Dutch Disease or Agglomeration? The Local Economic Effects of Natural Resource Booms in Modern America

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Local Economic Impacts of Oil and Gas Booms

"**It's hard to think of what oil hasn't done to life** in the small communities of western North Dakota, good and bad.

Locals hope that unlike the boom of the 1970s and early 1980s, this boom "won't afflict the state with the so-called **Dutch Disease** in which natural-resource development and the sugar rush of fast cash paradoxically make other parts of the economy less competitive and more difficult to sustain."

-"North Dakota Went Boom."
The New York Times Magazine, January 31, 2013

The Resource Curse

- Standard trade models: If no market failures, increases in resource prices benefit resource-abundant regions
- Resource Curse: Market failures interact with resource production to reduce growth
- One potential mechanism: Dutch Disease
  - Resource boom decreases manufacturing output
  - Manufacturing contraction reduces long-term productivity due to forgone local TFP spillovers
    - Greenstone, Hornbeck, and Moretti (2010), Kline and Moretti (2013)
    - Common assertion: Little TFP spillover from resource extraction to manufacturing
- But can resource extraction drive manufacturing growth?
  - Wright and Czelusta (2007), David and Wright (1997)
- Many existing studies, but poor data, conflicting results

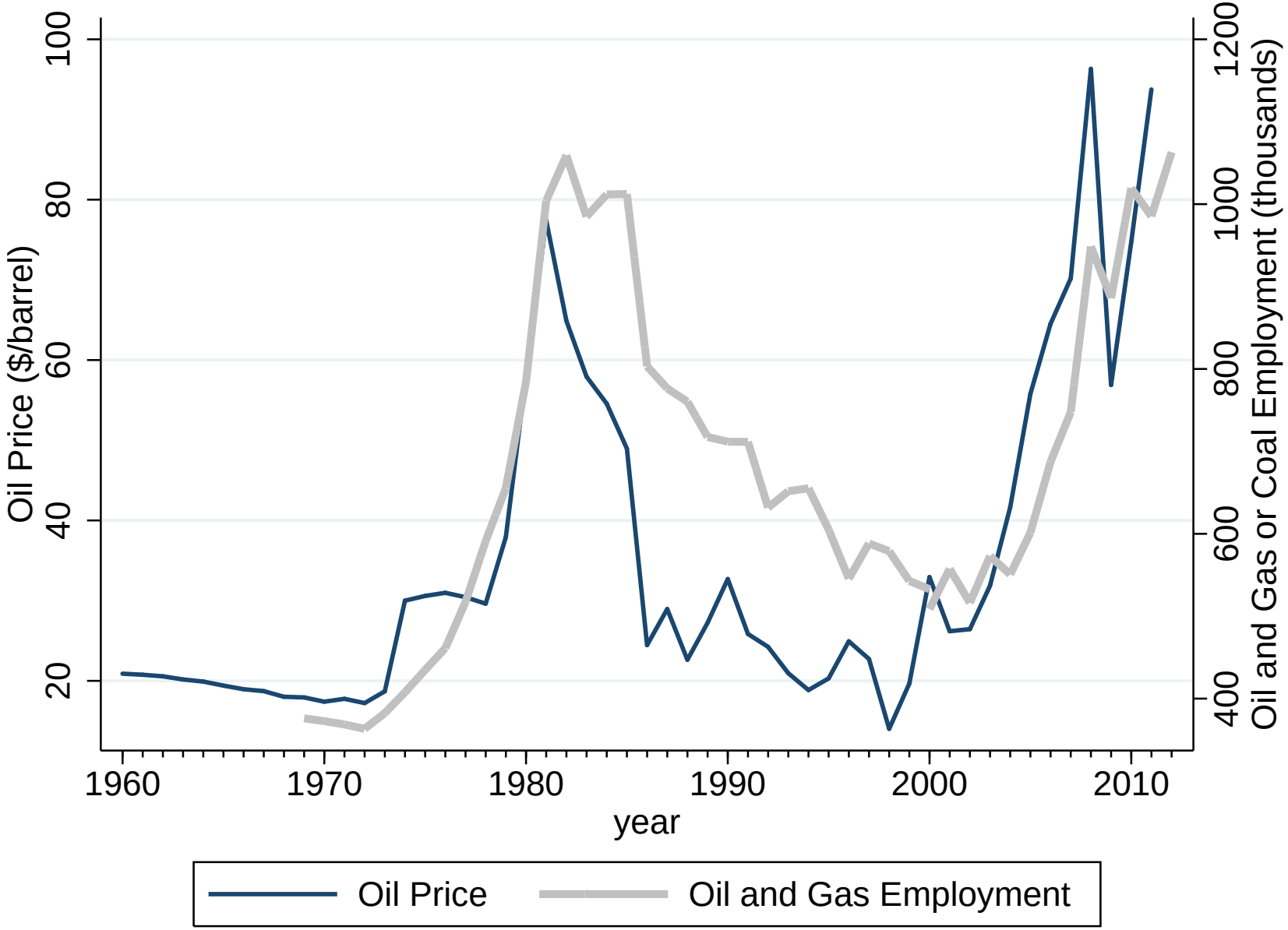
Our Questions

1. *How do oil and gas booms and busts differentially affect economic growth in resource-abundant U.S. counties?*
2. *Does manufacturing contract during oil and gas booms?*

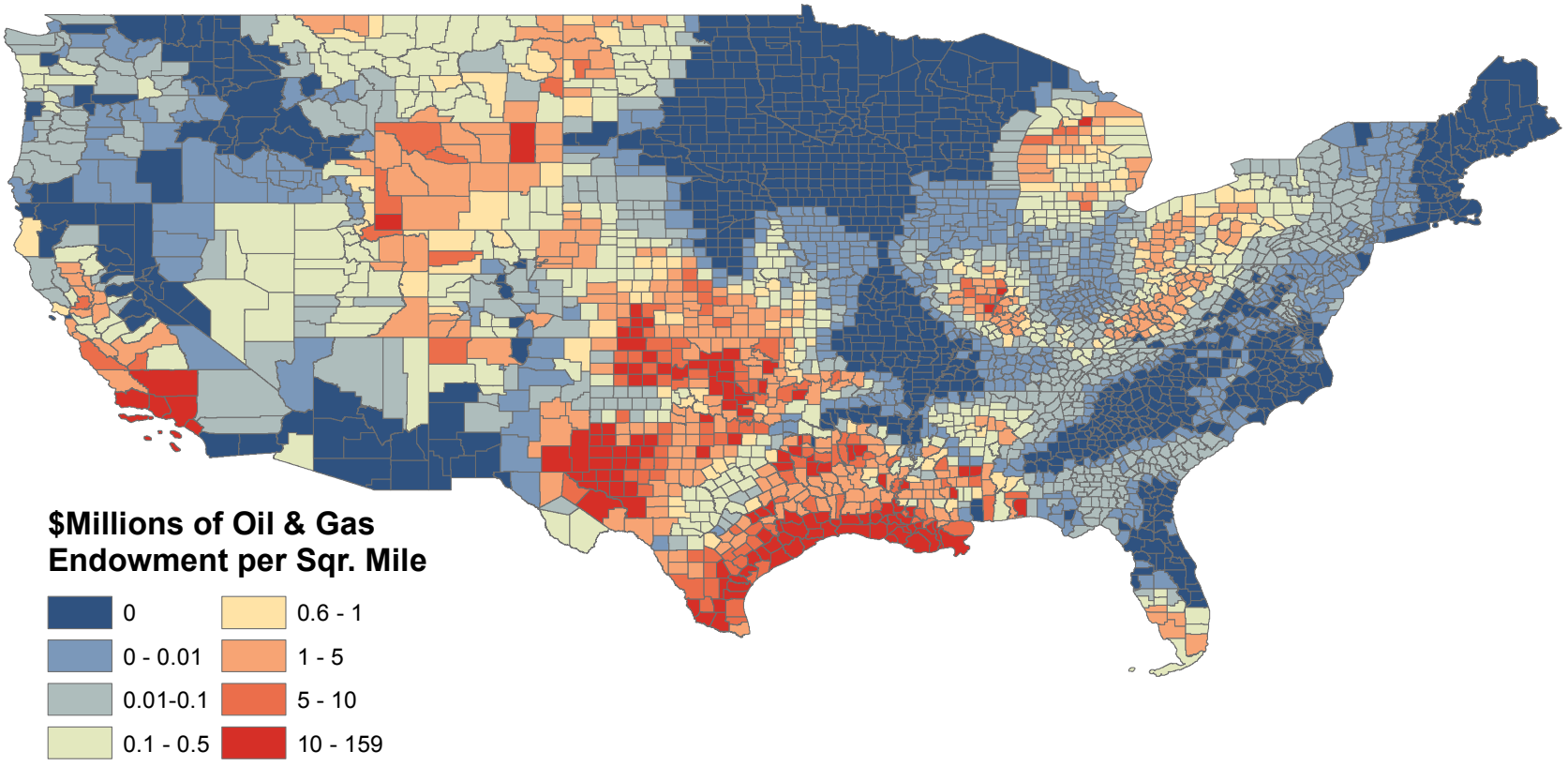
Our Approach

1. Remarkable data
   1.1 New county-level dataset of oil and gas resources
   1.2 Standard publicly-available local economic data
   1.3 Restricted-access microdata from U.S. Census
2. "Bartik" identification
   2.1 Geographic variation in resource abundance
   2.2 Time series variation in booms and busts
3. Better data + clean econometrics = surprising results

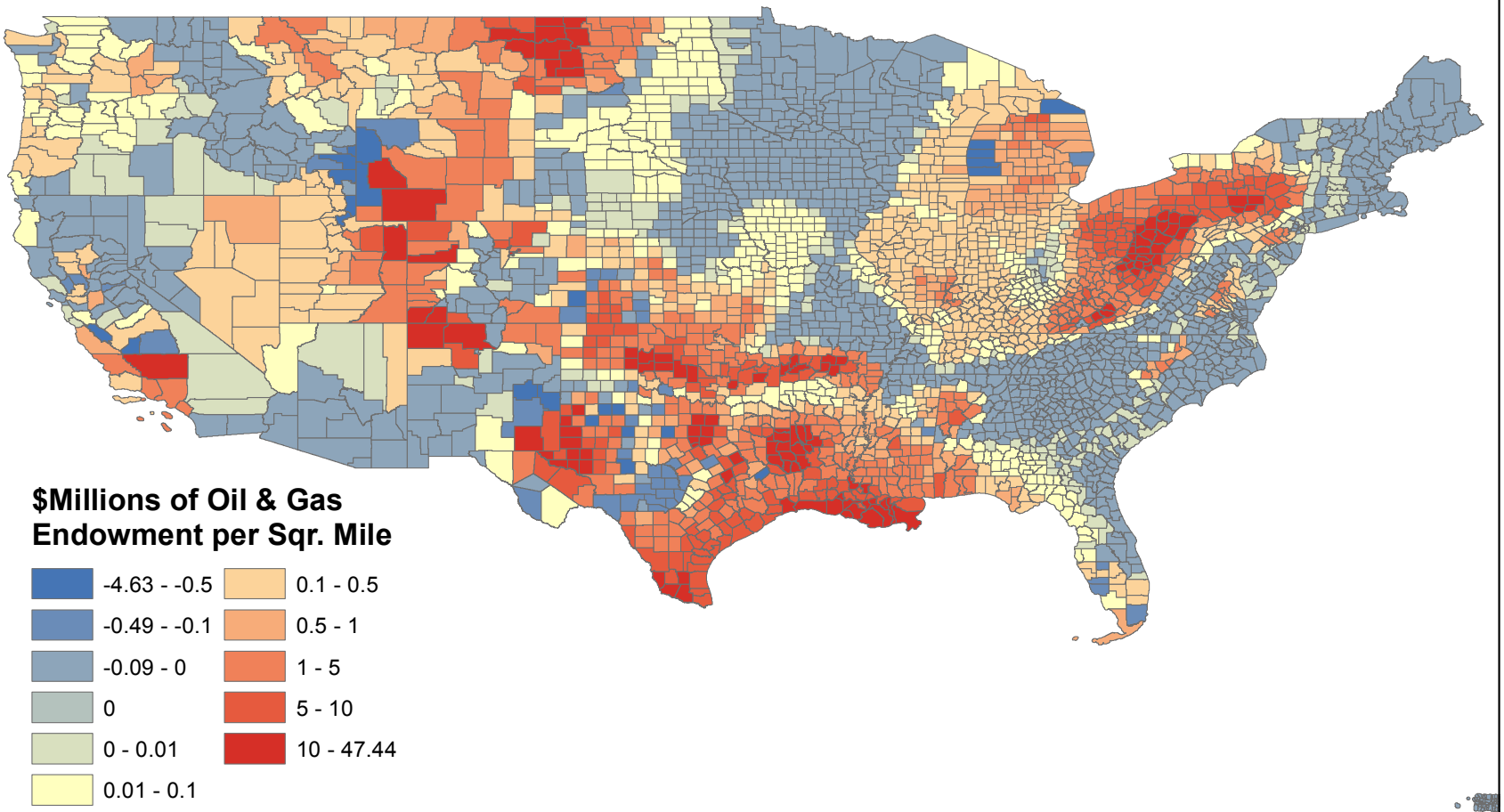
Background: Oil and Gas Booms in Modern History



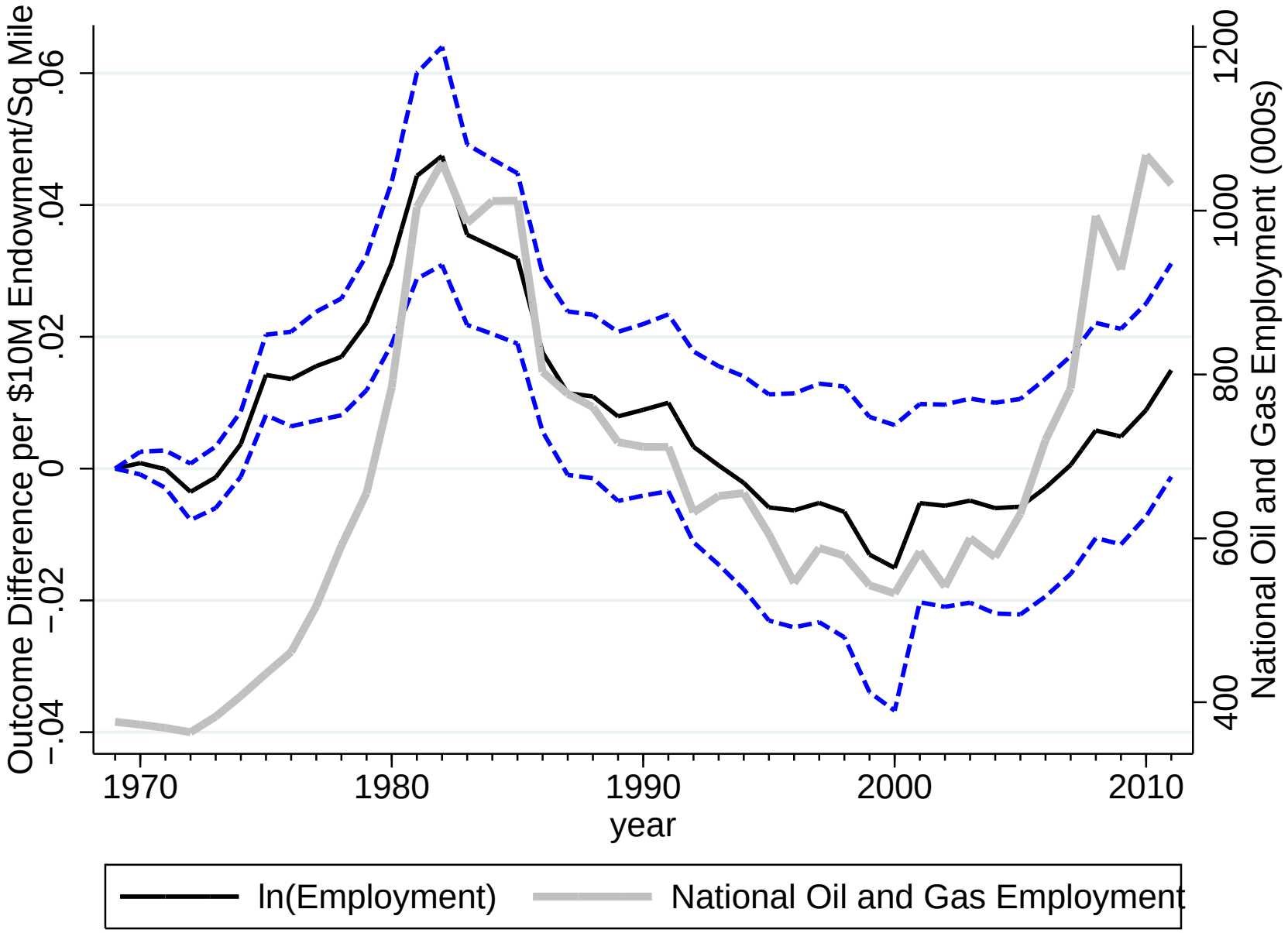
Pre-2000 Endowment per Square Mile



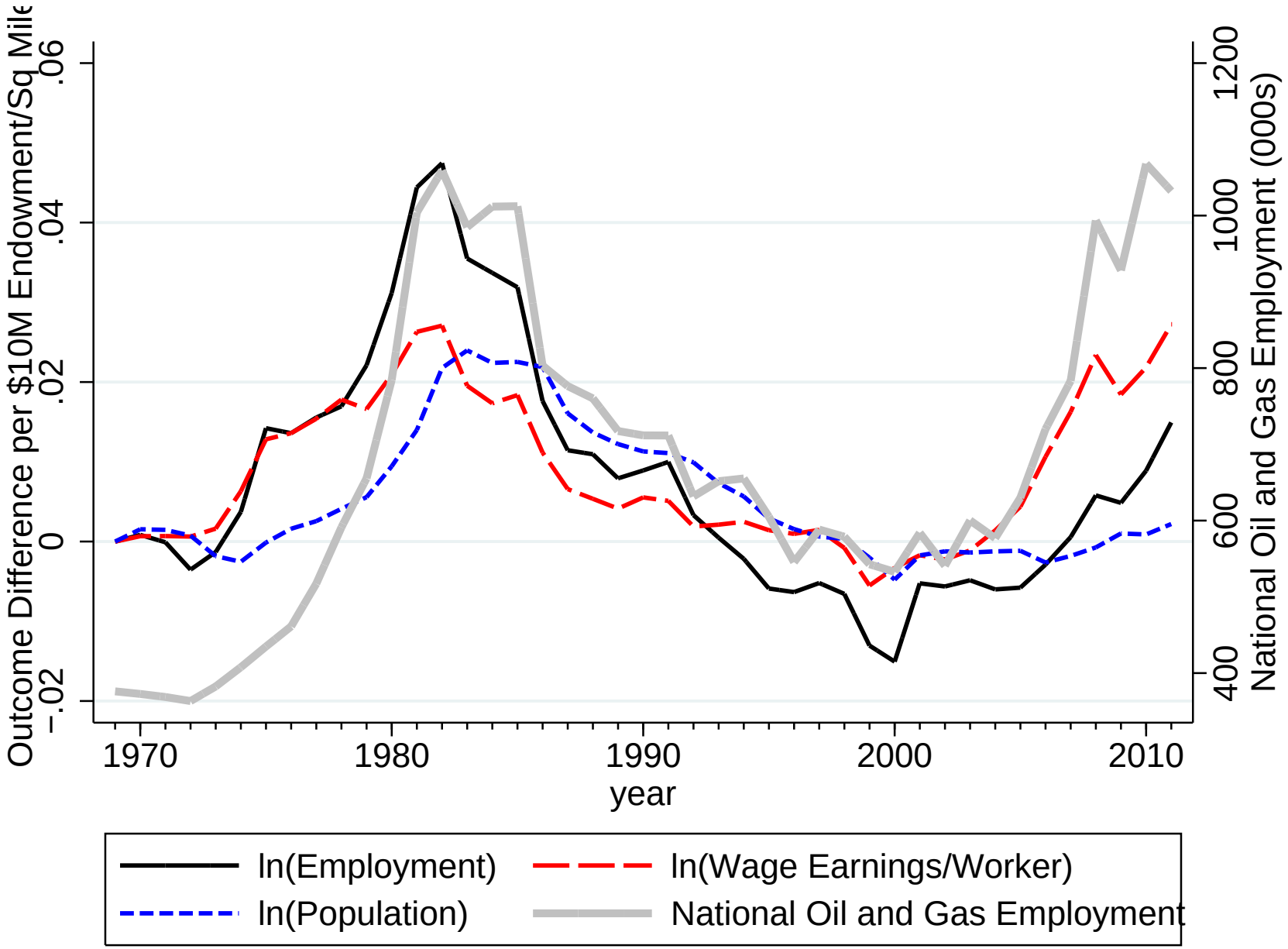
Change in Endowment Post-2000



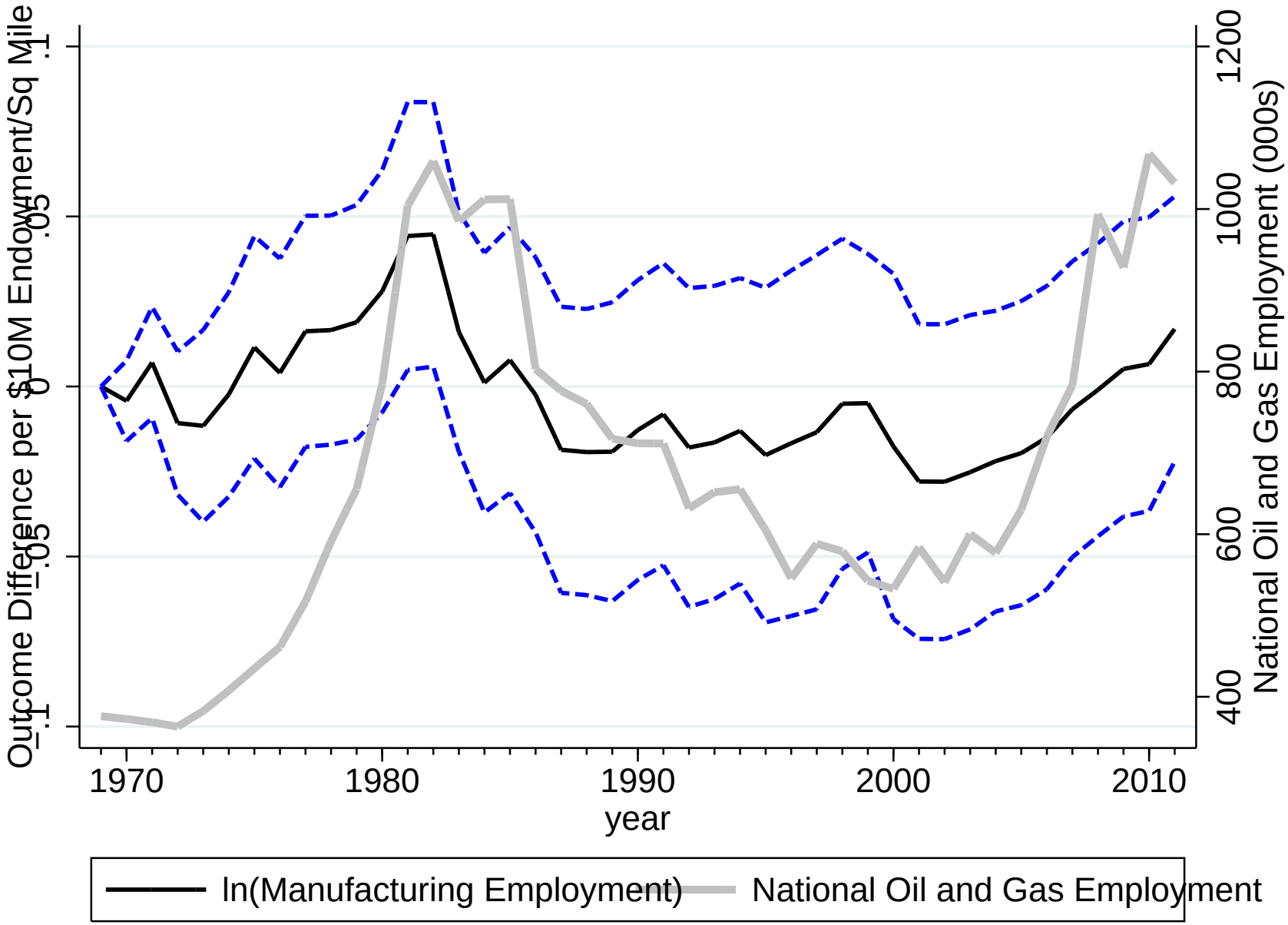
Graphical Results: Employment



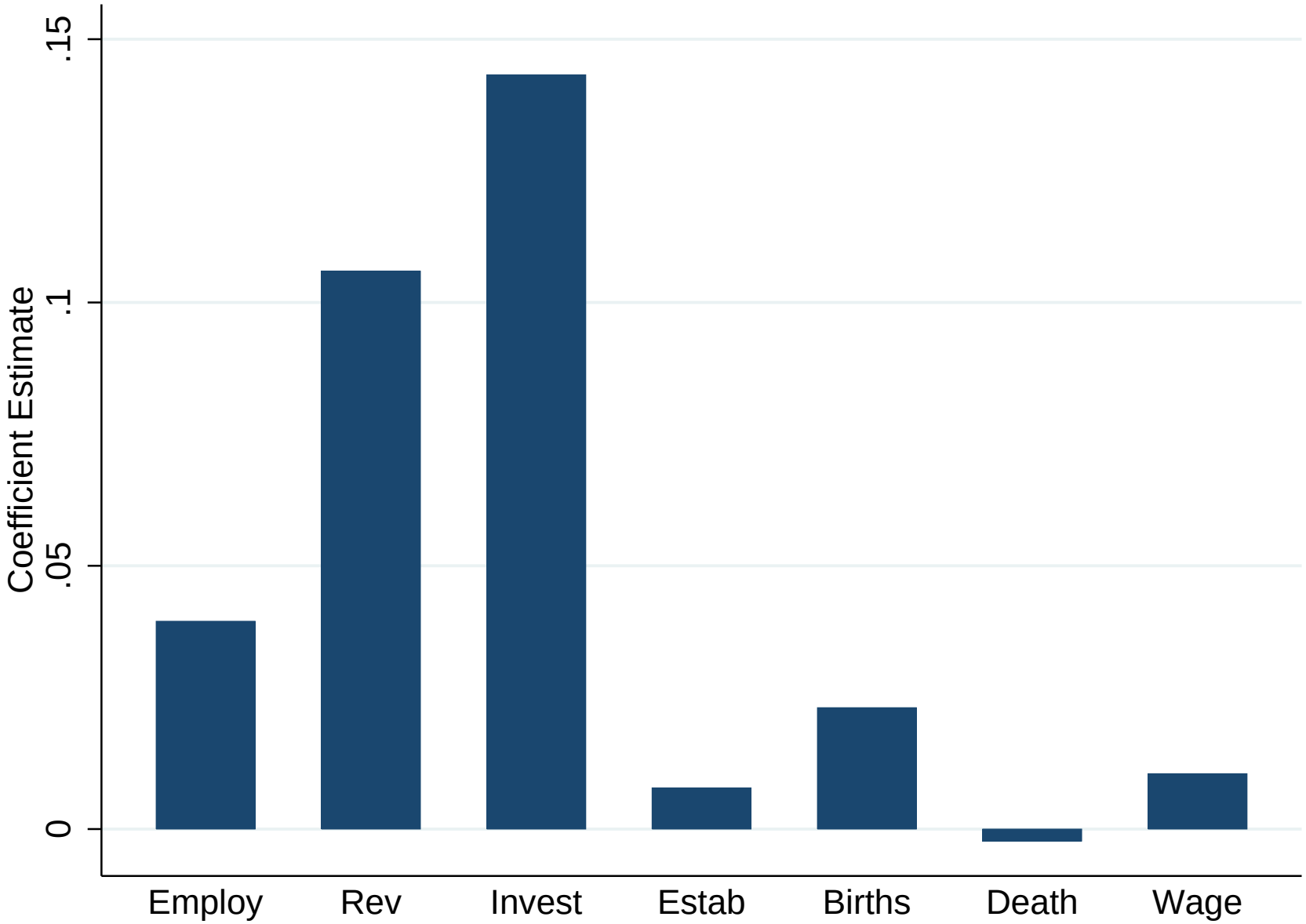
Clear Aggregate Growth Effects



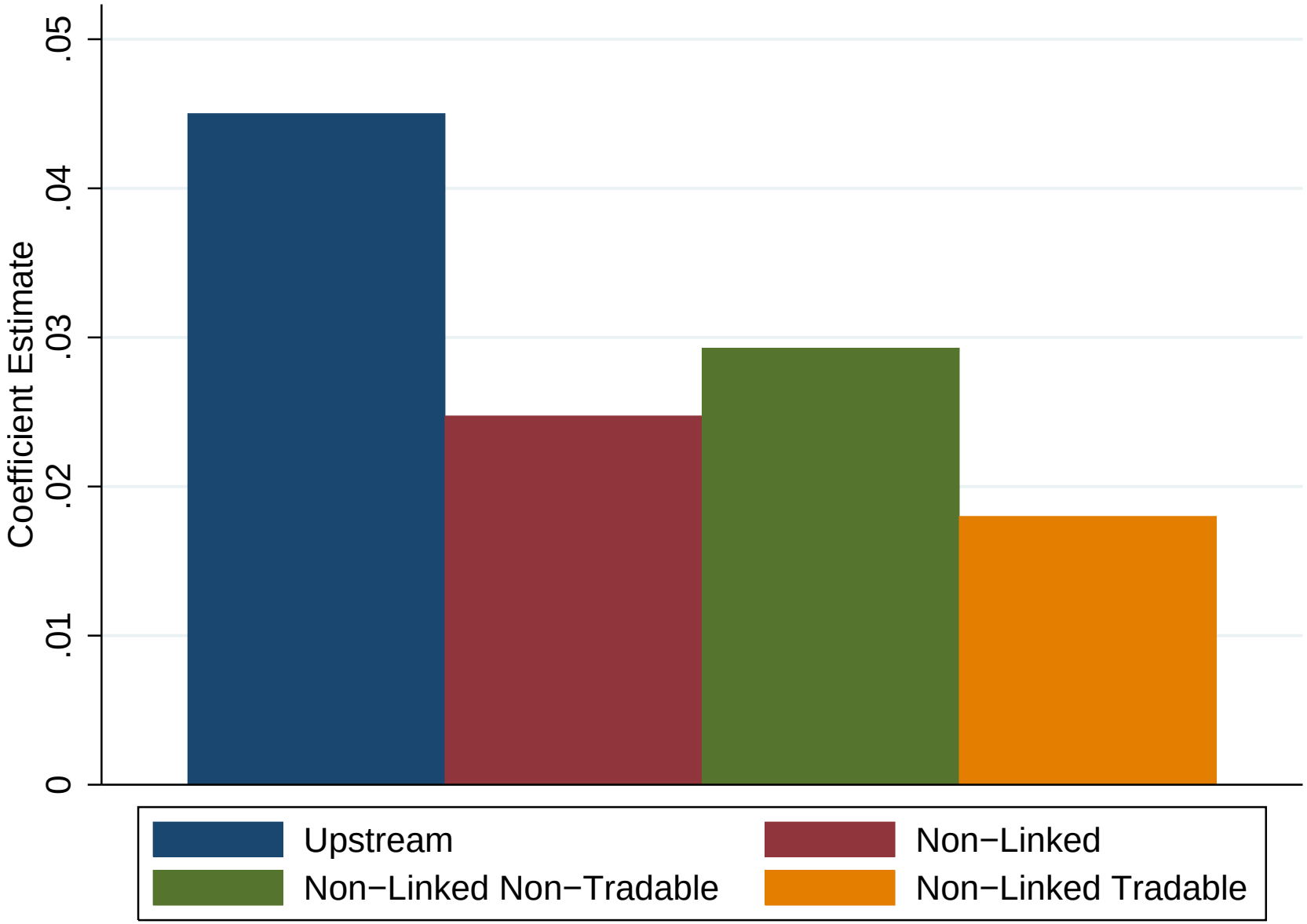
Manufacturing Employment Pro-Cylical with Resources



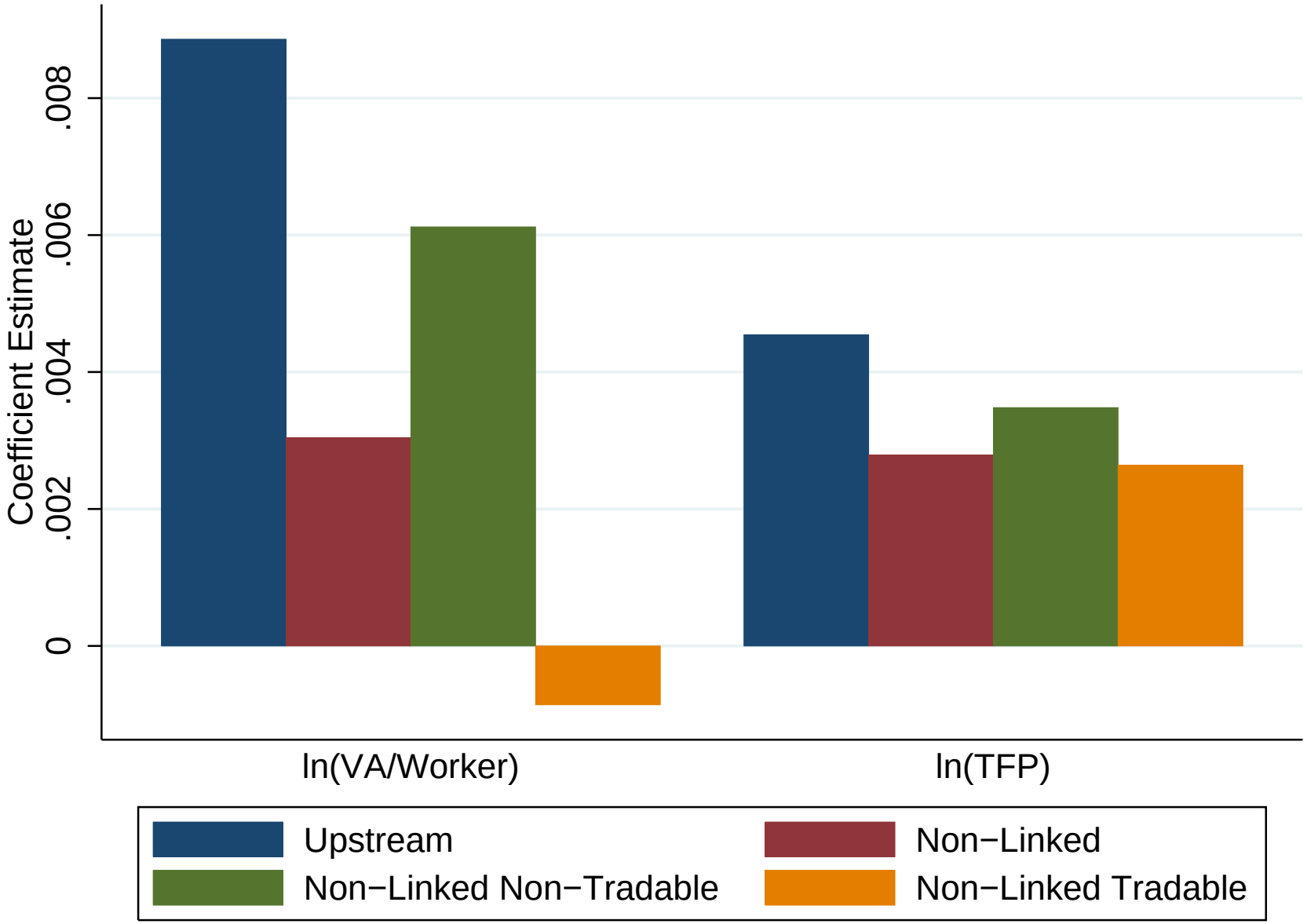
Alternative Outcomes Consistent with Employment



Employment Growth for Upstream/Local Plants



Manufacturing Productivity Pro-Cylical with Resources



Why No Dutch Disease?

- Point estimate: Wages rise less for non-linked non-tradable plants
- Wages don't increase by enough to substantially reduce profits
  - County aggregate wages averaged 1.6 percent higher for counties with one standard deviation additional endowment between 1975 and 1985, relative to the 1969 levels
    - Conservative: May overstate wage increases for non-linked tradable plants
  - Average labor input revenue share ≈ 0.25.
  - $\Rightarrow$Total input costs increased by 0.4 percent of revenues
  - Not large, although:
    - Much larger share of profits
    - Other local input costs may have risen
- Revenue productivity increases. Why?
  - Output price increases? No evidence of this
  - MORG data: Worker transitions from oil & gas to manufacturing rare
  - Point estimates: Productivity gains larger for linked industries
    - Lower transport costs for goods?

Conclusion: Takeaways

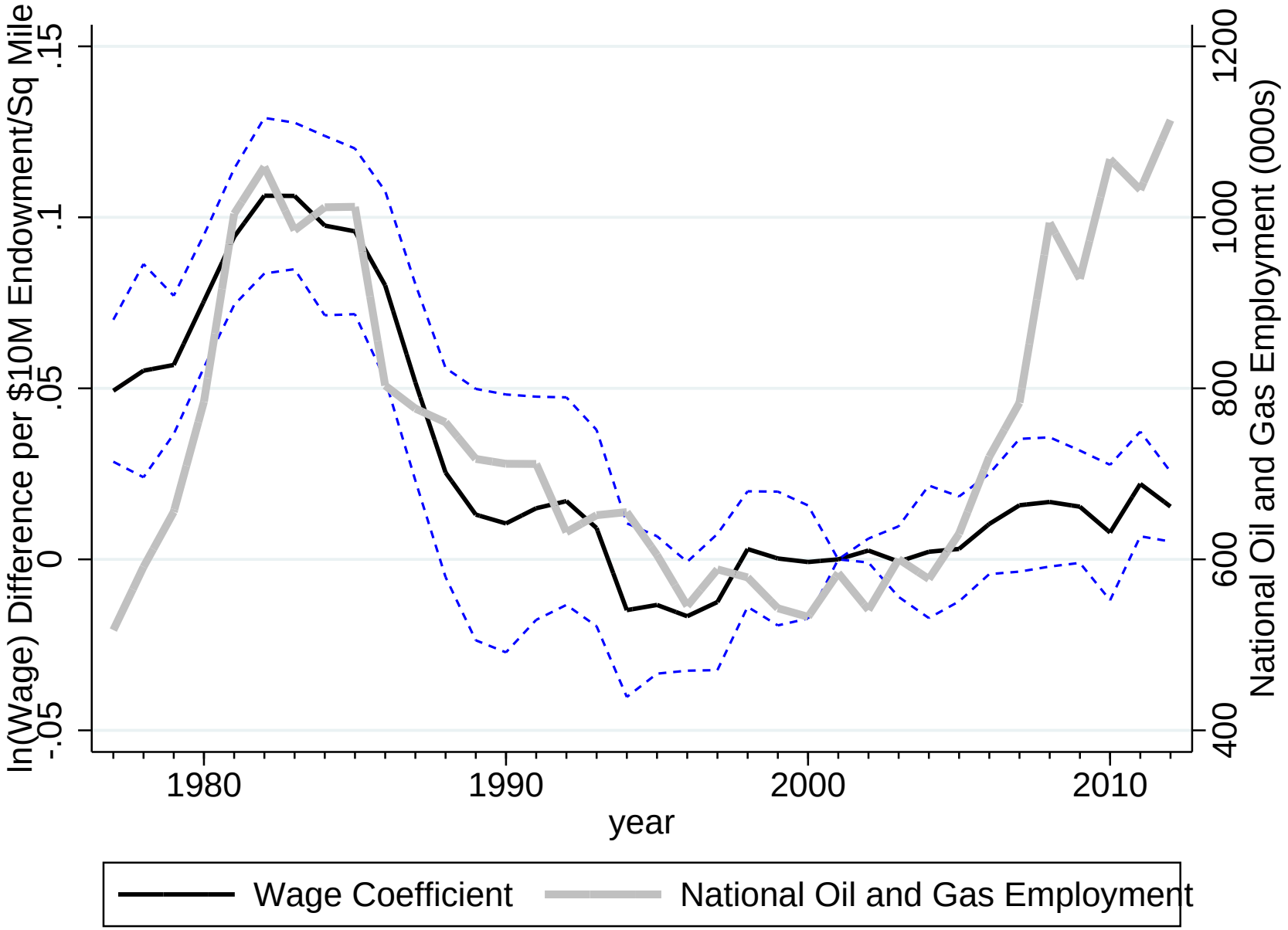
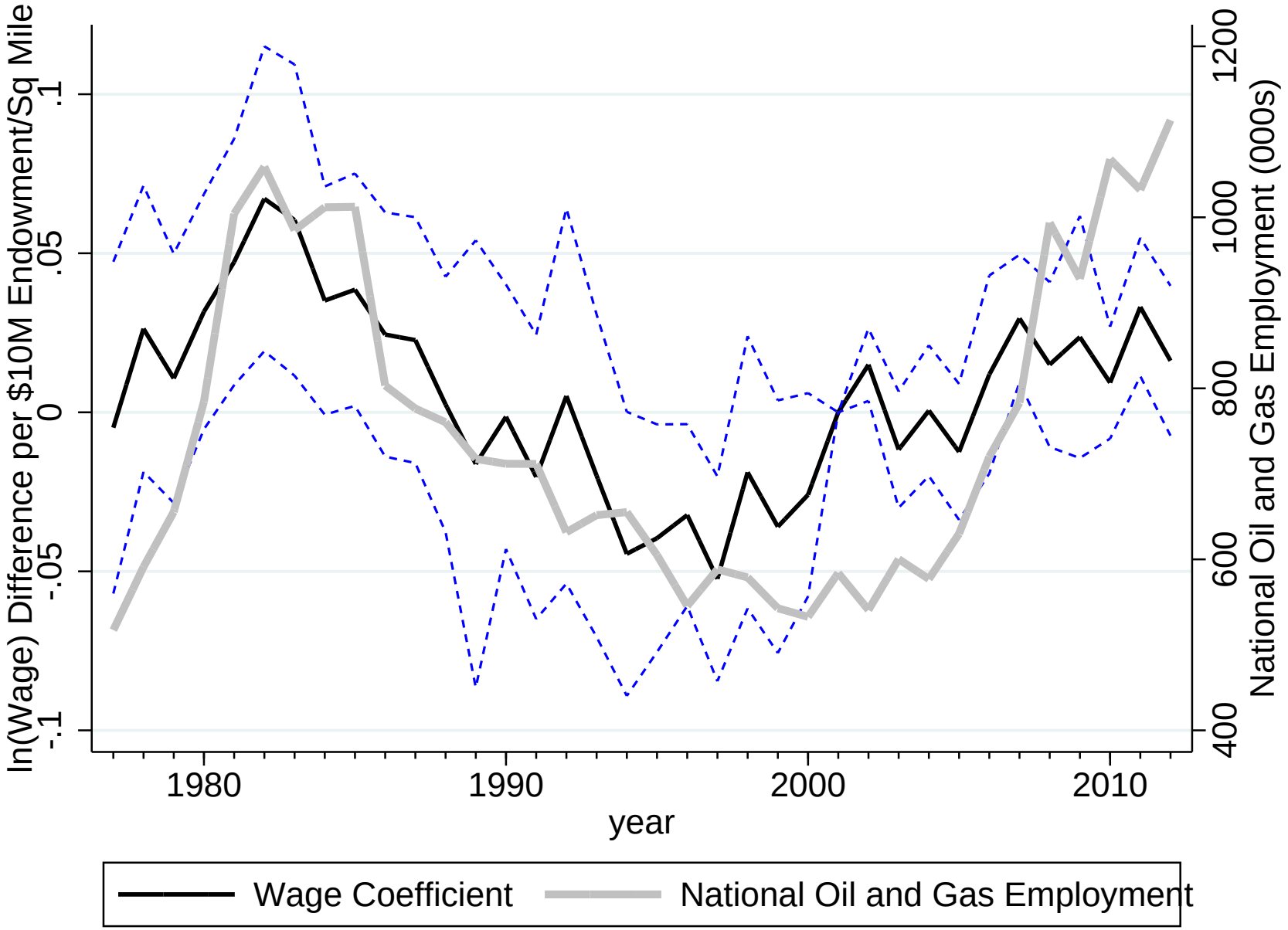
1. Resource booms can significantly increase growth
2. Clearly reject the idea of Dutch Disease within the U.S.
   2.1 Despite wage increases, manufacturing is pro-cyclical with resource booms
3. A meaningful share of manufacturers benefit from very local demand growth
4. Counter the argument that natural resource extraction is unlikely to drive productivity growth
   4.1 Significant growth in linked manufacturing
   4.2 Positive spillovers to revenue TFP, potentially physical TFP

Initial Manufacturing Sector Composition

Table: **1967/69 Baseline County Characteristics**

	Mean (000s)	Association with Endowment
Manufacturing employment	5.99	.090*
		(0.052)
Upstream manufacturing employment	1.63	0.156**
		(0.058)
Non-linked manufacturing employment	4.35	0.033
		(0.054)
Non-linked local manufacturing employment	1.16	0.015
		(0.050)
Non-linked tradable manufacturing employment	3.19	0.029
		(0.064)

CPS Wage Regressions: All Workers



CPS Wage Regressions: Manufacturing Only