Discussion:
Estimating Who Benefits From Productivity Growth
By: Hornbeck and Moretti

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Summary

1. Estimate 1977-87 city-level TFP growth in Census of Manufacturers as in Greenstone, Hornbeck, Moretti (2010).
2. Instruments: shift share, export exposure, patents, stock returns.
3. Direct effect: response of employment, wages, prices to city TFP.
4. Indirect effect: employment$\uparrow \Rightarrow$ workers migrate in from elsewhere, source cities affected too.
5. Indirect calculation: historical migration patterns + external assumptions on elasticities of wages and rents to number of workers.

Findings

1. Low skill have larger direct effects because less mobile.
2. Renters have smaller direct effects because local rents rise.
3. High skill have larger indirect effects because more mobile.
4. Renters have larger indirect effects because local rents fall.
5. Overall benefits more evenly distributed than direct benefits.

Comments

1. Great paper!
2. Really!
3. Suggestions for additional robustness.
4. "Empirical" indirect effects versus general equilibrium model.
5. Investment price, consumer surplus, and framing.

Comment: causal identification with Bartik

P.3: "Identification assumption is that cities concentrated in particular industries would have changed similarly to other cities if not for those industries experiencing differential shocks."

- Things we might be concerned about:
  - TFPR, not TFPQ.
  - Other shocks correlated with (or cause) TFPR, e.g. military spending.
  - Manufacturing and non-manufacturing industry shocks correlated.
- Four statistically distinct instruments seems great. But:
  - Not clear what independent variation each captures. Maybe low correlation reflects common component plus noise.
  - Patent (first stage F=5.86), export (first stage F=6.31), combined (first stage F=9.48) instruments weak.

1977-1987 industry TFP (NBER prod. database)

Most negative		Most positive	
Sector	TFP growth	Sector	TFP growth
Oil and Gas Field Machinery	−68.8	Computer Storage Device	165.0
Cigarette	−56.9	Electronic Computer	161.7
Jewelry (except Costume)	−48.7	Computer Terminal	141.9
Irradiation Apparatus	−43.6	Other Computer Peripheral Equipment	133.1
Rolling Mill Machinery and Equipment	−36.7	Magnetic and Optical Recording Media	87.4
Electromedical and Electrotherapeutic Apparatus	−35.3	Coffee and Tea	77.4
Fabricated Pipe and Pipe Fitting	−32.8	Semiconductor and Related Device	60.6
Farm Machinery and Equipment	−32.4	Ammunition (except Small Arms)	48.0
Leather and Hide Tanning and Finishing	−32.3	Electrometallurgical Ferroalloy Product	44.6

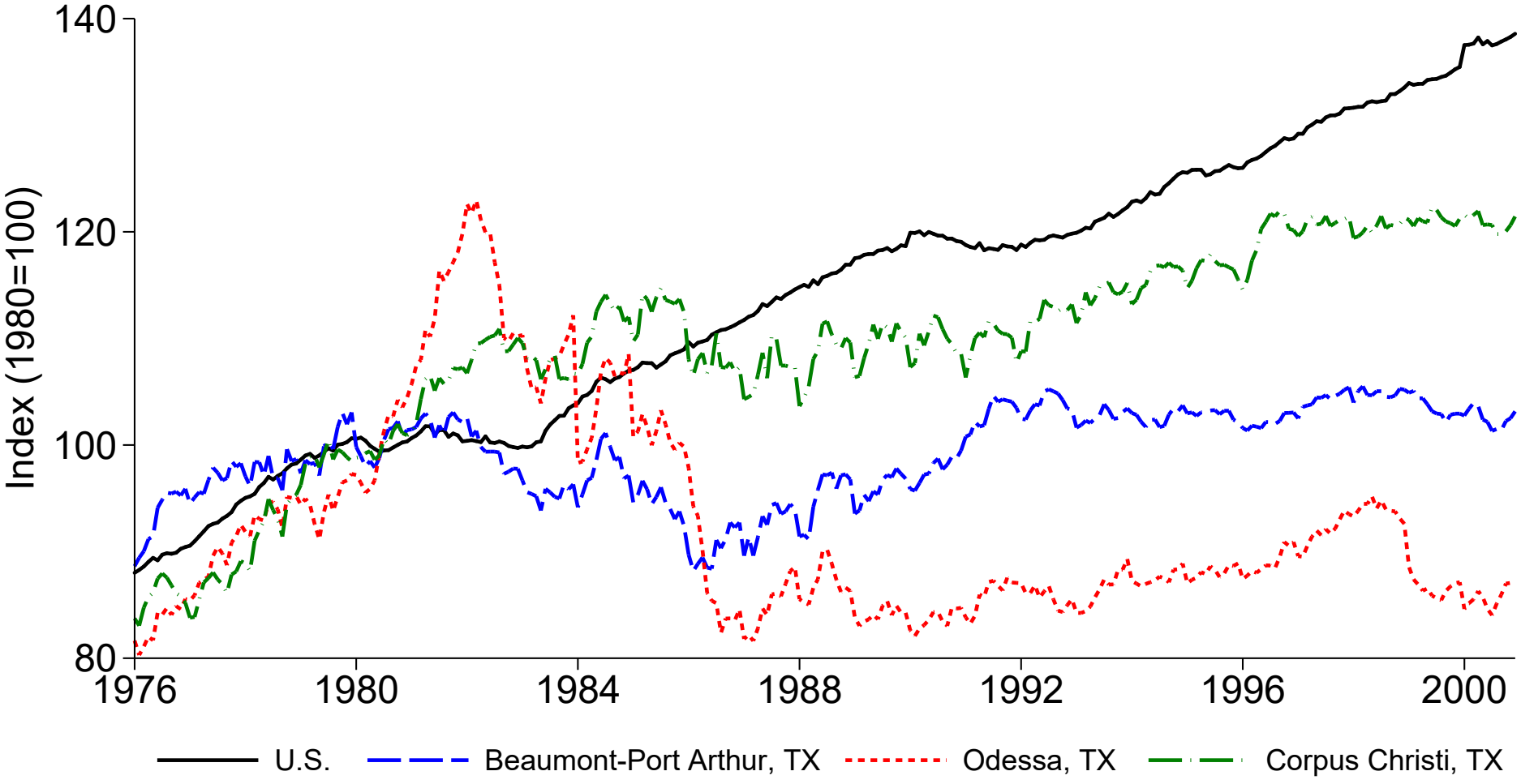
Cities with worst TFP growth by instrument

Smallest Values				
1.	Bakersfield, CA	Billings, MT	Beaumont-Port Arthur,TX	Eugene-Springfield, OR
2.	Beaumont-Port Arthur,TX	Montgomery, AL	Corpus Christi, TX	Waterloo-Cedar Falls, IA
3.	Corpus Christi, TX	Mobile, AL	Billings, MT	Detroit, MI
4.	Billings, MT	Alexandria, LA	Bakersfield, CA	Peoria, IL
5.	Galveston-Texas City, TX	Augusta-Aiken, GA-SC	Galveston-Texas City, TX	Odessa, TX
6.	Baton Rouge, LA	Abilene, TX	Lafayette, LA	Mobile, AL
7.	Wichita, KS	Nashville, TN	Baton Rouge, LA	Rockford, IL
8.	Houston-Brazoria, TX	Fayetteville, AR	Houston-Brazoria, TX	Davenport, IA
9.	Lima, OH	McAllen-Edinburg, TX	Odessa, TX	Jackson, MI
10.	Odessa, TX	Galveston-Texas City, TX	Anchorage, AK	Beaumont-Port Arthur,TX

Notes: Entries are the sample cities (MSAs) with the largest and smallest predicted growth in TFP from 1980 to 1990 for each of the instrumental variables: the baseline share-shift instrument (Column 1), the intensity of patenting activity instrument (Column 2), the export exposure instrument (Column 3), and stock market return instrument (Column 4).

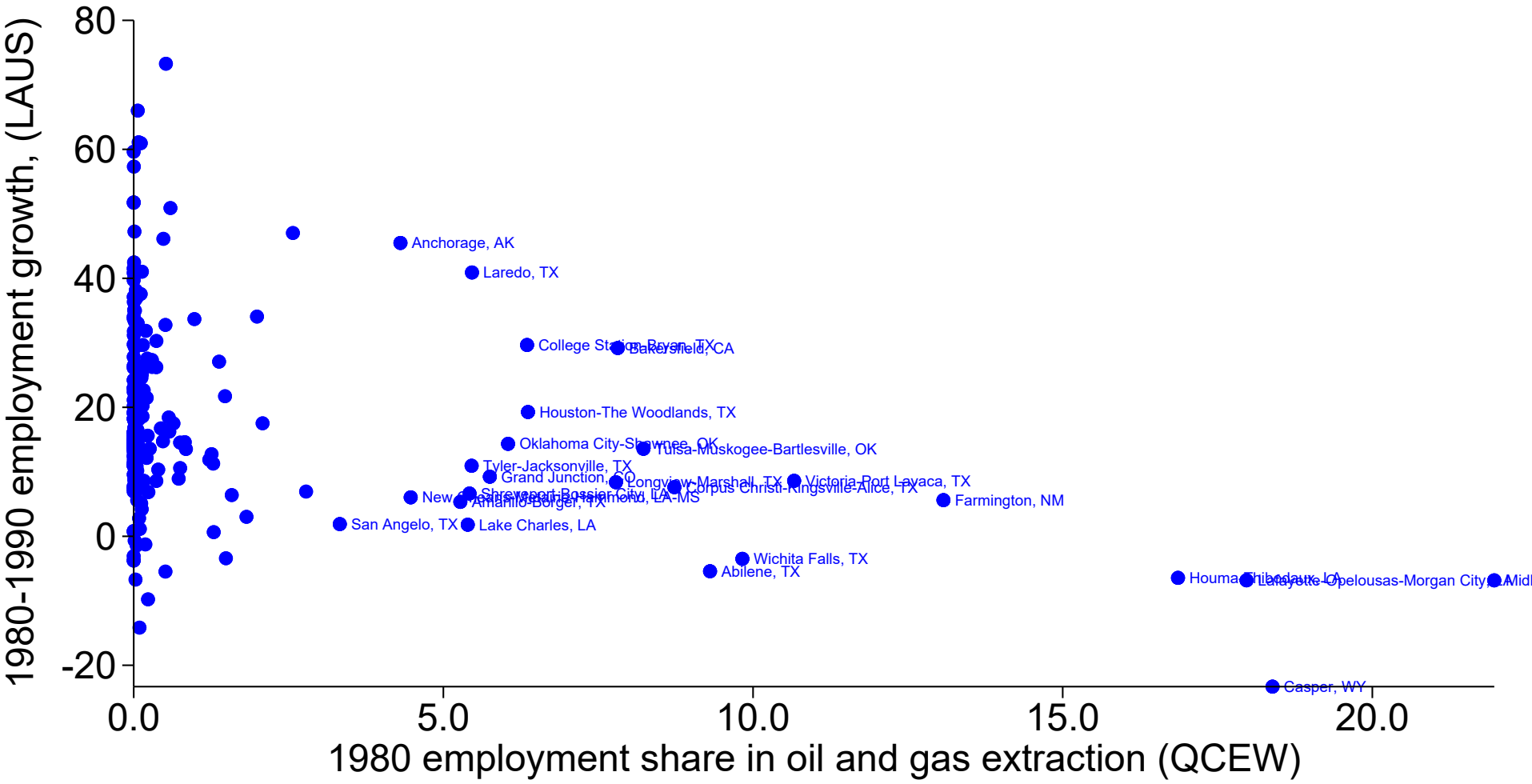
- Cities with worst predicted TFP dominated by O&G belt.
- Pattern true for each instrument.
- Reflects negative TFP in Oil and Gas Field Machinery and Equipment and concentrated production.

City performance



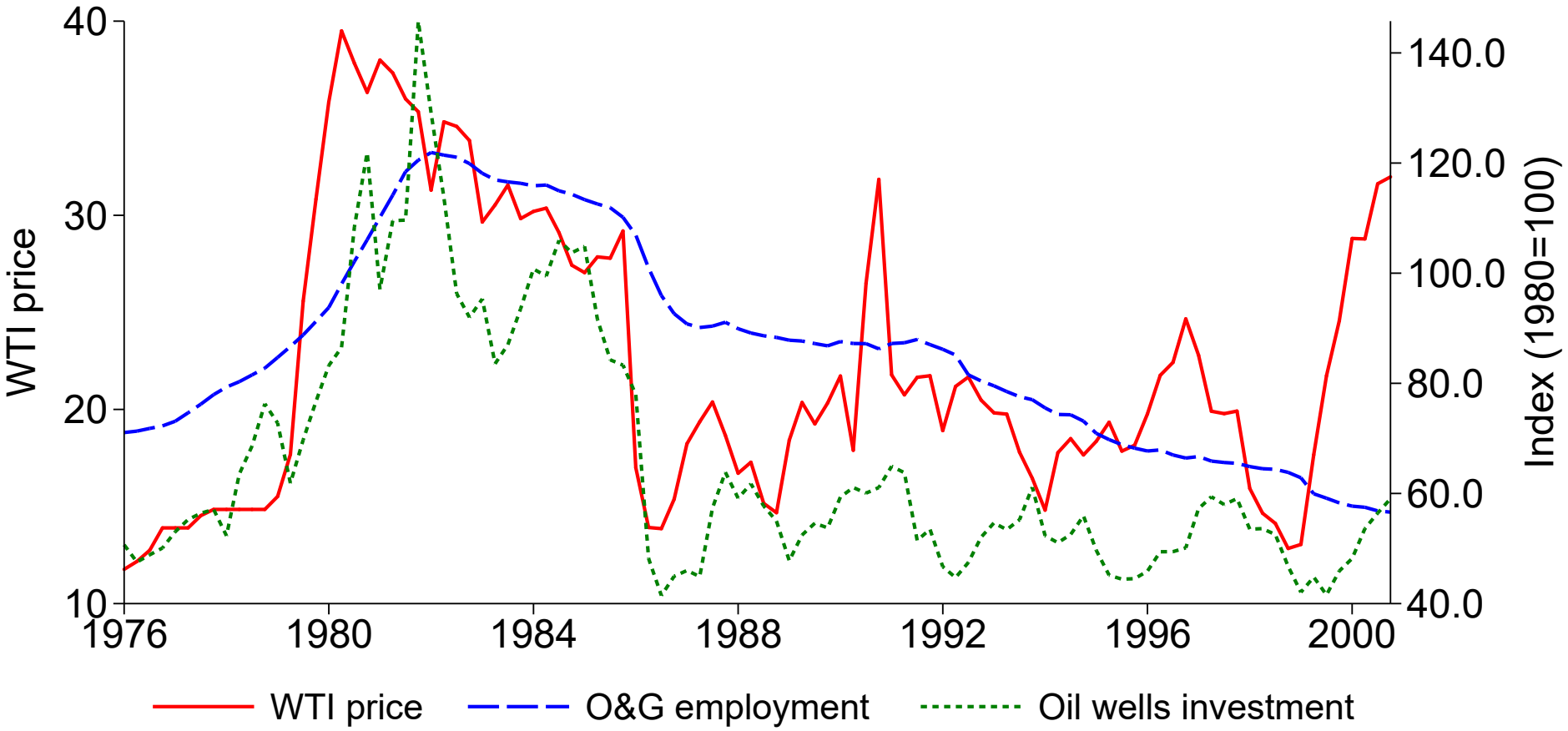
- O&G cities busted during 1980s.

City performance



- Regress $\ln(\text{emp}_{i,1990}/\text{emp}_{i,1980}) = \beta_0 + \beta_1[\text{O\&G emp. share}]_{i,1980} + e_i$: $\beta_1 = -1.39$, robust s.e.=0.21, $R^2 = 0.09$, $N = 207$.

Oil and gas sector



- Oil&gas sector (not in manufacturing) hammered during 1980s due to oil price decline.

Solutions

1. Compute Rotemberg weights (Goldsmith-Pinkham, Smith, Sorkin, WP) to formally assess importance of different areas/industries.
2. Do robustness dropping these areas or industries (see e.g. Chodorow-Reich and Wieland, forthcoming).
3. Clarify what in paper depends on TFP interpretation (industry spillovers yes, direct versus indirect effects maybe not).
4. Allow standard errors to be correlated across areas with similar Bartik exposure (Adão,Kolesár,Morales, WP).

Comment: do we need GE models?

- Key idea in paper: some indirect effects intermediated solely through slopes of labor demand and housing supply curves.
- Similar to sufficient statistics approach.
- Only captures wage and rent spillovers... but GE model only captures what you put into it.
- Misses higher order indirect effects, e.g. workers leave city B for city A, but then other workers migrate into city B from city C...
- Models help in guiding empirics:
  - Does I-O structure of production matter to shock measurement?
  - Can we aggregate from compliers?

Comment: framing

- Largest TFP growth in IT producing industries.
- Paper evaluates welfare change on workers engaged in production of IT (and their substitutes).
- Other effects:
  - Consumer surplus: consumer prices of IT goods fall.
  - Capital deepening: investment prices fall.
- Other effects inherently aggregate, omitted in regional data.

Smaller comments

- Would be nice to relate to business cycle frequency analysis of labor mobility (Farhi and Werning, WP, "Labor Mobility within Currency Unions") and local multipliers (Chodorow-Reich, 2019, "Geographic Cross-Sectional Fiscal Spending Multipliers").

- Effects on inequality rely on TFP being skill-neutral. Assumed in measurement but maybe not true in reality.

Appendix slides