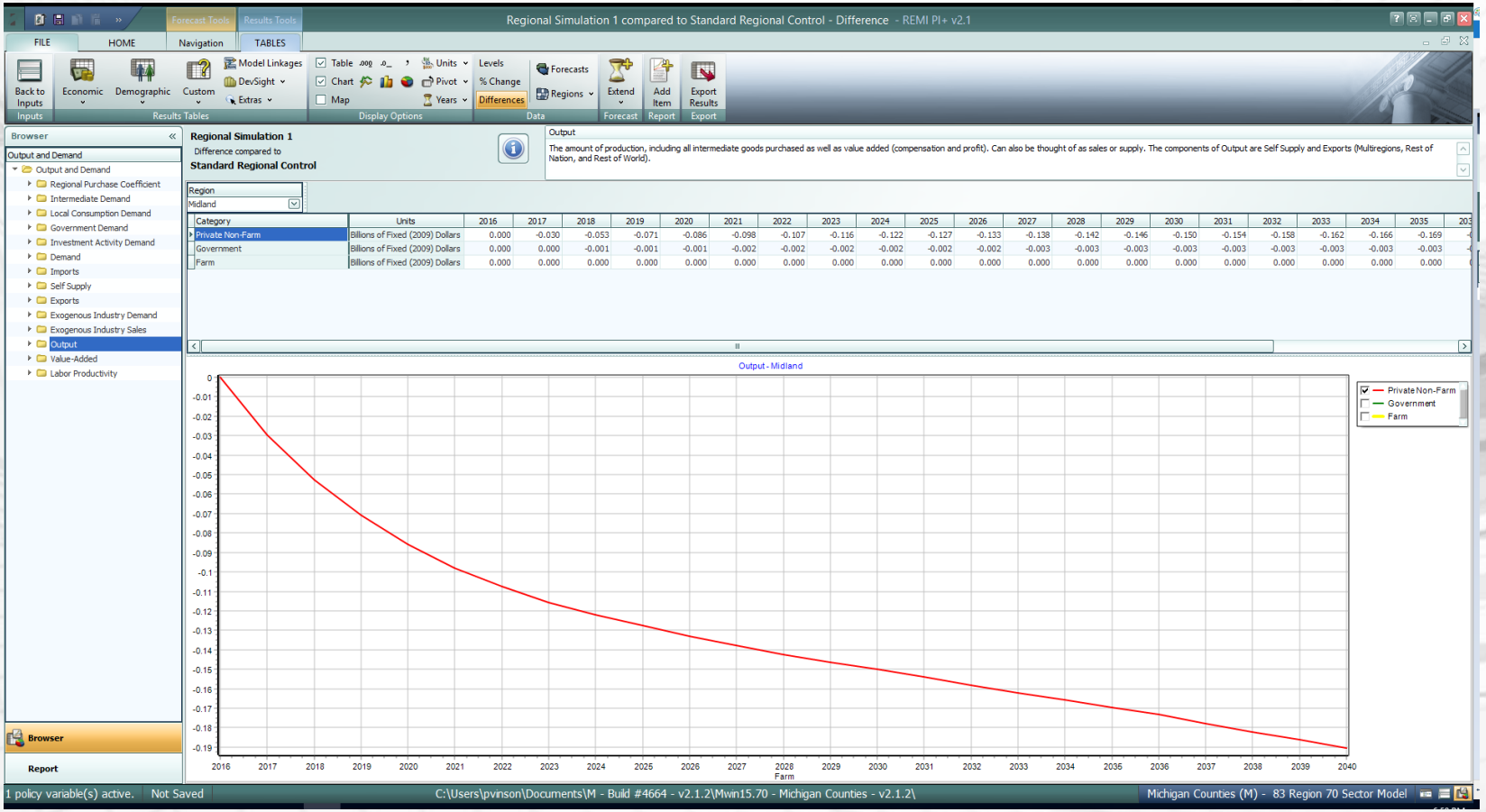
Chemical Manufacturing Demo

- Output falls



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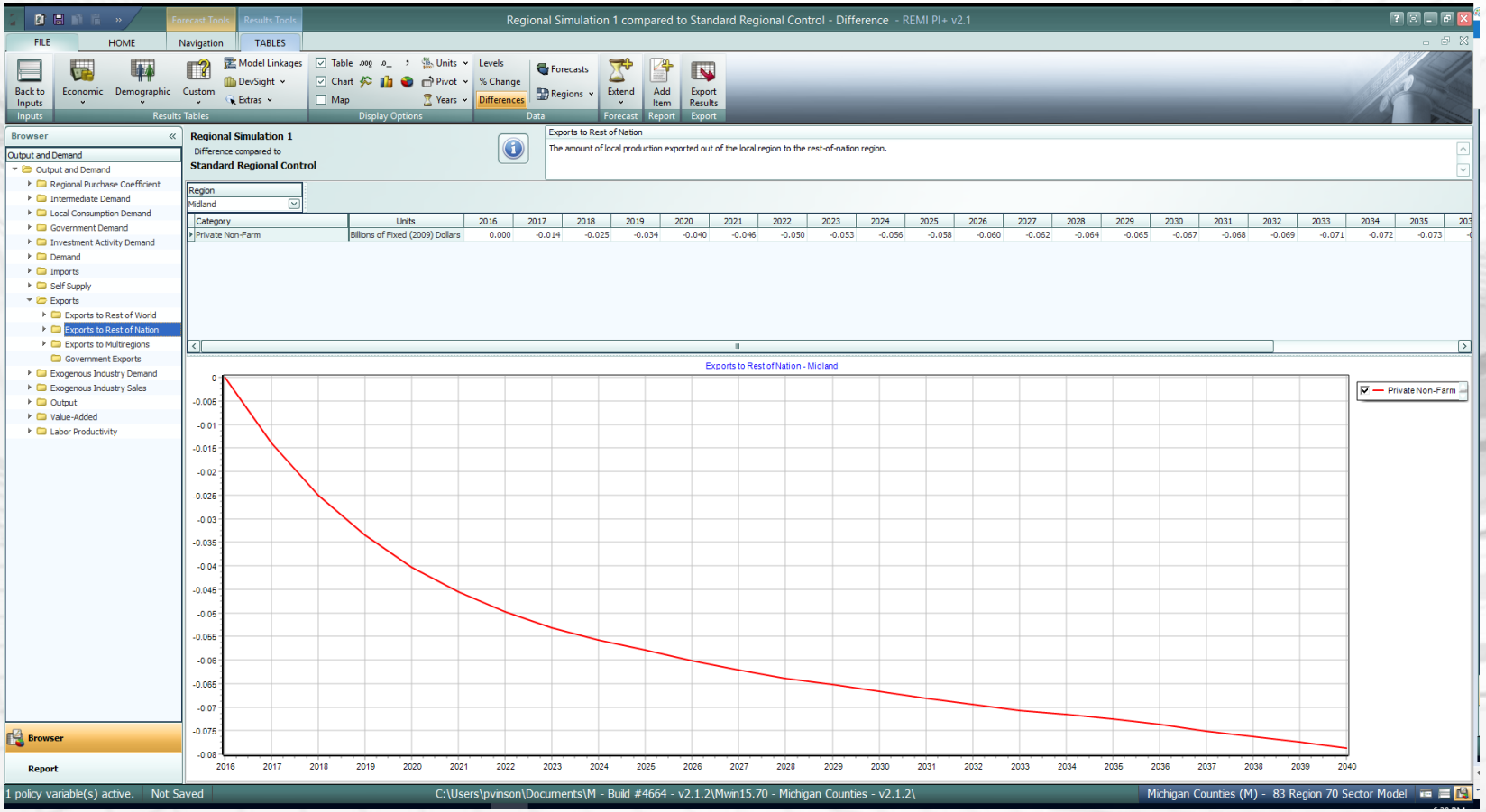
Chemical Manufacturing Demo

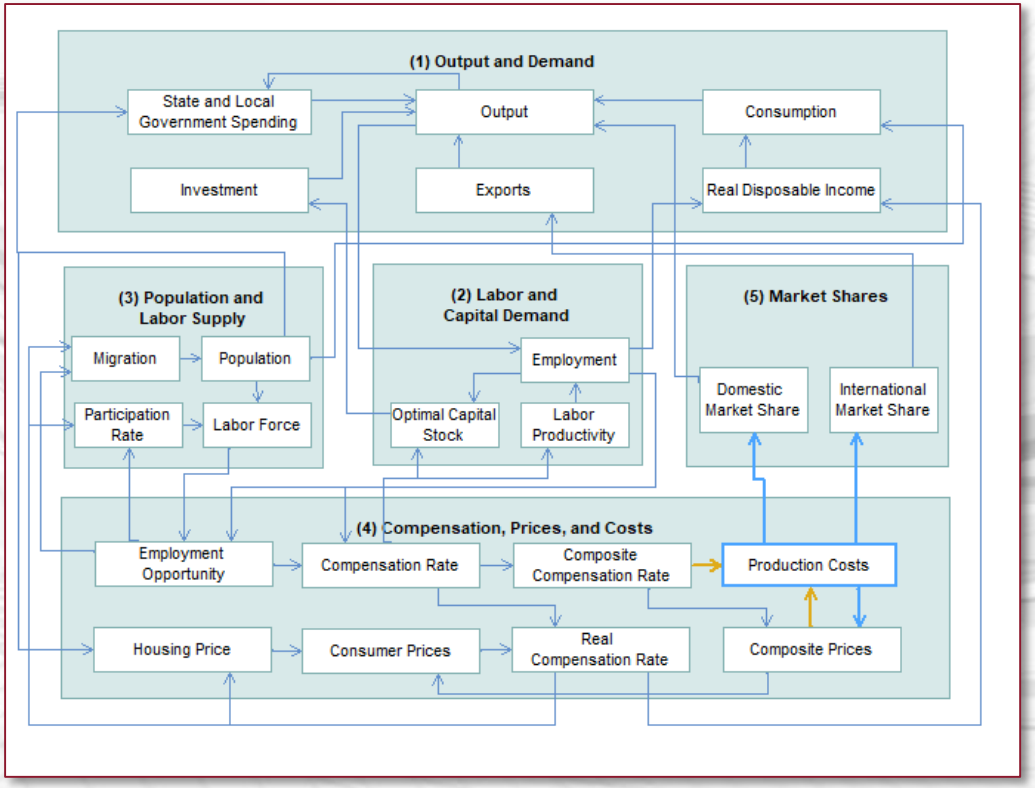
- Driven by lower self-supply <u>and</u> falling exports



what does REMI say? sm

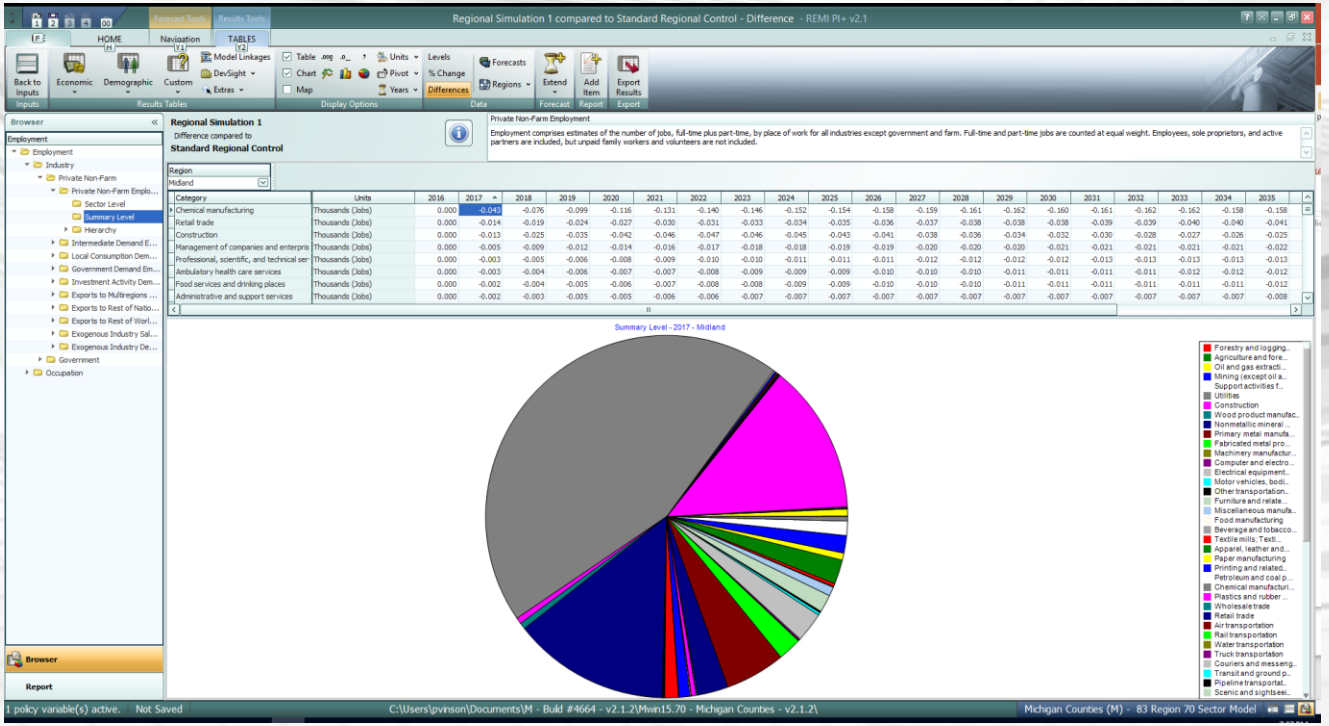
Model Linkages

- Employment declines



Chemical Manufacturing Demo

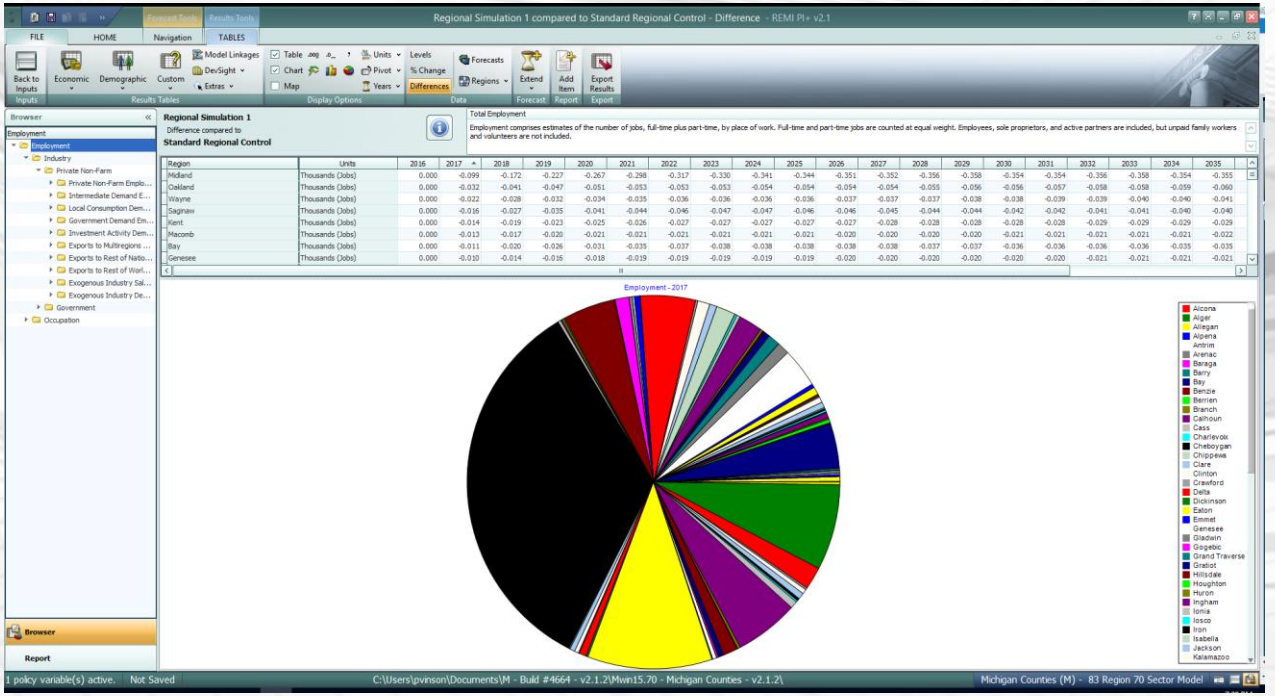
- Job impacts by industry
- Big impact on chem manufacturing jobs, but also construction & retail
  - Less income means less demand



what does REMI say? [sm]

Chemical Manufacturing Demo

- Statewide job impacts as trade network is affected
  - Employment affects compensation, then income, then consumption demand



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Takeaways

- REMI's structure shows how economic events can shape factors across the economy
- REMI can help tell stories