Presentation to Begin Shortly After 2:00 PM (EST)

REMI 2.0 LAUNCH SERIES

ECONOMIC AND DEMOGRAPHIC DIMENSIONS OF REGIONAL GROWTH

what does REMI say? sm

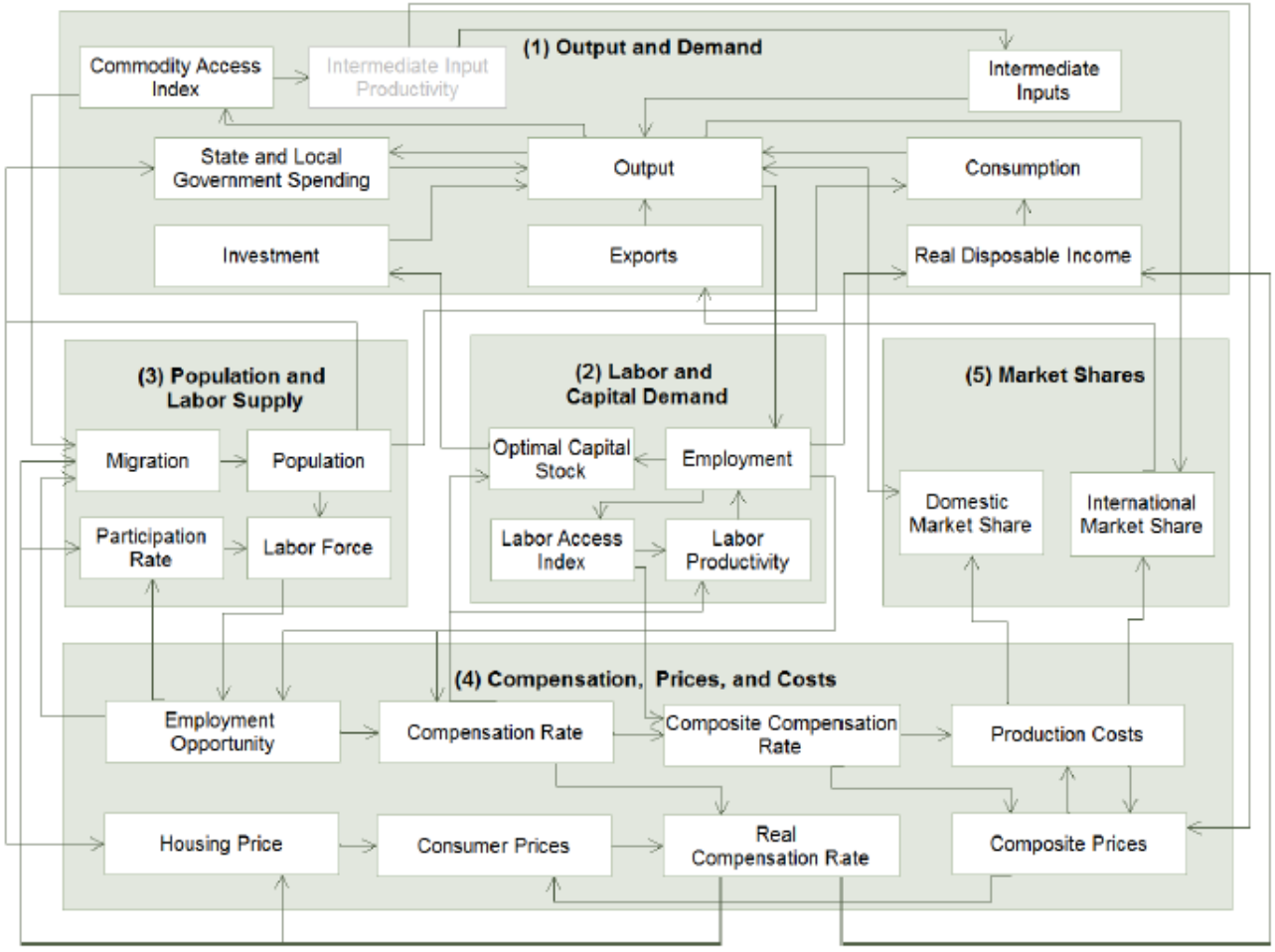
Presented by Marley Buchman, Senior Economic Associate

Launch Series Schedule and Outline

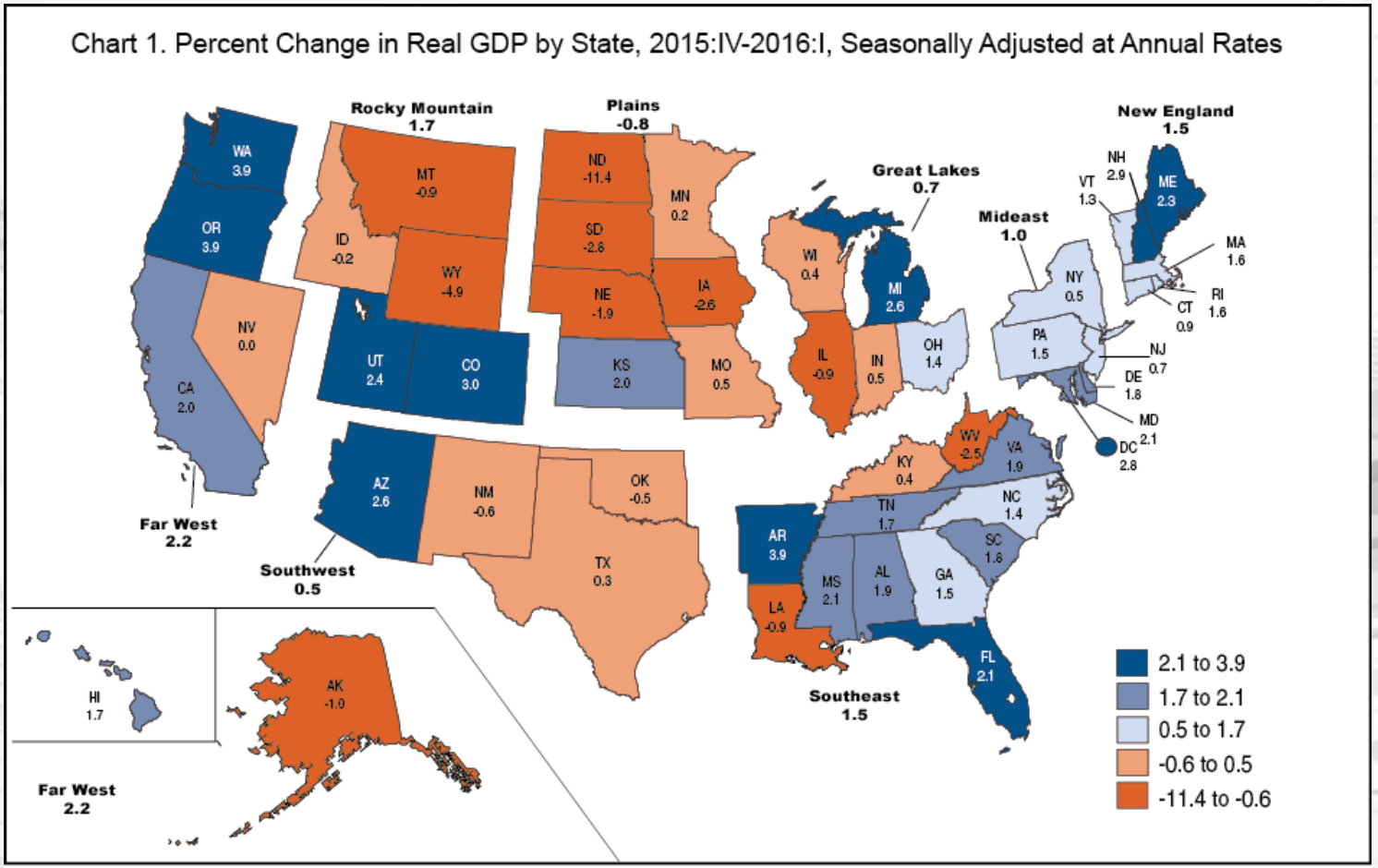
- **Session 4: From Start to Finish: Completing a REMI Analysis**
  - Feb. 7th and Feb. 9th, 2:00 PM EST

Register at www.remi.com

Model Structure



State GDP Growth (2015-2016)



U.S. Bureau of Economic Analysis

what does REMI say? [sm]

Determinants of Long Run Growth

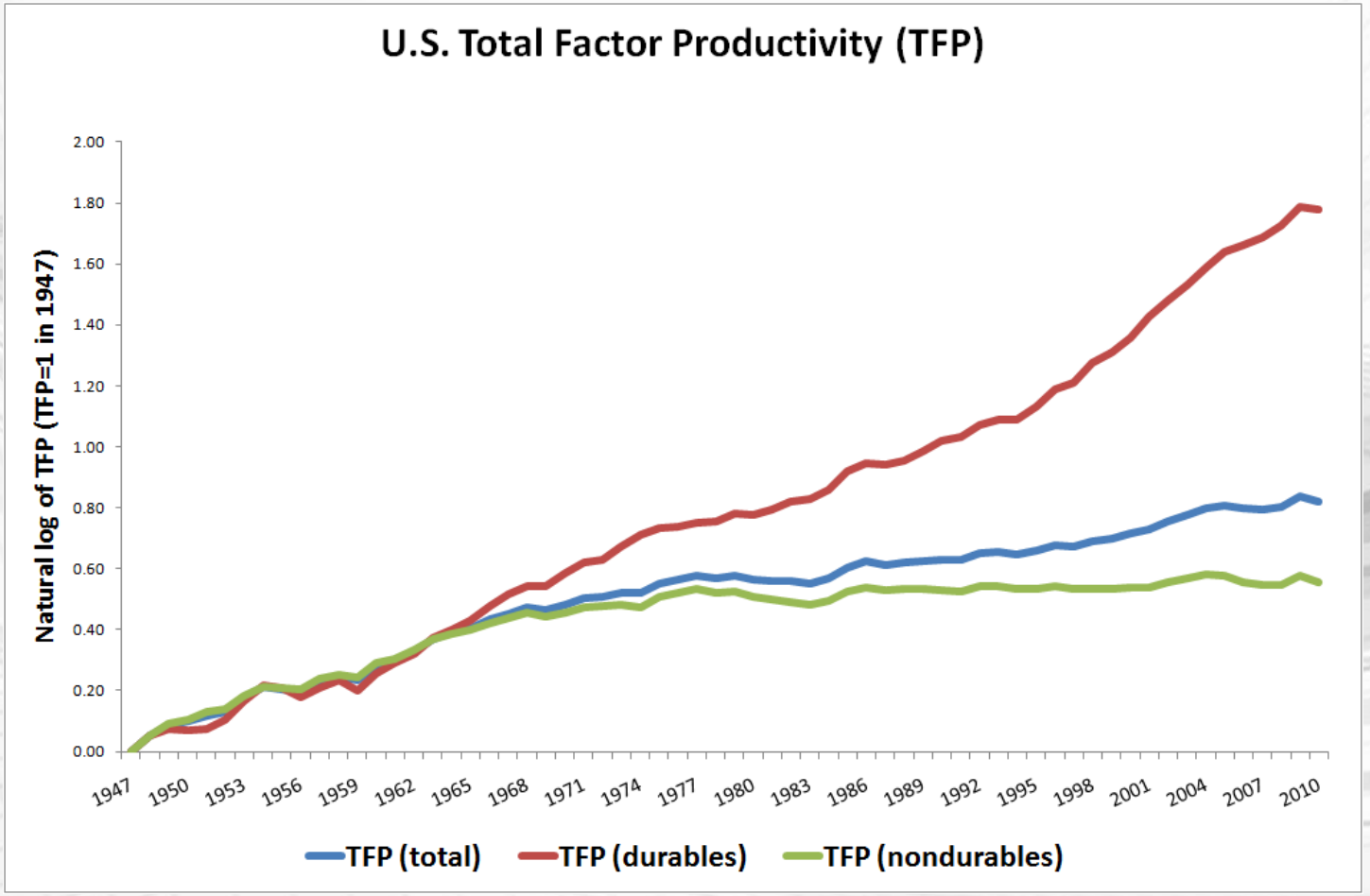
Long Run Output Growth = Labor Force Growth + Productivity Growth

Y = Output
P = Productivity
LF = Labor Force

Assumptions:
These factors are the long run, smoothing fundamentals that determine growth

This description of economic growth applies when the economy is close to full employment

Total Factor Productivity



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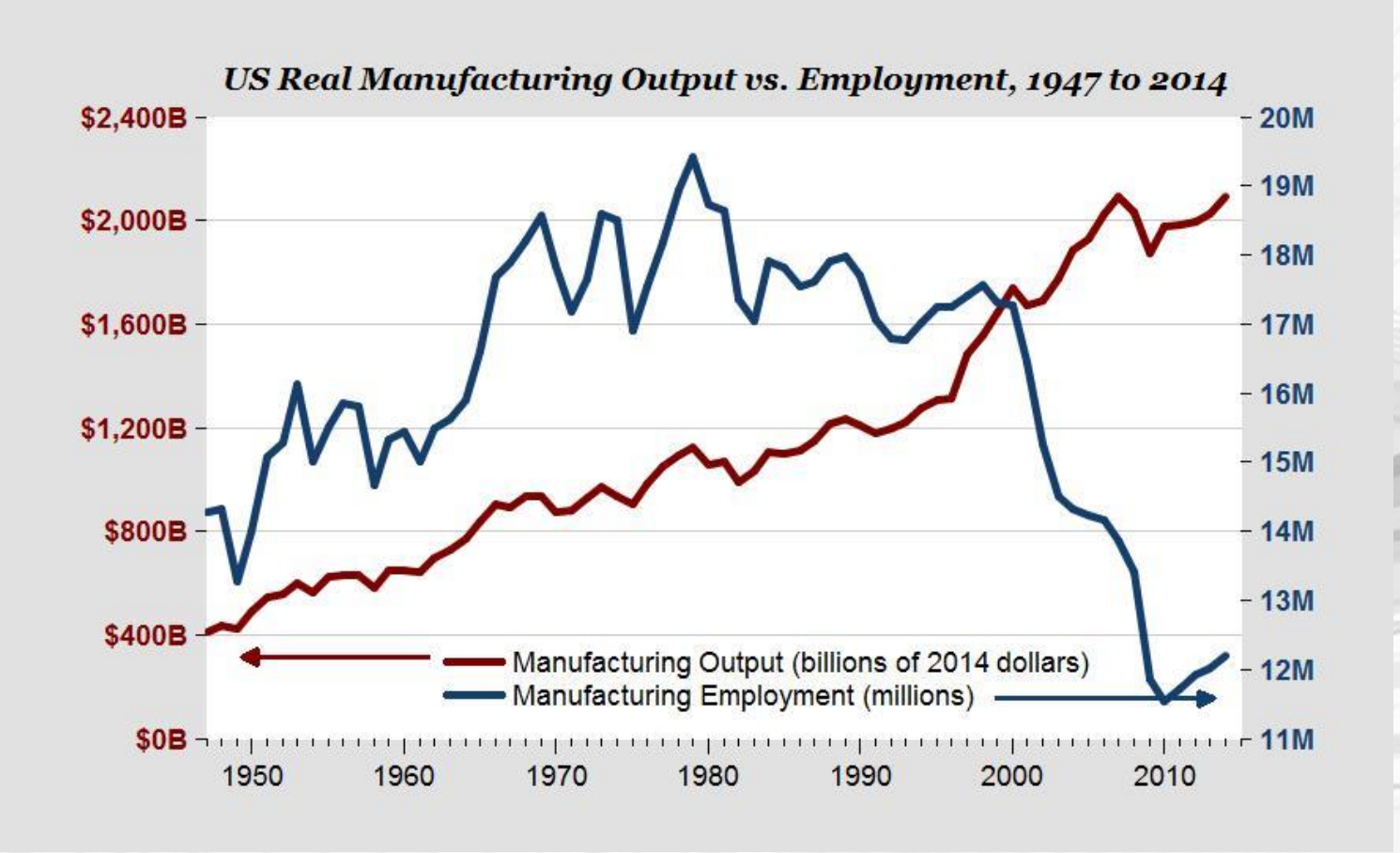
Manufacturing Productivity/Output



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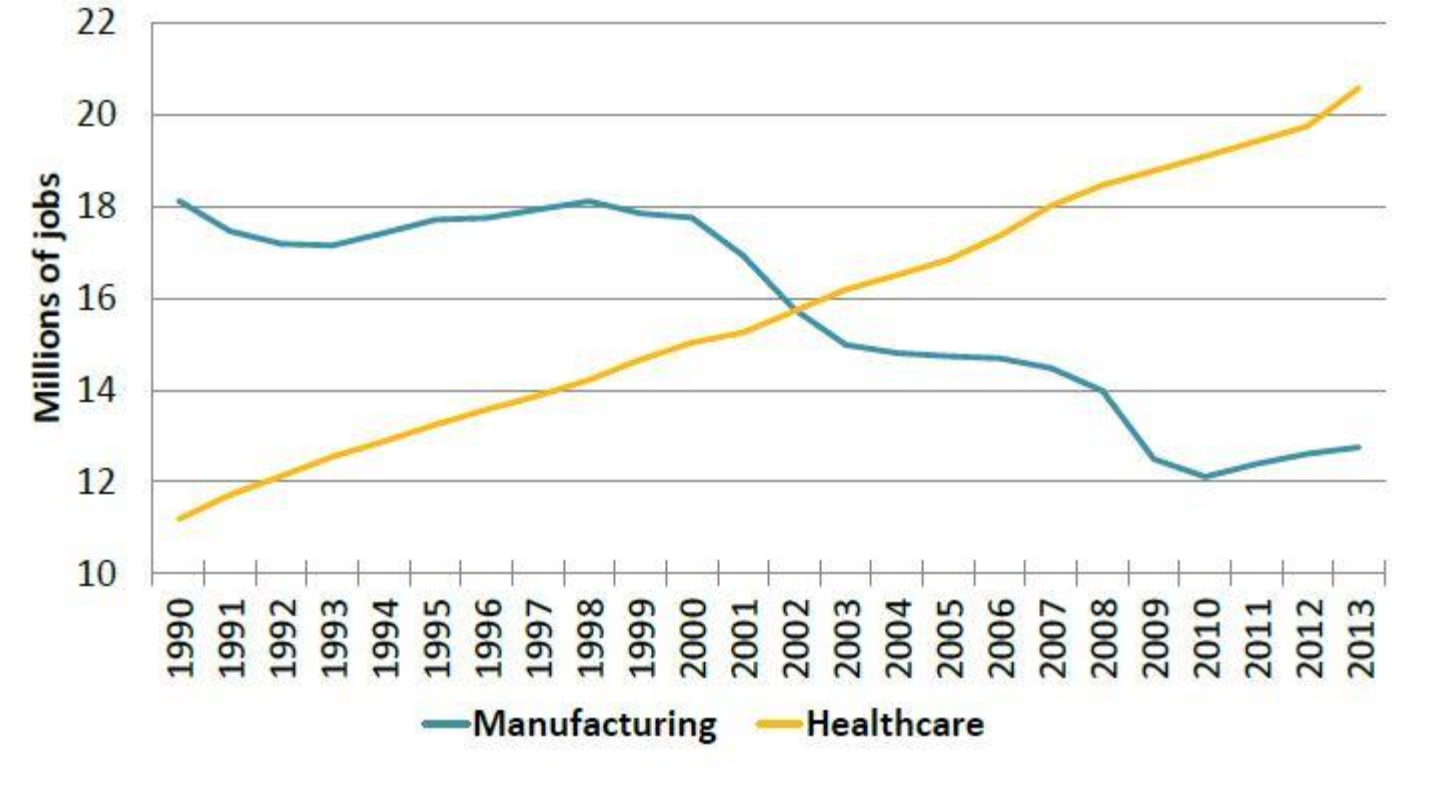
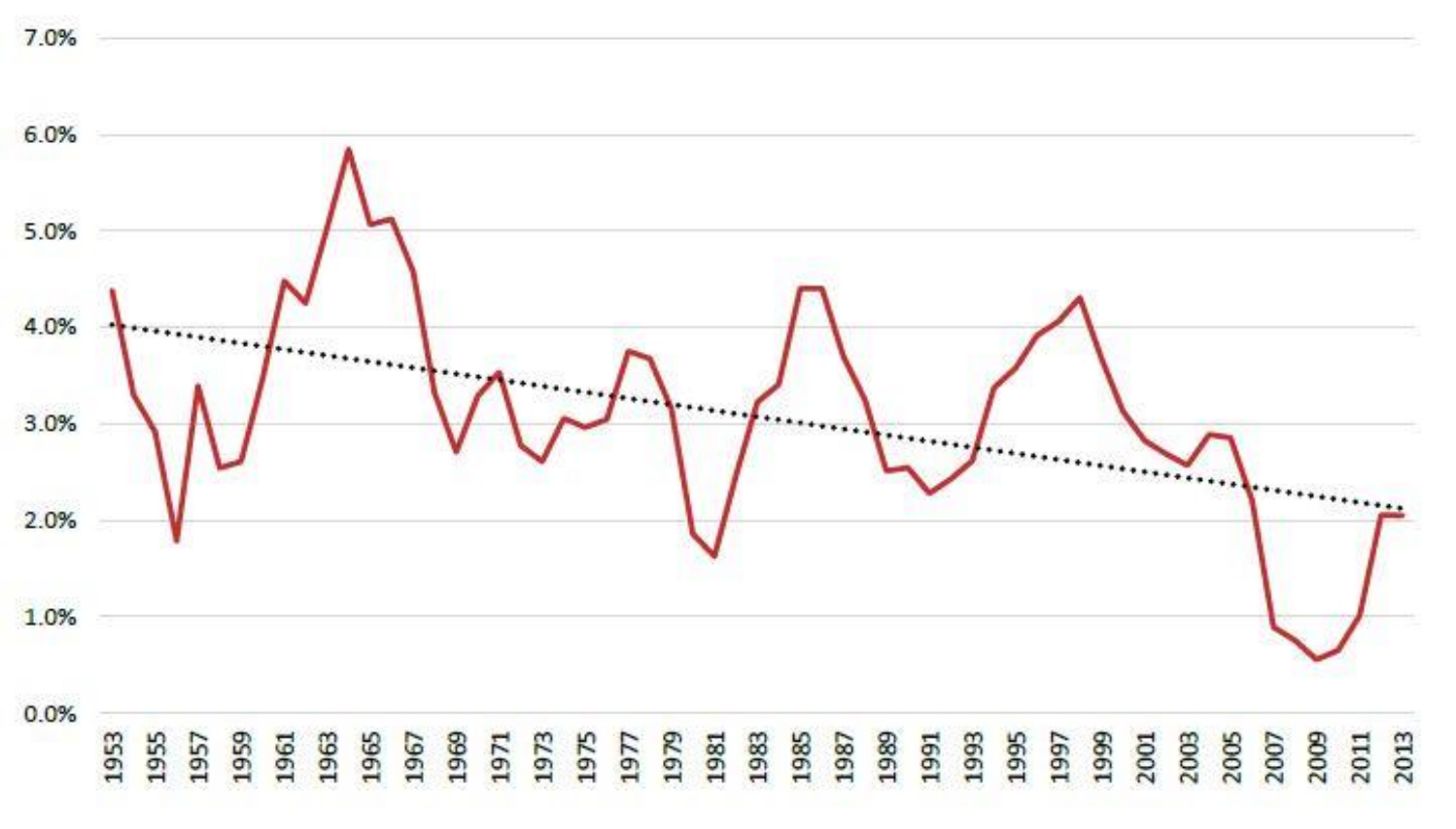
Manufacturing and Healthcare Employment



Output Growth



Cohort-Component

- = **Starting Population**
  + Natural Growth (+Births, -Deaths)
  + Net Migrants (+In, -Out)
  = **Ending Population**

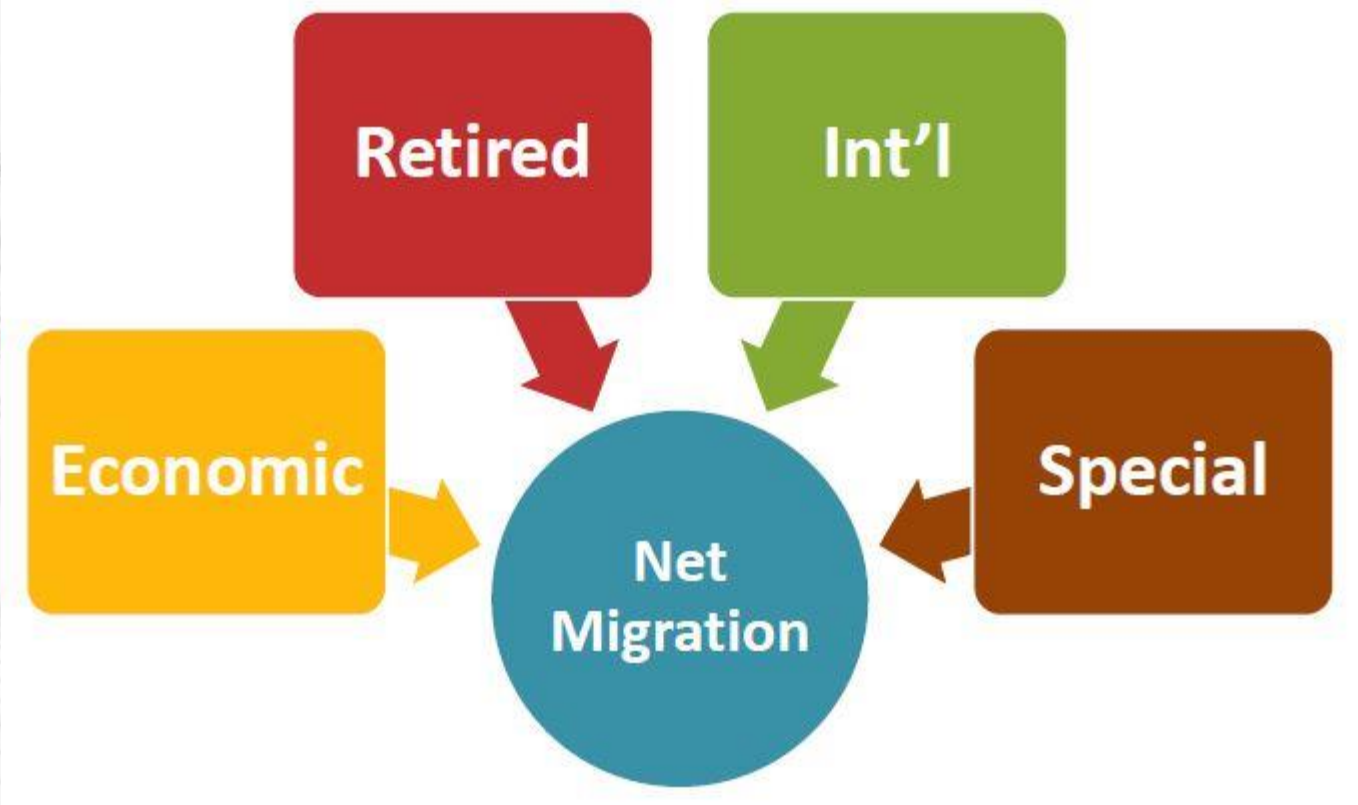
Region: Portland MSA

Category	Units	2015	2016
Starting Population	Thousands	1885.899	1899.318
Natural Growth	Thousands	9.079	8.793
Population Before Migrants	Thousands	1894.978	1908.111
Migrants	Thousands	4.340	6.638
Unexplained Growth	Thousands	0.000	0.000
Ending Population	Thousands	1899.318	1914.748

Demographics in the Model

- Sex: Male/Female
- Race: White-NonHispanic, Black-NonHispanic, Other-NonHispanic, Hispanic
- Age: 101 Age Cohorts from (0 – 100+)

Migration Concepts



Economic Migration

$$ECMG_t^l = \left[\lambda^l + \beta \ln\left(REO_t^l\right) + \beta \ln\left(RWR_t^l\right) + \beta \ln\left(MIGPROD_t^l\right)\right] * LF_{t-1}^l$$

ECMG = Net Economic Migration

REO = Relative Employment Opportunity

RWR = Relative (Real) Wage Rate

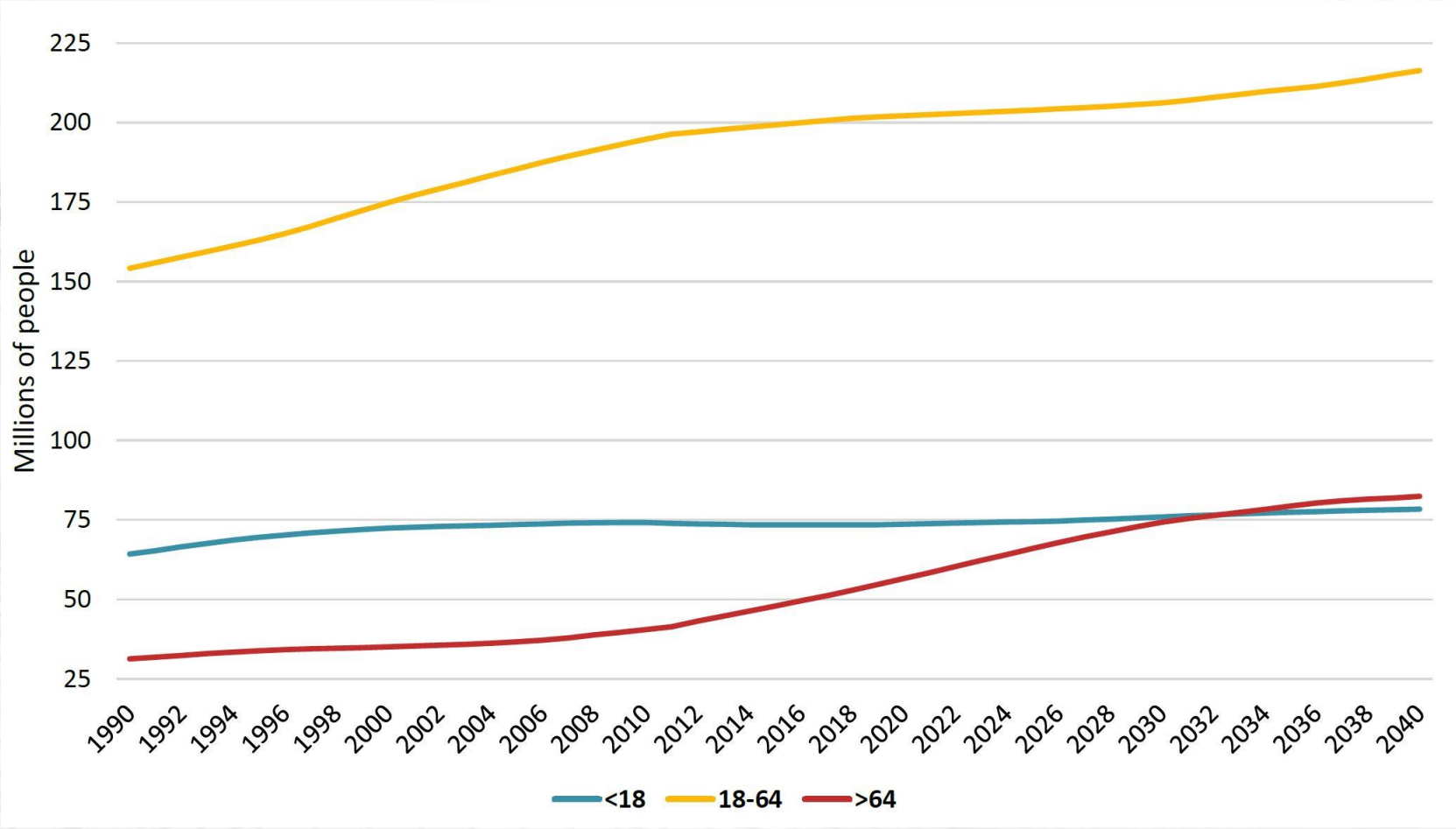
MIGPROD = Consumption Access

Lambda = Fixed Amenity

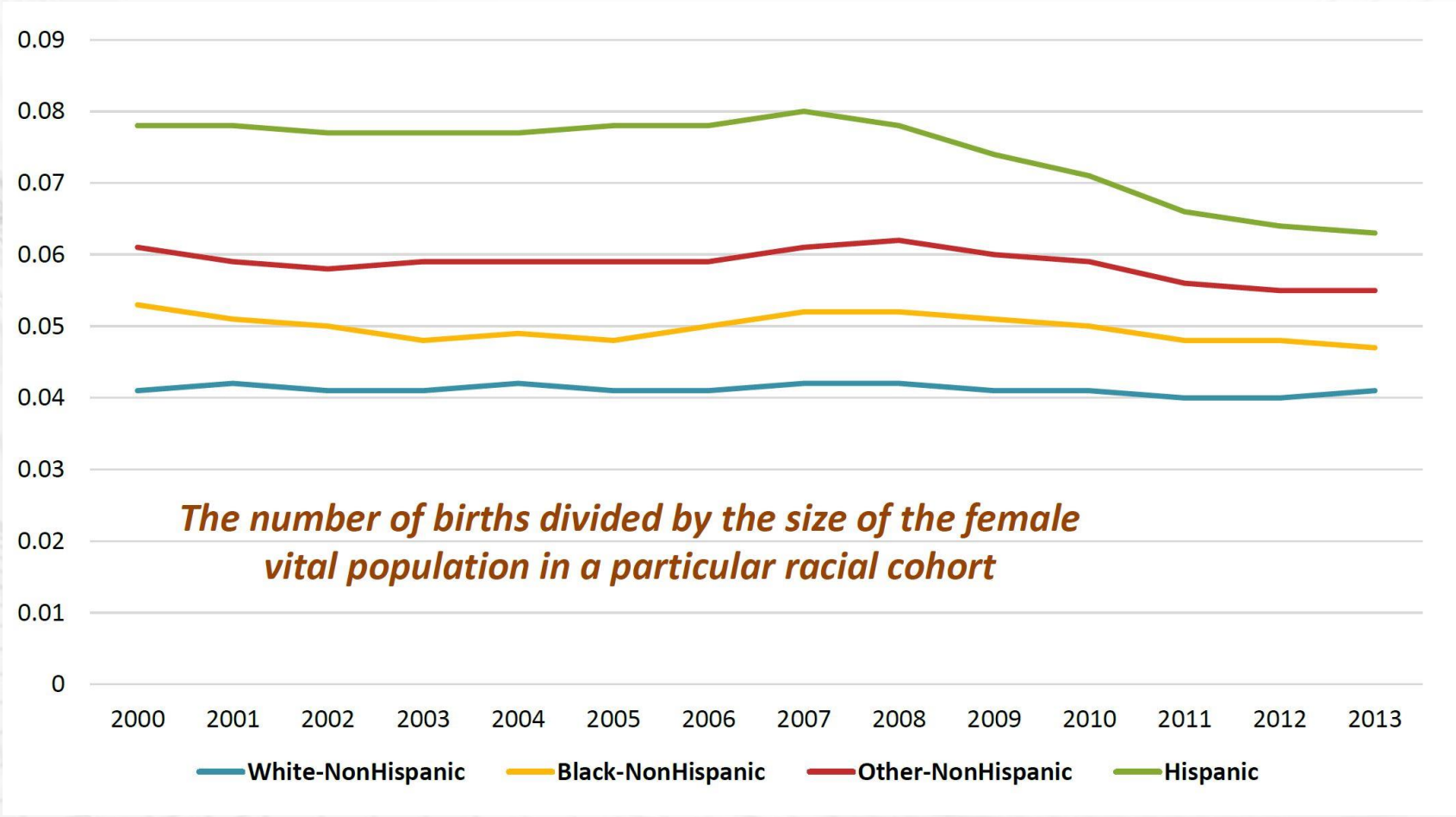
Exogenous Concepts

- International Migrants:
  - Based on historical patterns
  - Many of the determinants of international migration are not closely tied to regional factors (economic/political conditions of foreign countries, available visas for U.S. immigration)
- Special Populations:
  - These demographic groups don't respond to changes in labor market conditions

Demographic Trends Across Generations



Birth Rates



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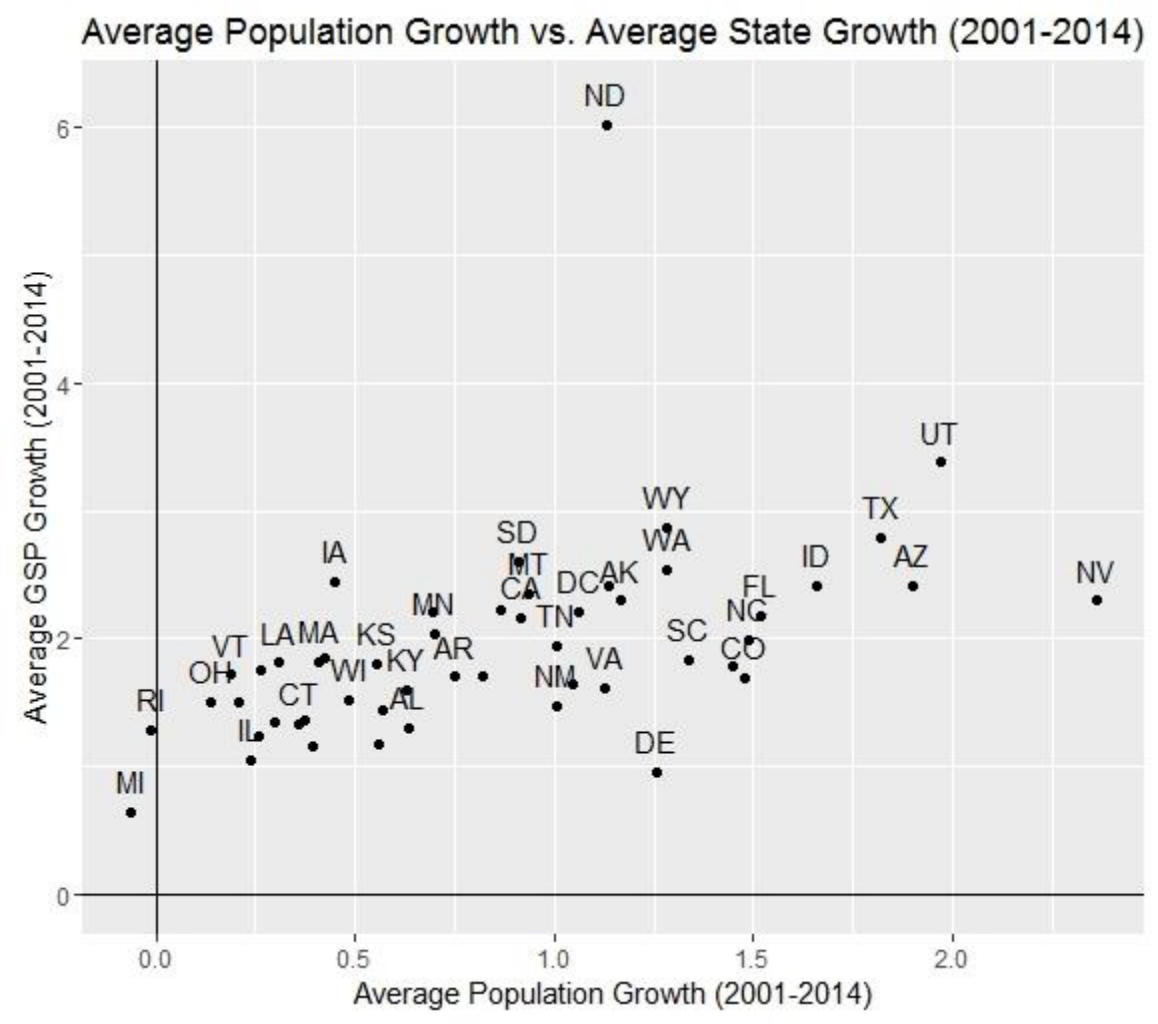
Summary

- Labor force growth and productivity growth have had very large effects on economic growth
  - Productivity growth was very strong in the mid 20th century but has slowed down since the early 1970s
- Growth in the labor force is about to slow down dramatically, and coupled with slowing productivity growth there is potential for an economic slowdown

Growth Matrix (2001-2014) Avg.



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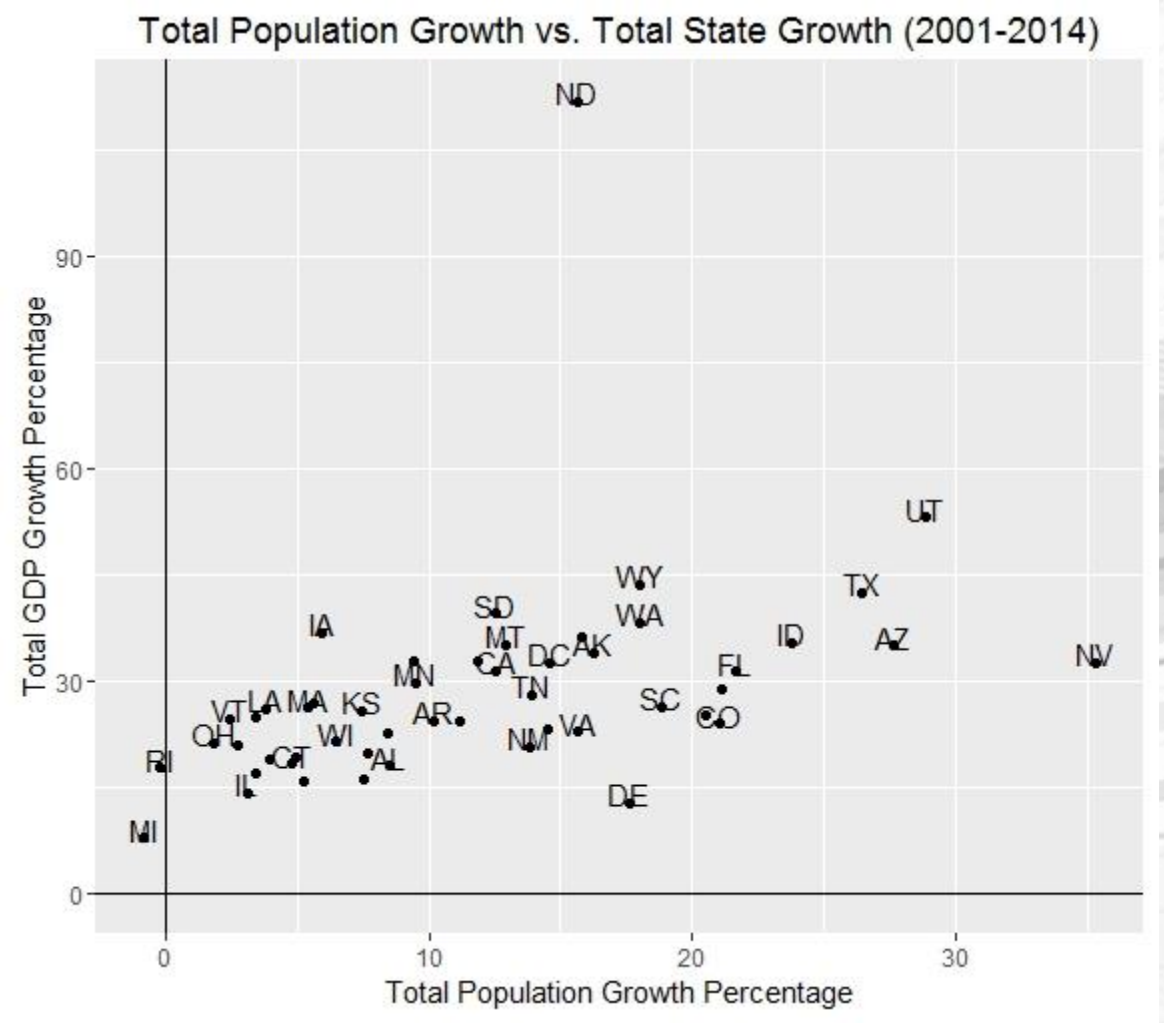
Growth Matrix (2001-2014) Total



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Policy Implications

- National and regional population forecasts should become far less aggressive than in the past
  - Less demand for public infrastructure, schools, and a very different situation for planners
- The federal budget is going to face much more competition for resources than in the past
  - Defense, infrastructure, education, and research will be squeezed out by legally-mandated entitlements, primarily healthcare and transfers to retirees via Social Security
- Demographics is a strong predictor of growth