

The Hydrocarbon Hat Trick



How Eagle Ford is impacting Texas

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May 2014

The Hydrocarbon Hat Trick

Extraction



Refining



Petrochemicals





Austin

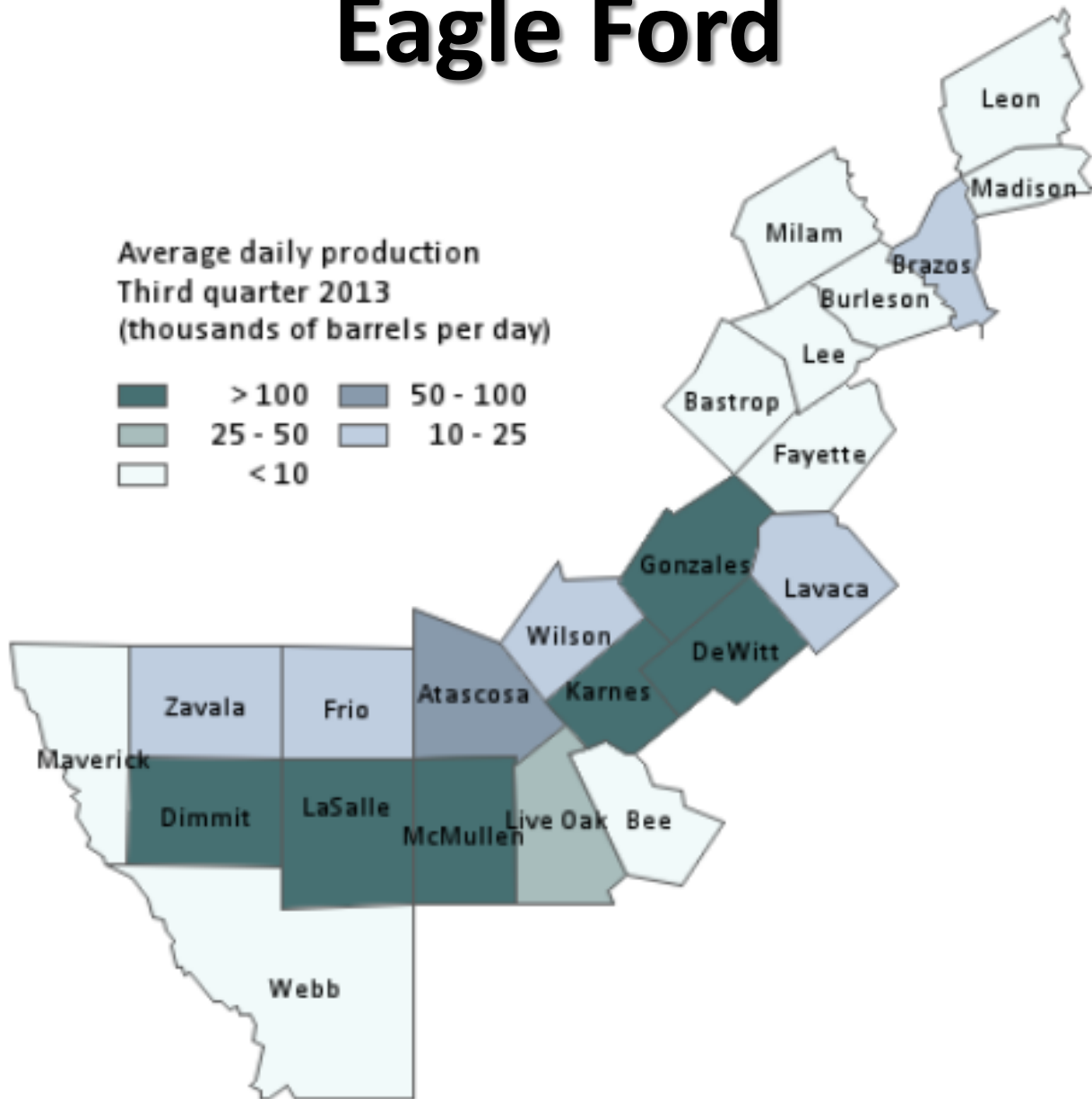
San Antonio

Eagle Ford Shale

Eagle Ford

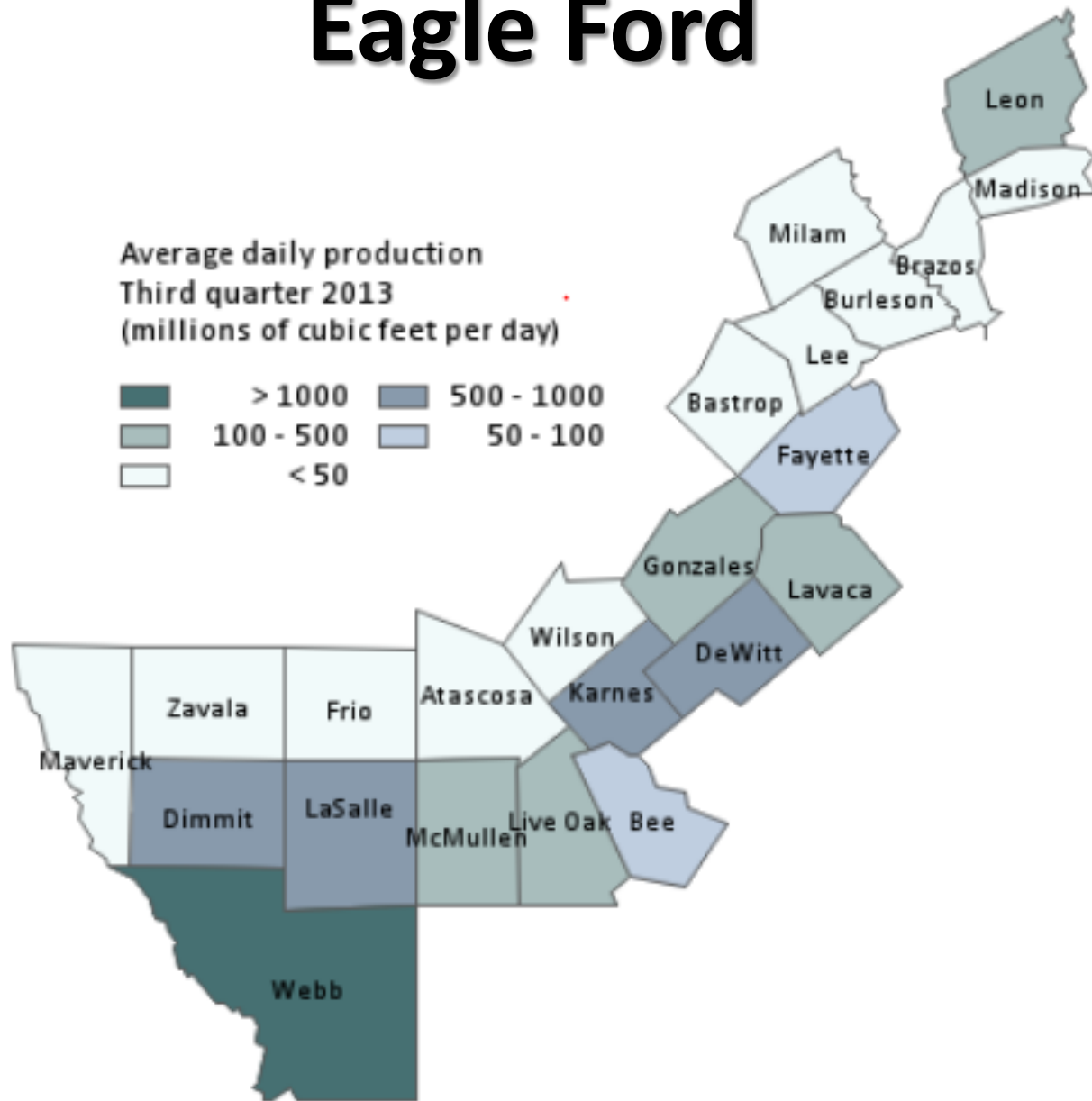


Eagle Ford



SOURCES: Energy Information Administration; Railroad Commission of Texas; calculations by Federal Reserve Bank of Dallas.

Eagle Ford



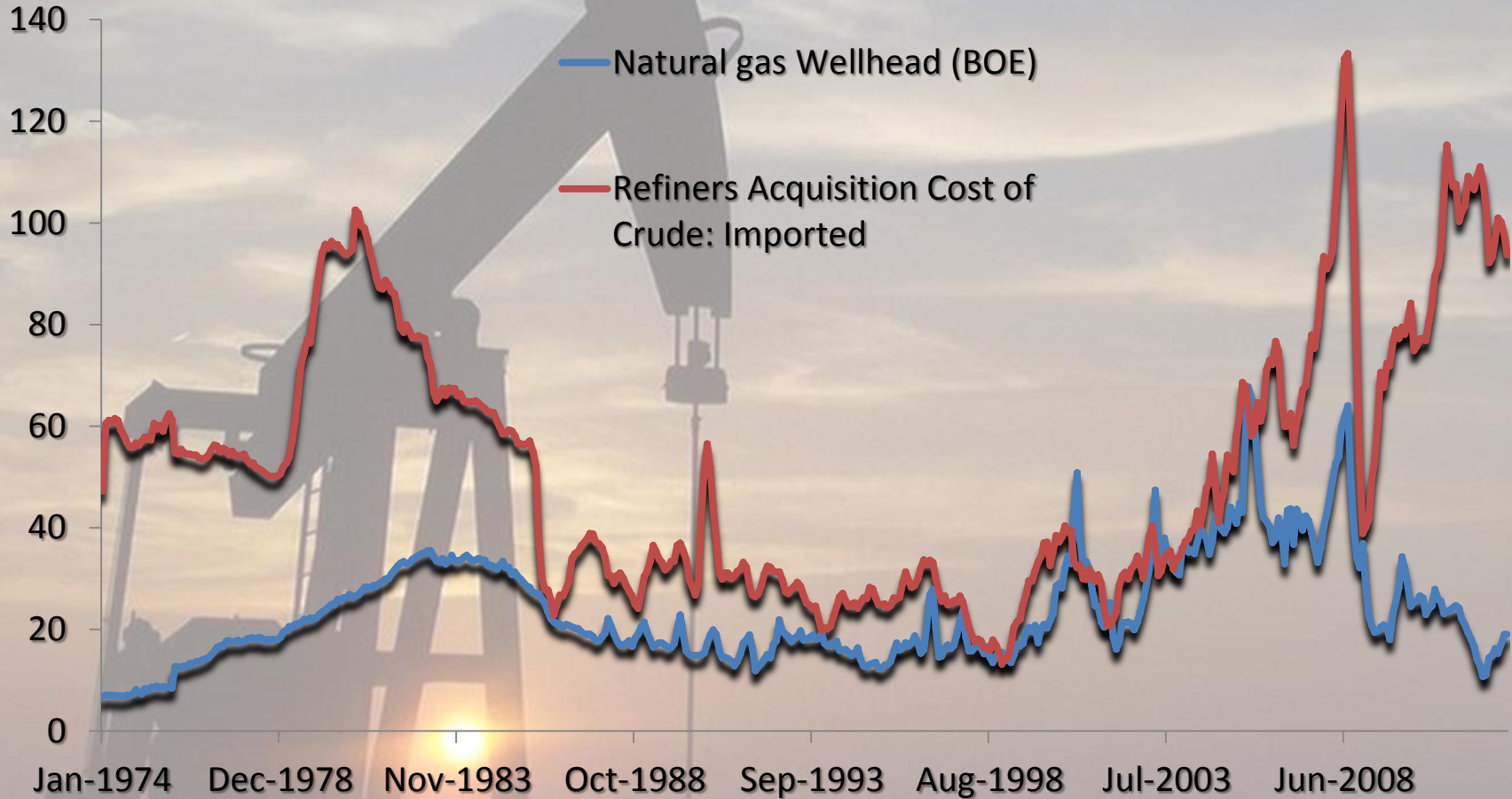
SOURCES: Energy Information Administration; Railroad Commission of Texas; calculations by Federal Reserve Bank of Dallas.

Oil & Gas Extraction



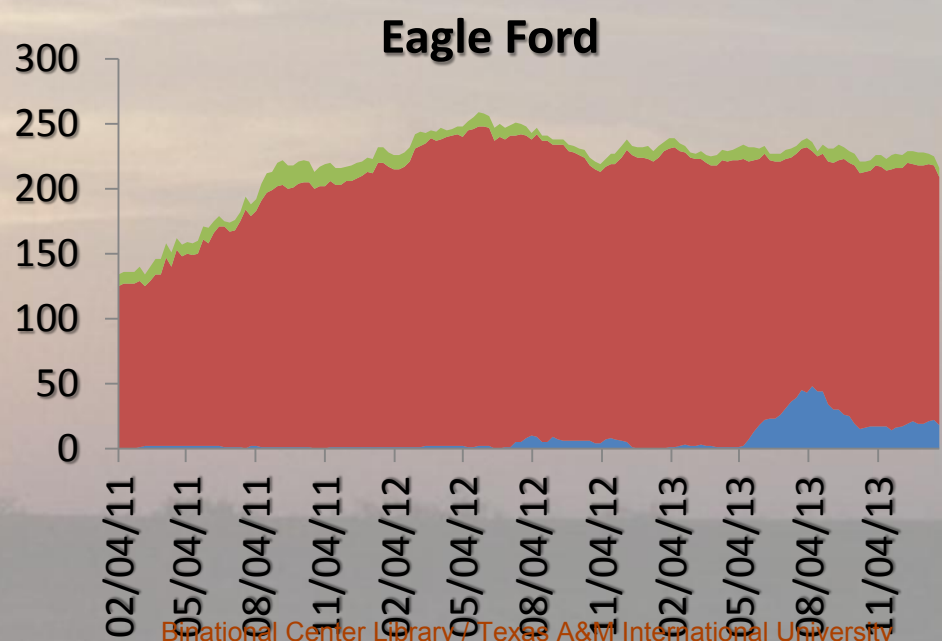
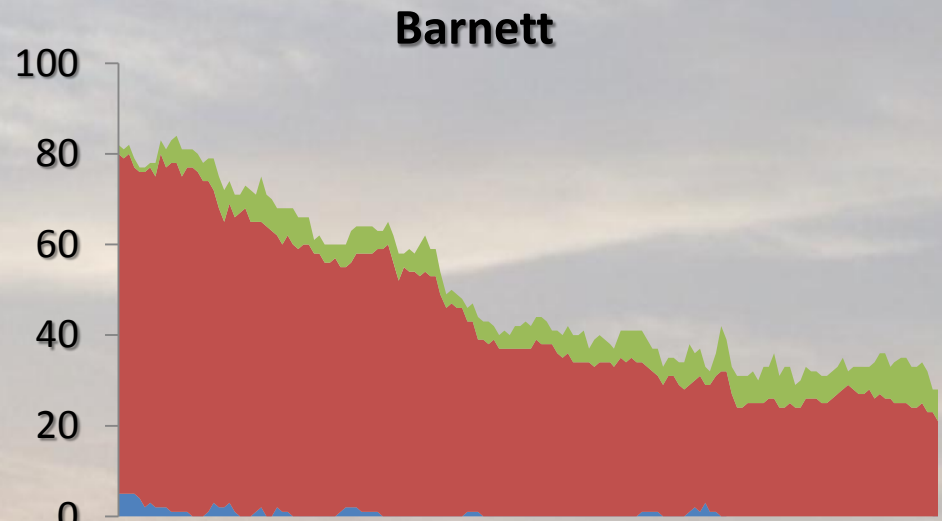
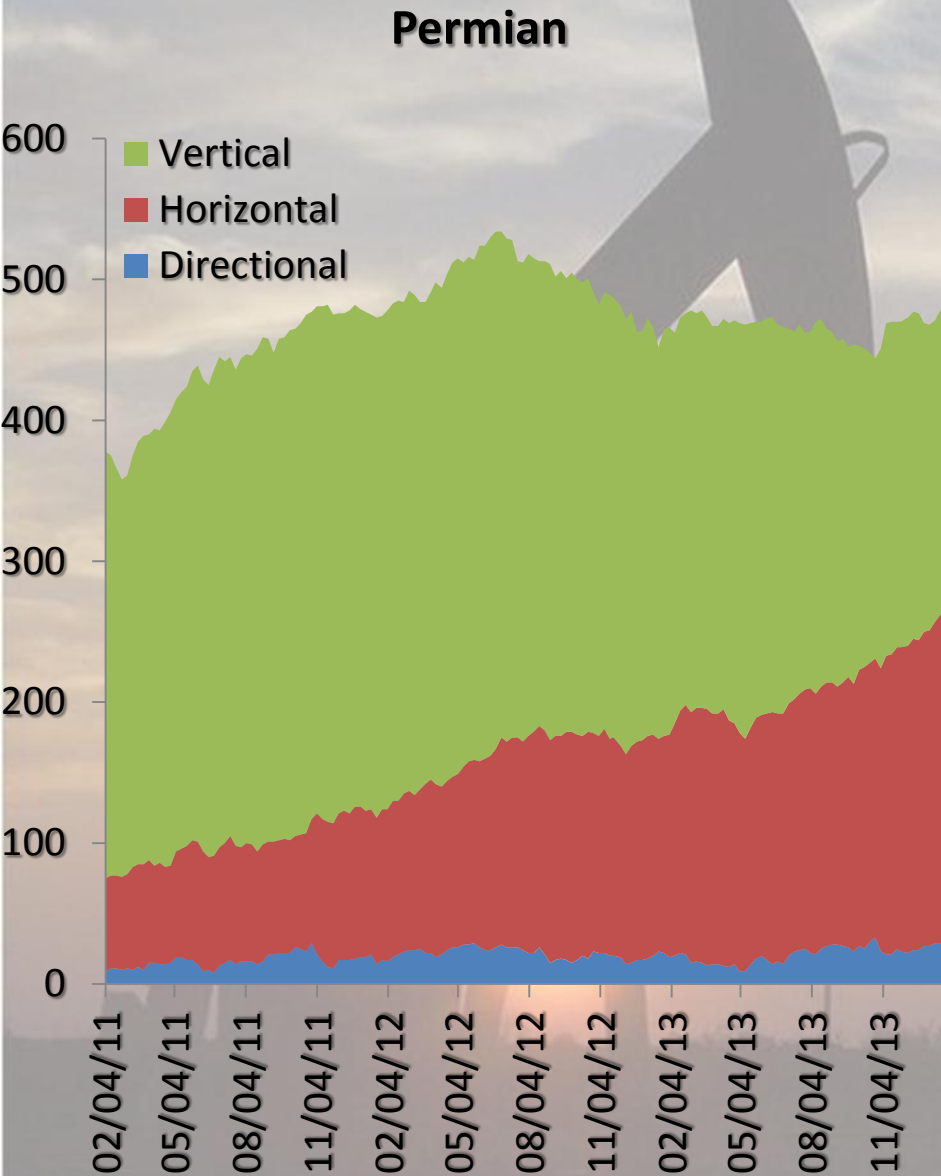
Oil & Gas Extraction

Oil and gas prices diverge

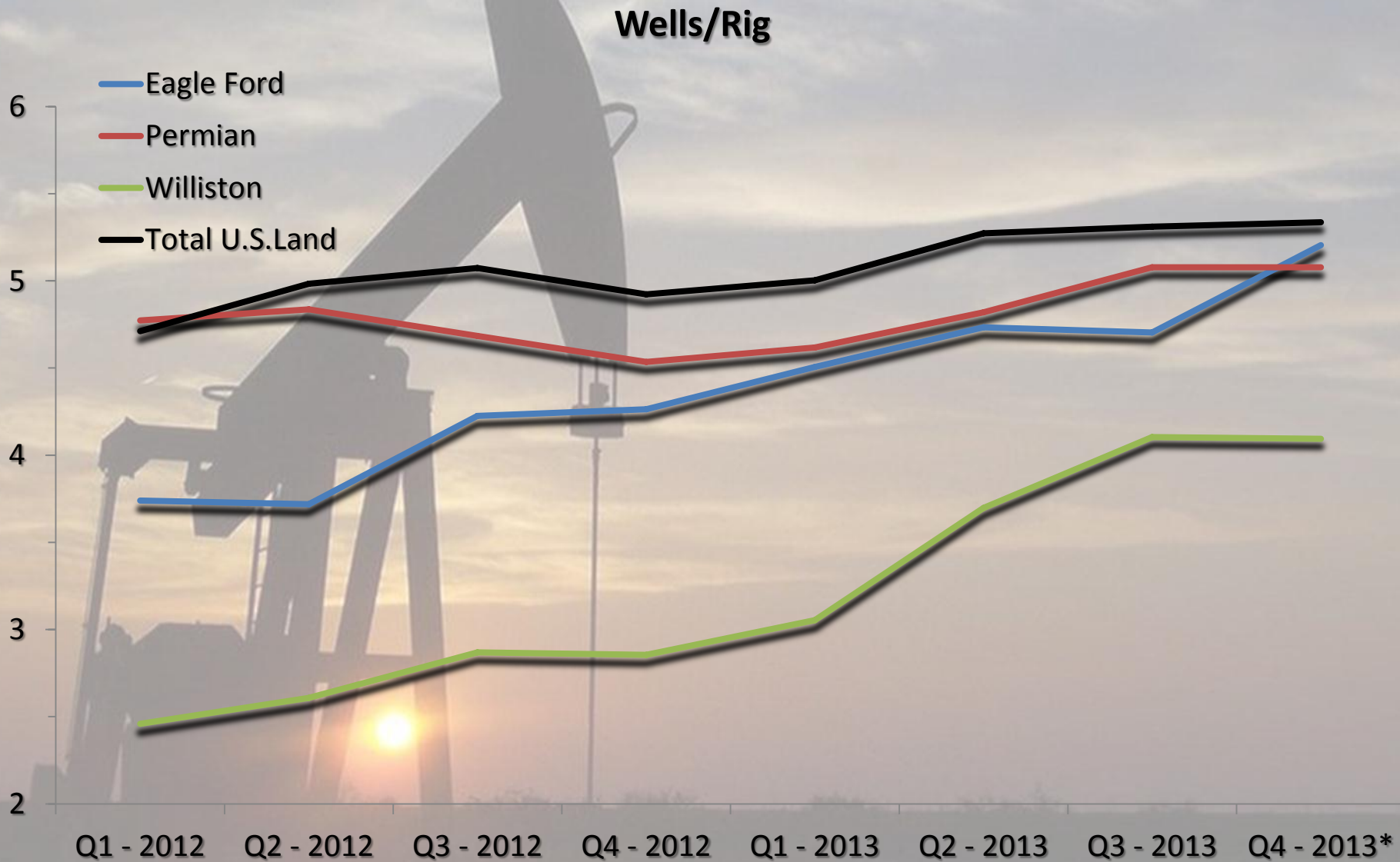


* Adjusted using consumer price index: all urban consumers.
SOURCE: Energy Information Administration. Author's adjustments.

Basins on Different Trends



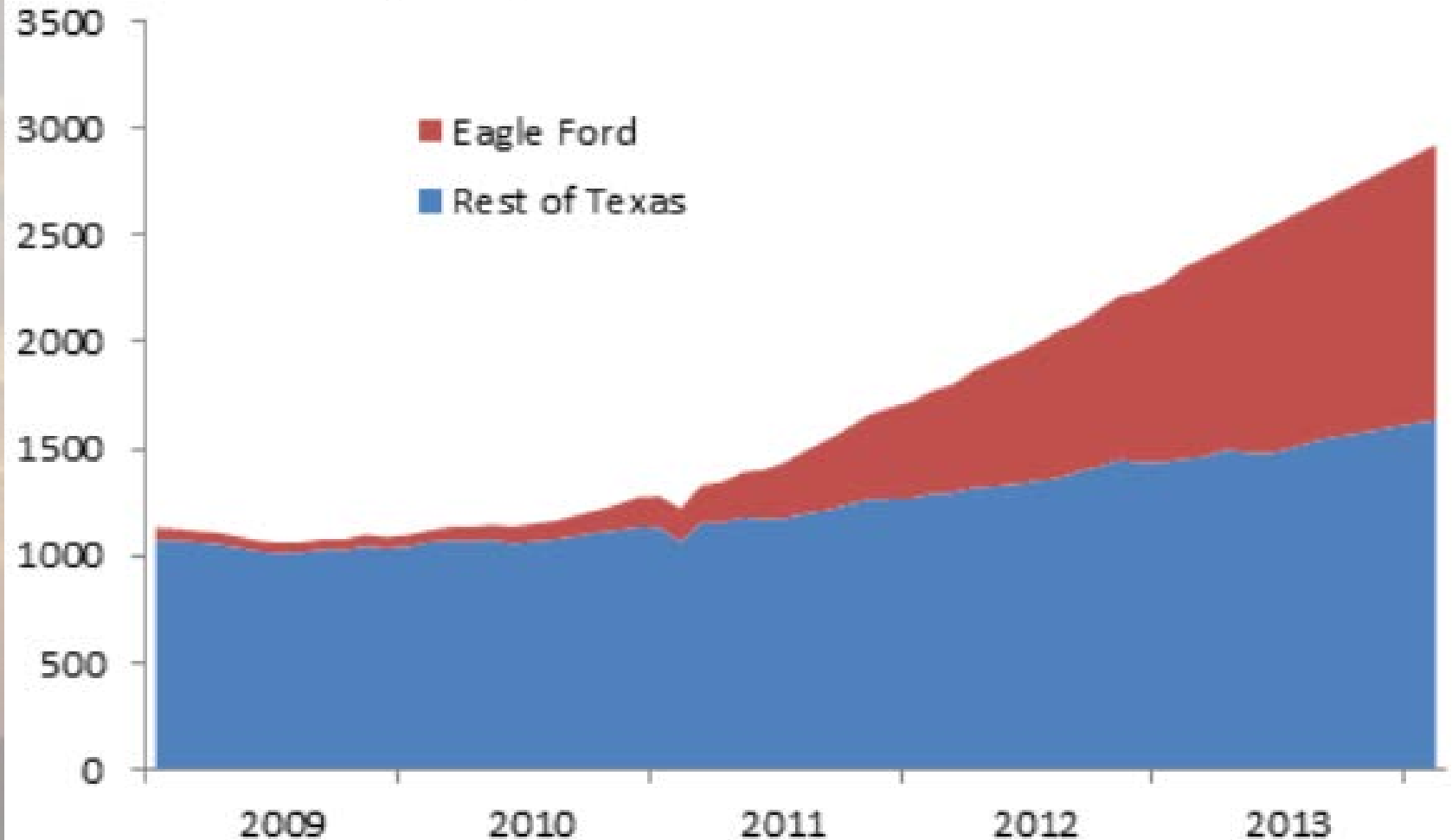
Oil & Gas Extraction



Oil & Gas Extraction

Monthly Oil Production in Eagle Ford and Rest of Texas

Thousands of barrels per day

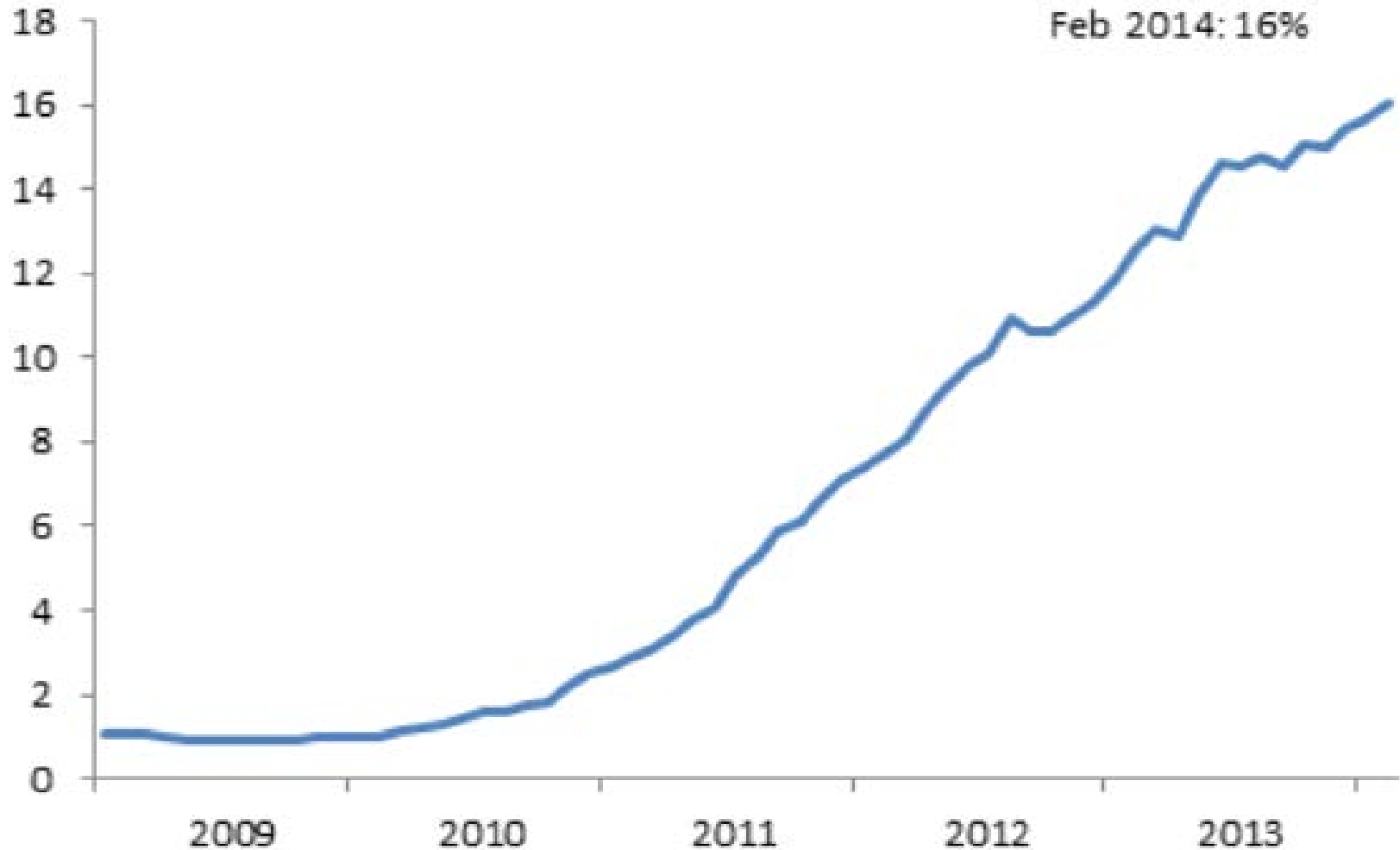


SOURCES: Energy Information Administration.

Oil & Gas Extraction

Share of U.S. Oil Produced in Eagle Ford

Percent, monthly



SOURCES: Energy Information Administration; calculations by Federal Reserve Bank of Dallas

Oil & Gas Extraction

Share of U.S. Natural Gas Produced in Eagle Ford

Percent, monthly

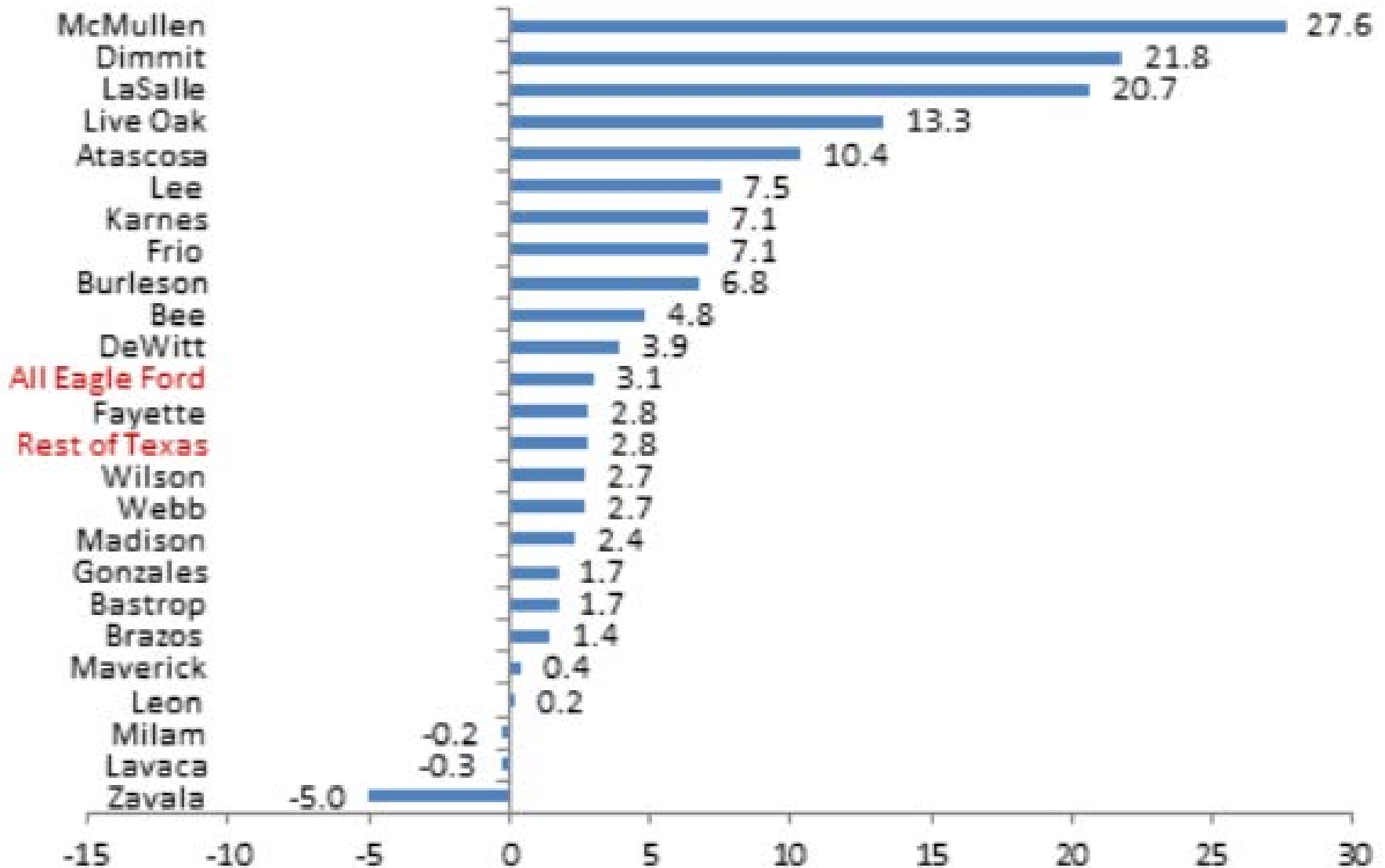


SOURCES: Energy Information Administration; calculations by Federal Reserve Bank of Dallas

Annualized Percent Change in Employment

Across Eagle Ford Counties

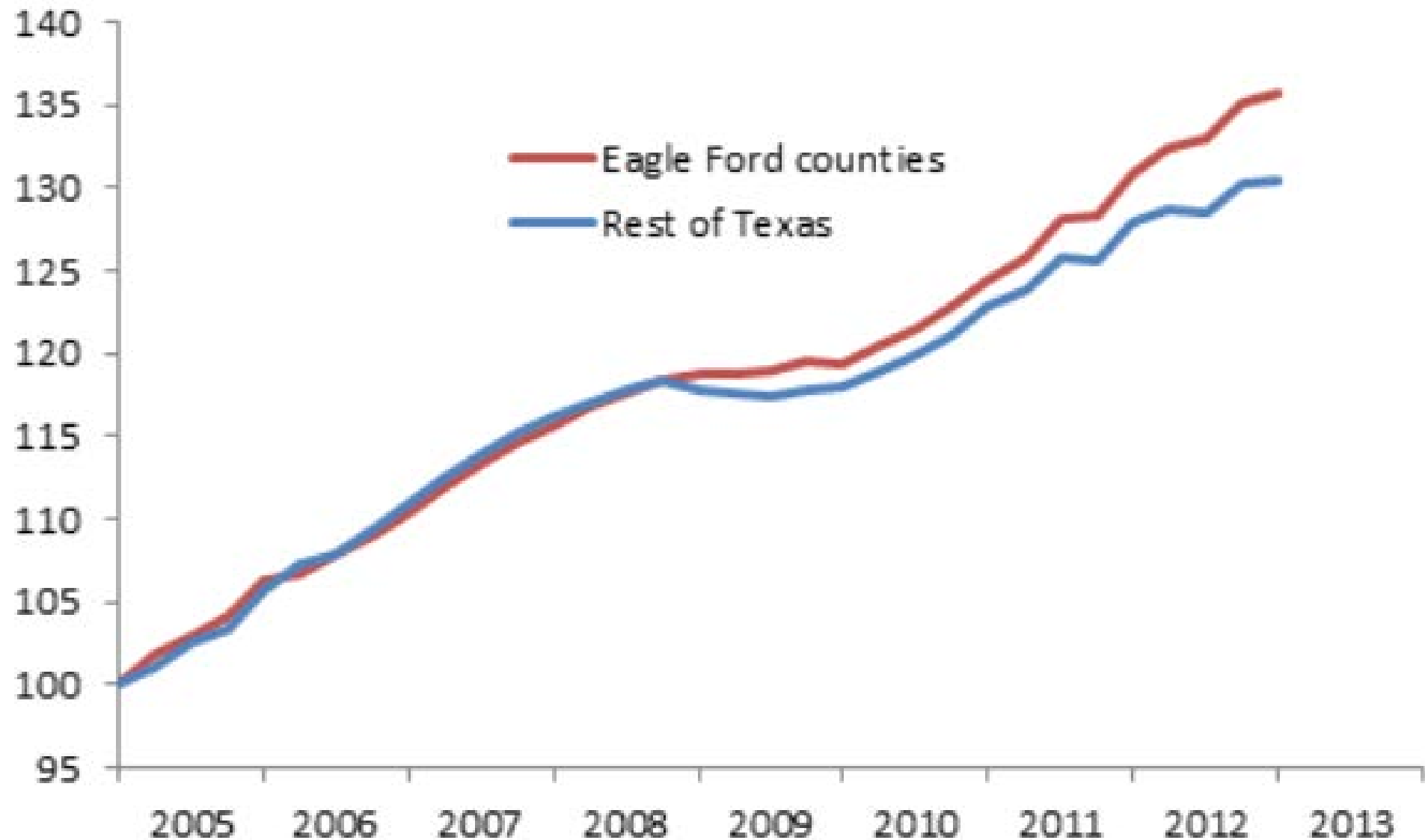
First quarter 2010 to third quarter 2013



SOURCES: Texas Workforce Commission; Federal Reserve Bank of Dallas.

Average Weekly Wages in Eagle Ford and Rest of Texas

Index, 2005: Q1 = 100*

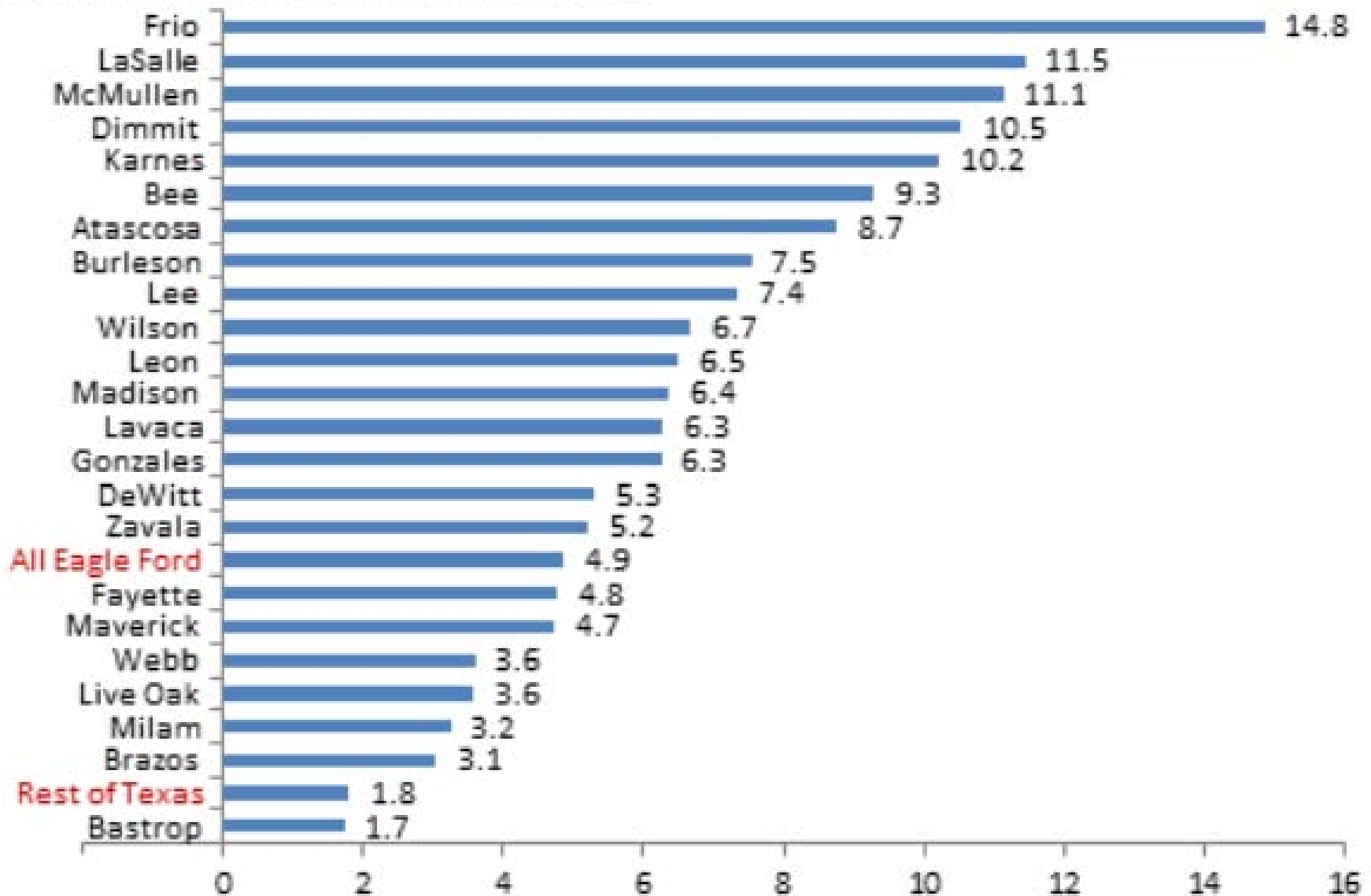


*4-quarter moving average.

SOURCES: Texas Workforce Commission; Federal Reserve Bank of Dallas.

Annualized Percent Increase in Average Weekly Wages Across Eagle Ford Counties

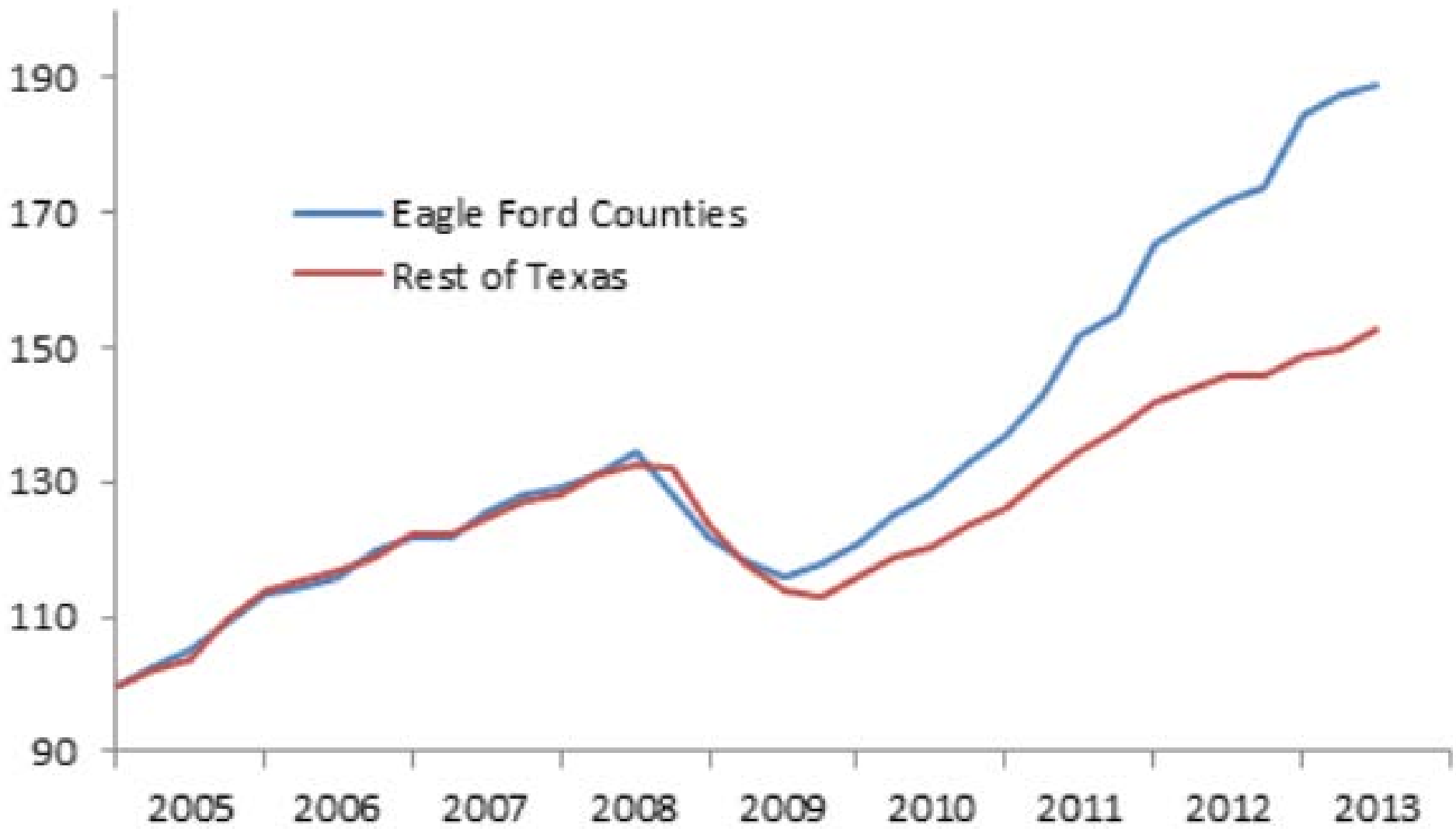
First quarter 2010 to third quarter 2013



SOURCES: Texas Workforce Commission; Federal Reserve Bank of Dallas.

Taxable Sales in Eagle Ford Counties and Rest of Texas

Index, 2005:Q1 = 100*

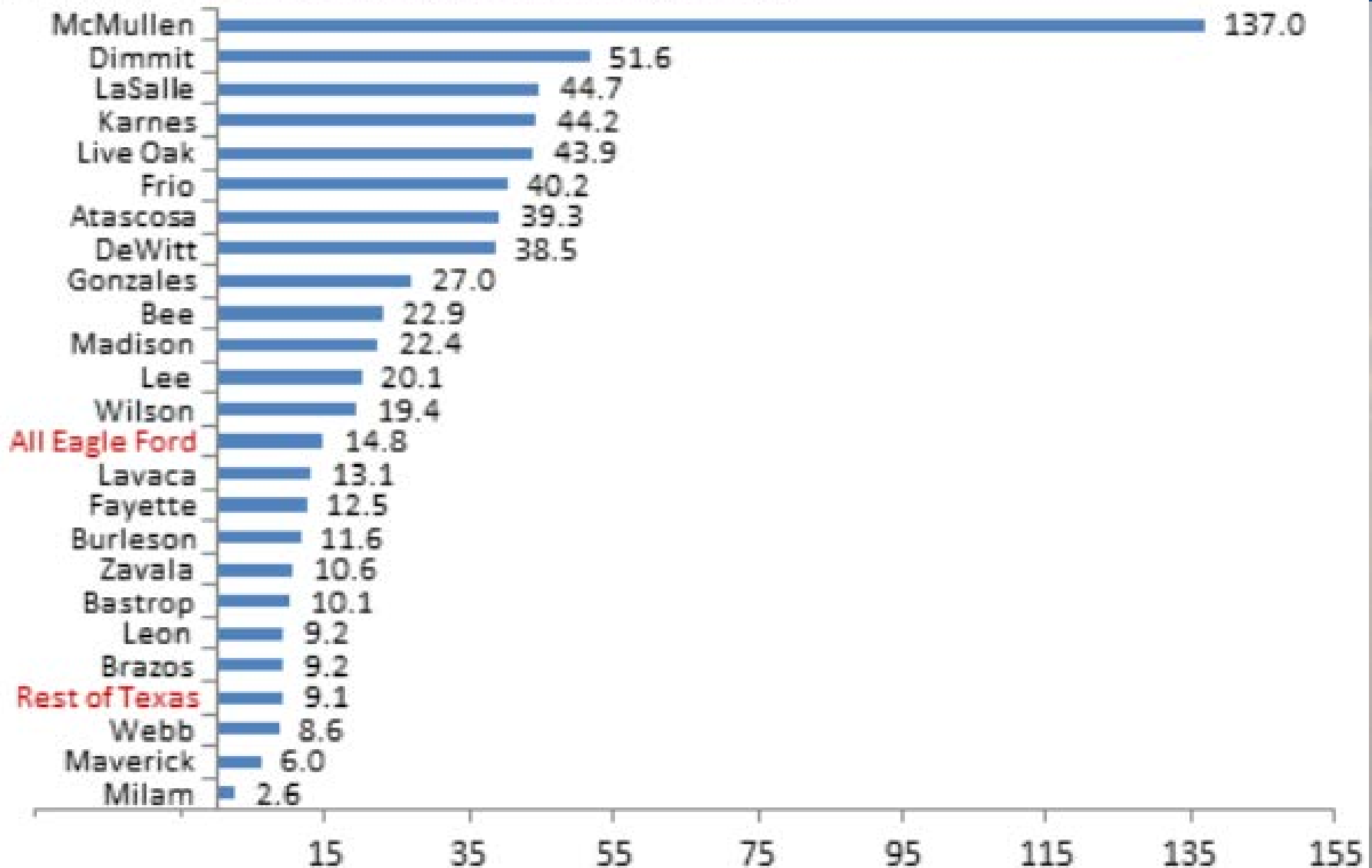


*Seasonally adjusted.

SOURCES: Texas Comptroller of Public Accounts; Federal Reserve Bank of Dallas.

Annualized Percent Increase in Taxable Sales Across Eagle Ford Counties

First quarter 2010 to third quarter 2013 (percent)



SOURCES: Texas Comptroller of Public Accounts; Federal Reserve Bank of Dallas.

Severance Taxes Rise

\$4.5 billion in revenues in 2013

- Oil severance taxes \$3 billion

- Natural Gas severance taxes \$1.5 billion

10.7% of total state tax revenues

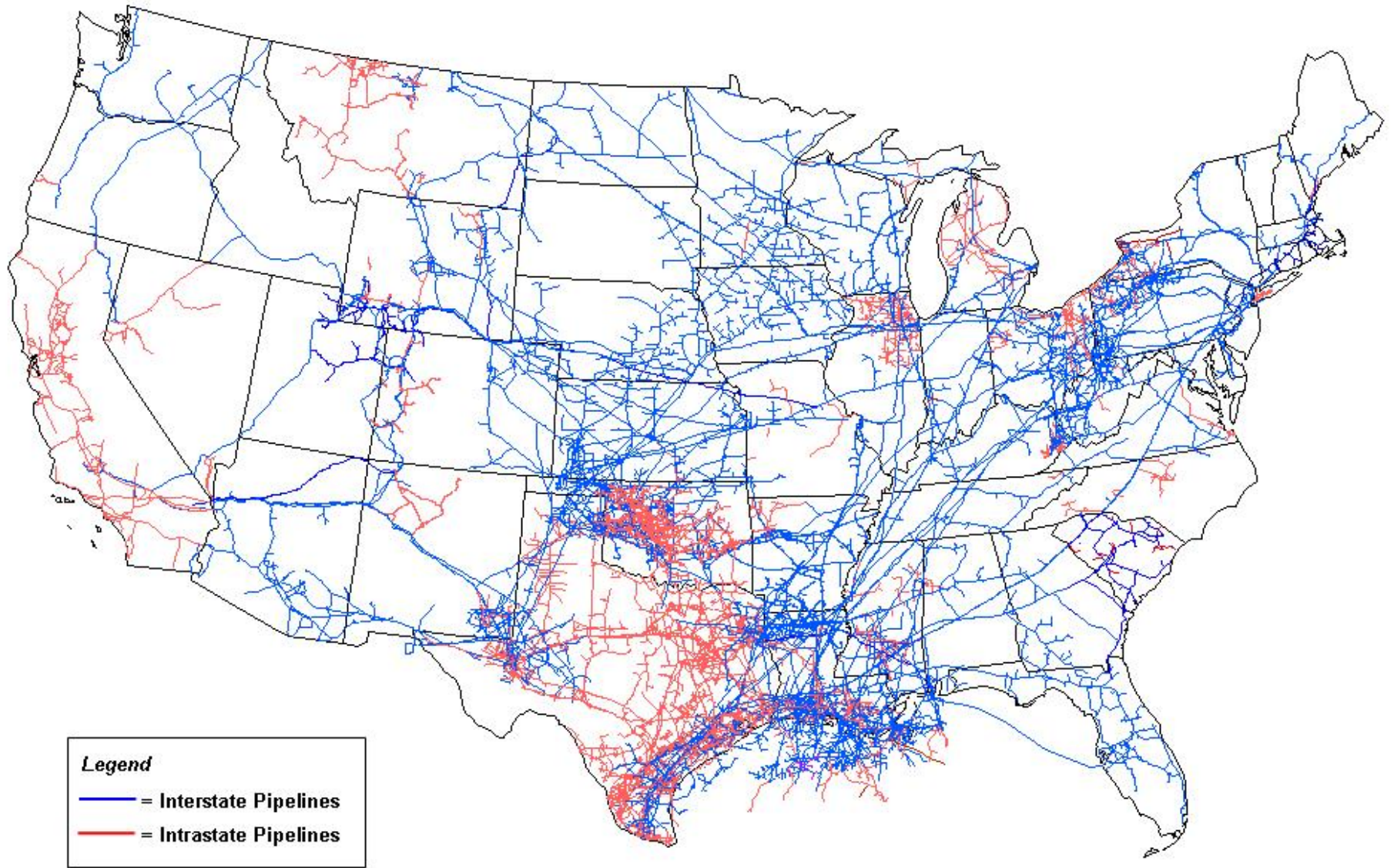
45% increase from 2012

Lower 48 states shale plays



Source: Energy Information Administration based on data from various published studies.
 Updated: May 9, 2011





Source: Energy Information Administration, Office of Oil & Gas, Natural Gas Division, Gas Transportation Information System

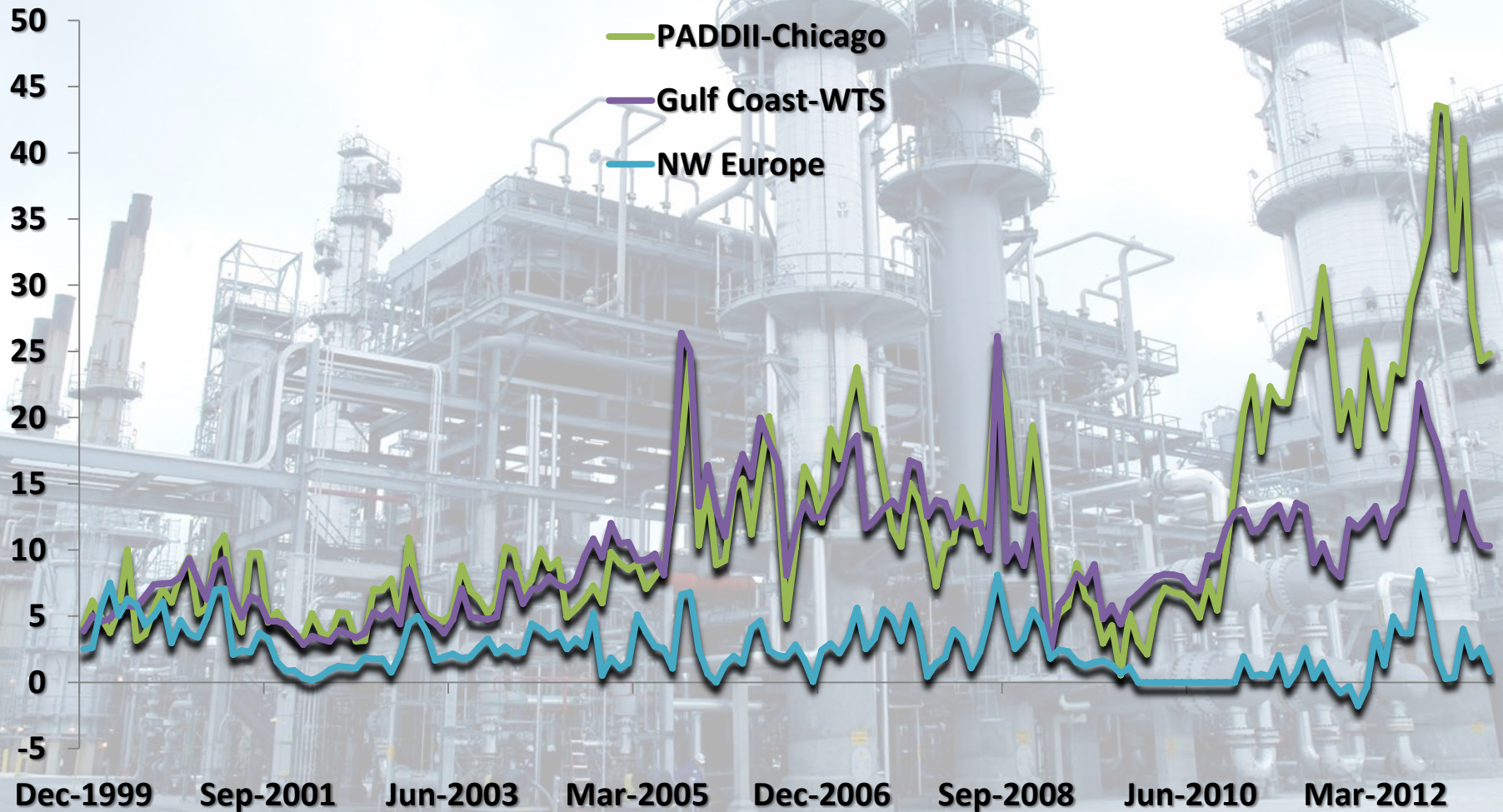
Refining & Petrochemicals



Refining & Petrochemicals

Refiner margins up on cheaper inputs

Dollars per bbl



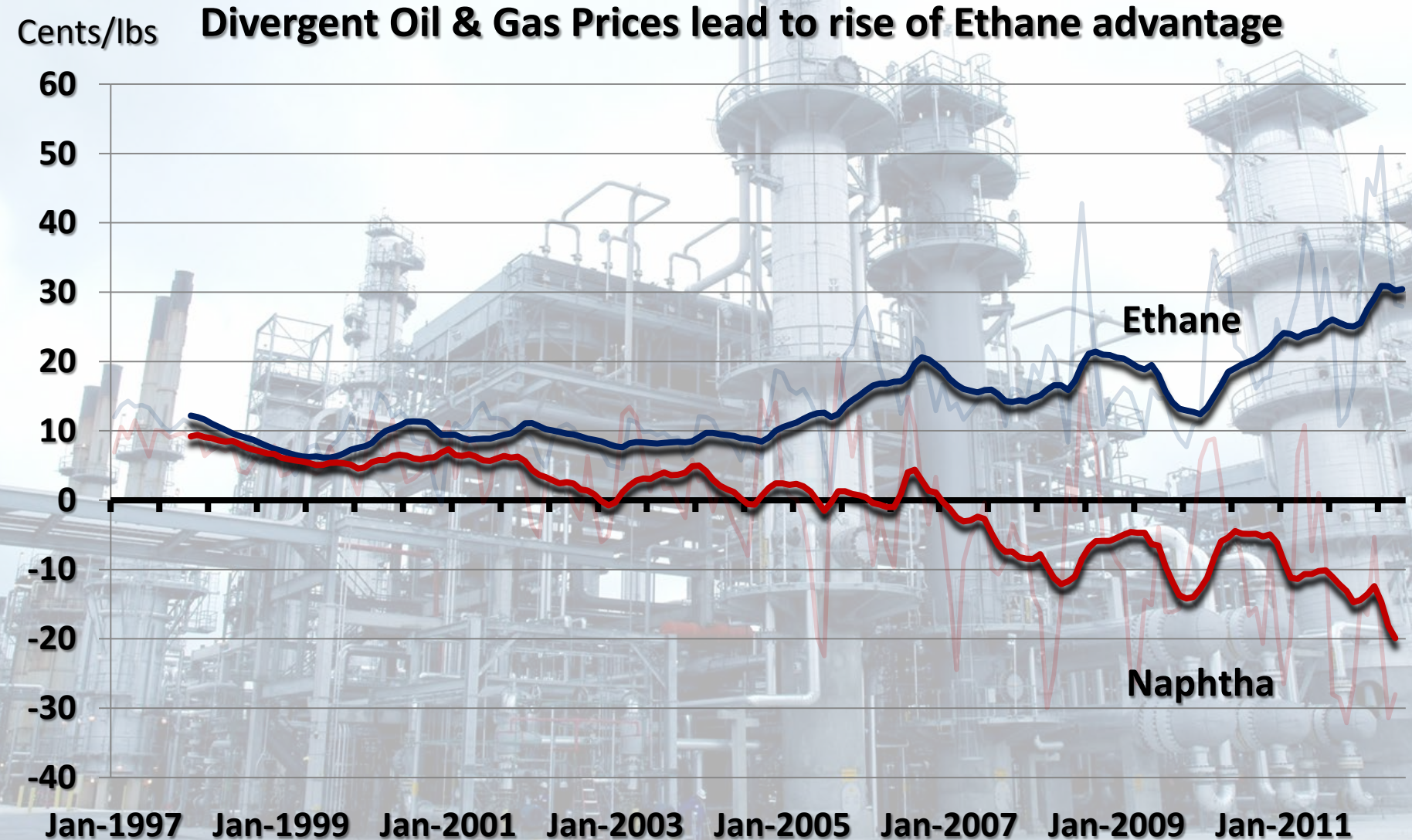
Finished Petroleum Product Exports

U.S. becomes net exporter of finished petroleum products

Mil. BBL, DOE

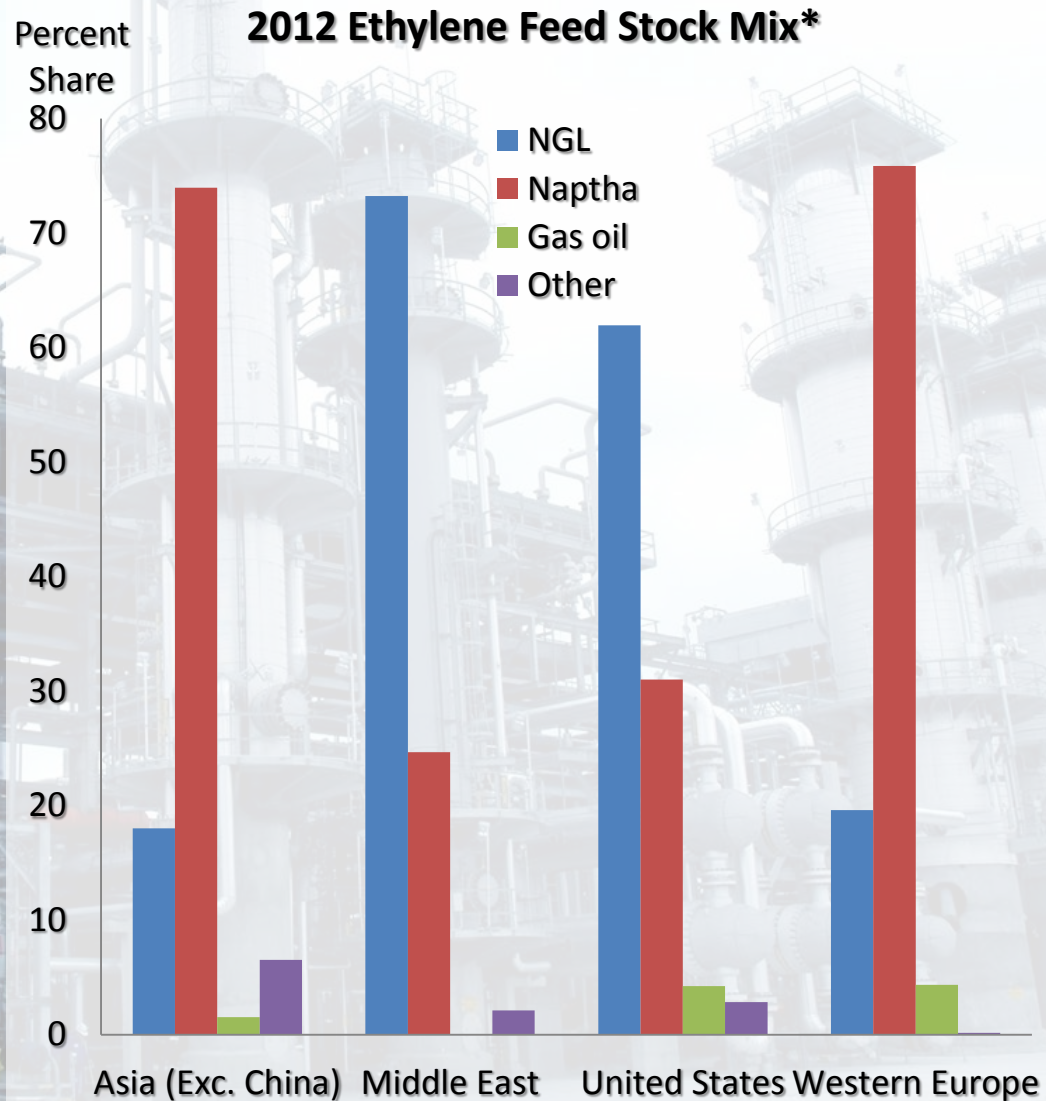


Refining & Petrochemicals



Advantage U.S. Ethylene

2012 Nameplate capacity	
	Tons/year
Asia (Exc. China)	24,906,000
China	13,778,000
Middle East	25,509,000
United States	28,121,132
Western Europe	24,384,000
Rest of World	26,704,294
Total	143,402,426.00

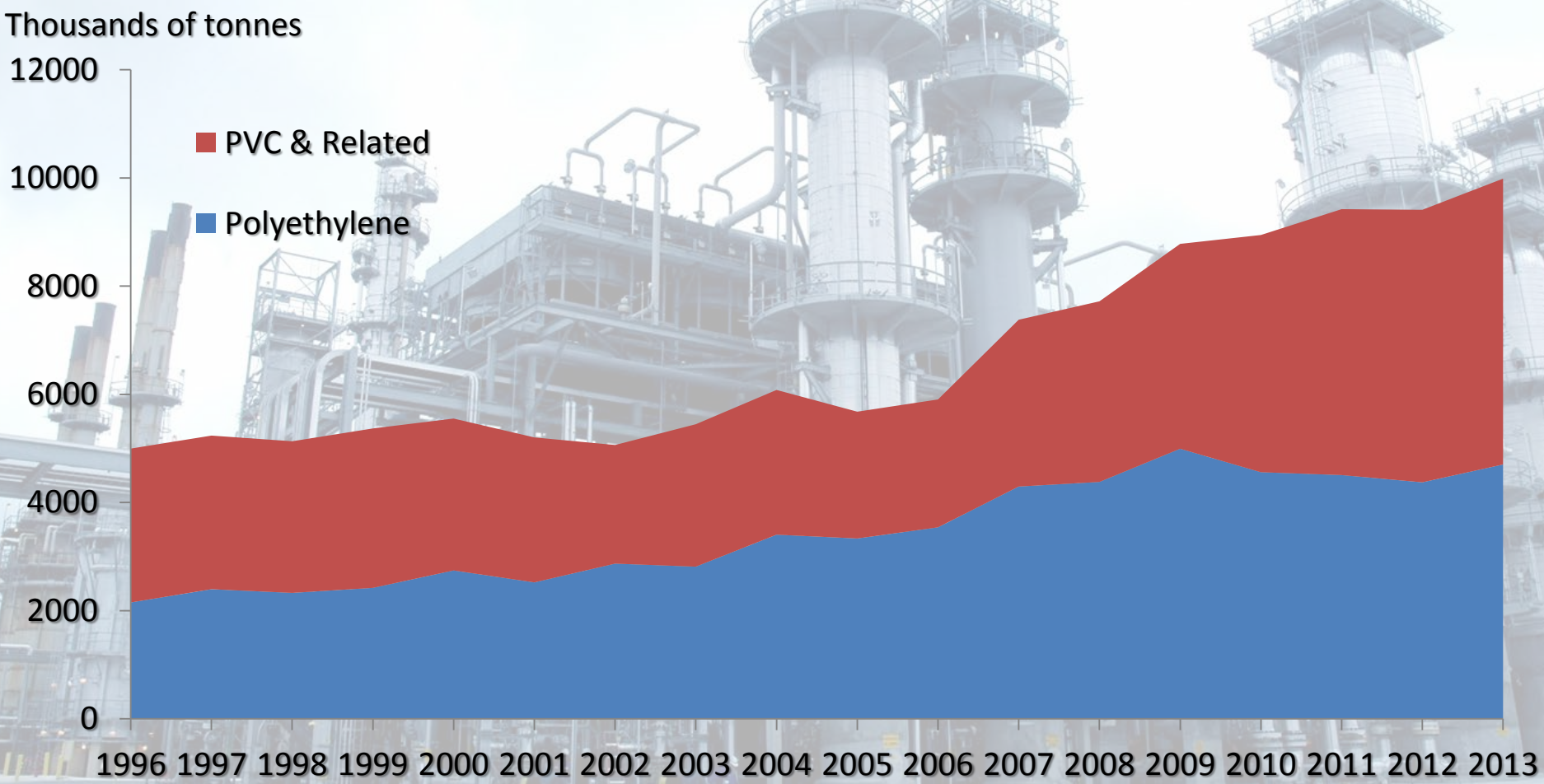


SOURCE: Oil & Gas Journal International Survey of Steam Crackers

Note: The percent of nameplate capacity that reported feedstock mix varies

Ethylene Chemistry In Exports

Exports grow, then flatten out



New Capacity by 2020

New Plants, Expansions, “De-bottlenecks”,
Hundreds of Billions of Dollars in Capital
Investment.

- Ethylene: up 52%
- Polyethylene up 47%
- Methanol: 12.7m Tonnes
- On-Purpose Propylene plants

Assuming it all gets built:

- costs are creeping
- permits are slow

Outlook



Outlook



Outlook

- **Labor and Environment: Regulatory Uncertainty**
- **Water and infrastructure?**
- **Labor Force!**
- **The Global Economy is Slowing?**

Outlook is Positive

The Hydrocarbon Hat Trick

The background of the slide is a photograph showing the silhouettes of two people riding horses. They are positioned in the center-right of the frame, facing left. The sky is a vibrant gradient of orange and red, indicating a sunset or sunrise. The silhouettes of trees and a horizon line are visible in the lower portion of the image.

How shale is impacting the energy industry

Jesse Thompson

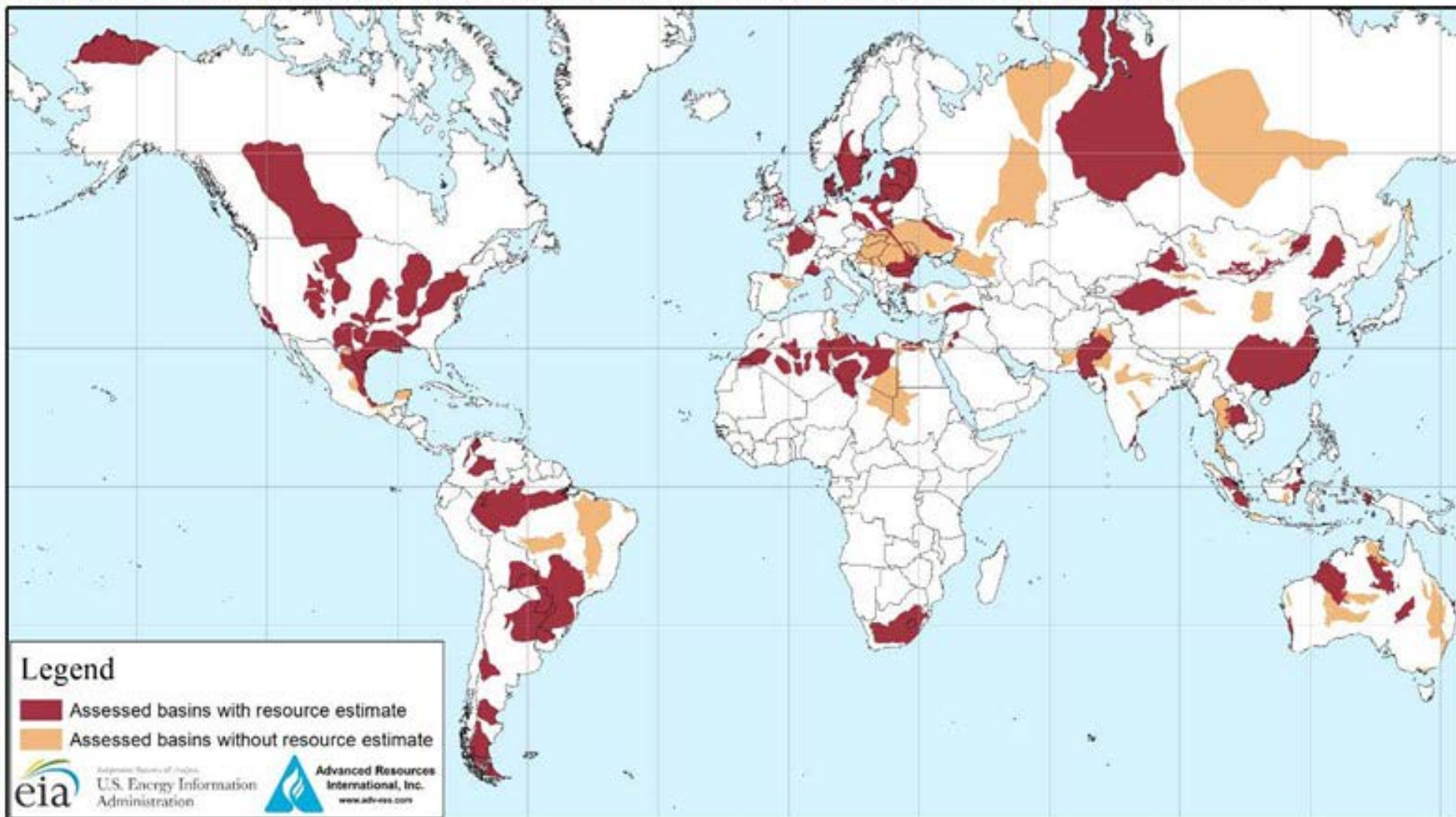
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The Federal Reserve Bank of Dallas, Houston Branch

April 2014

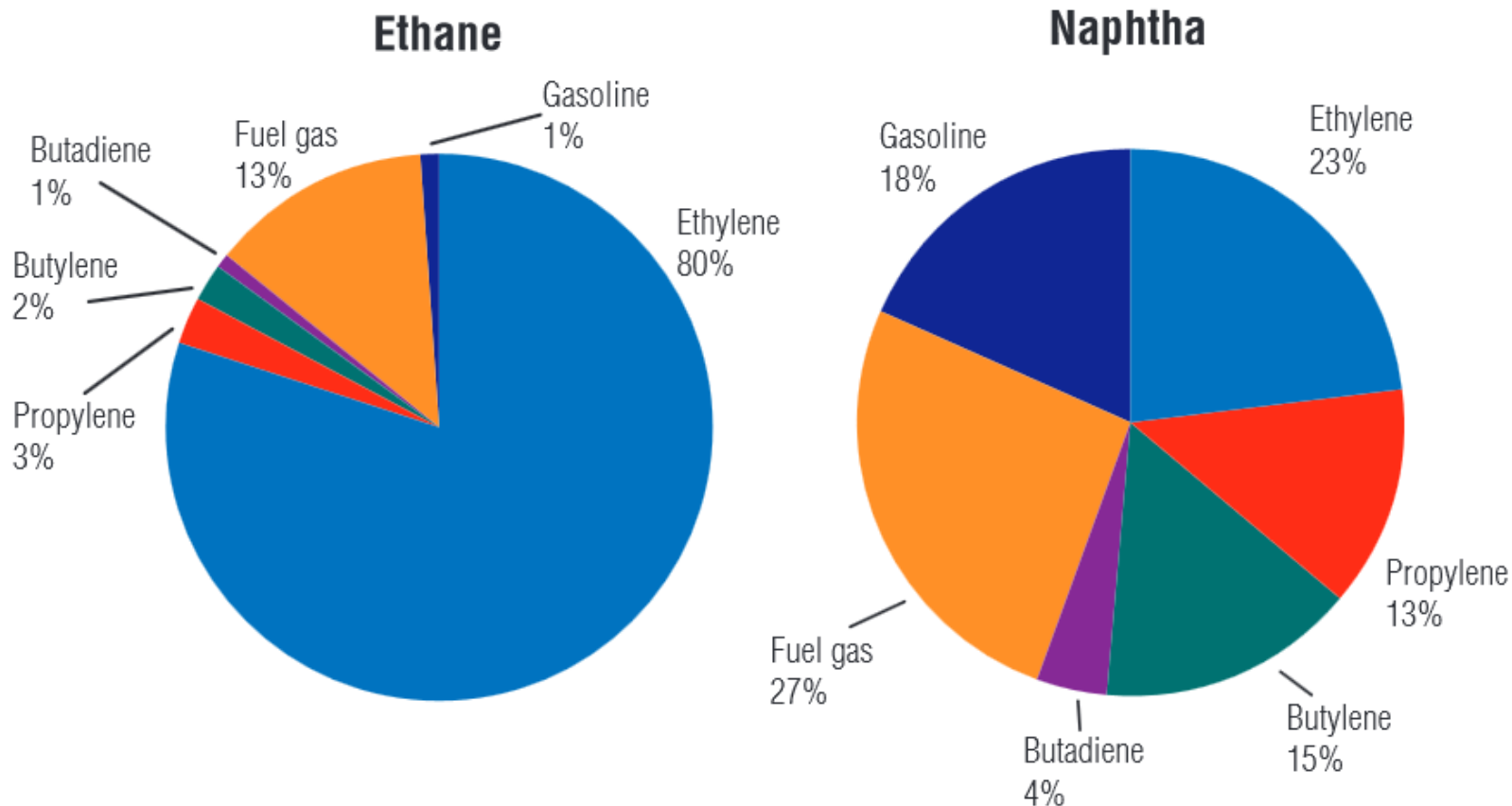
Everyone has shale

Figure 1. Map of basins with assessed shale oil and shale gas formations, as of May 2013



Source: United States basins from U.S. Energy Information Administration and United States Geological Survey; other basins from ARI based on data from various published studies

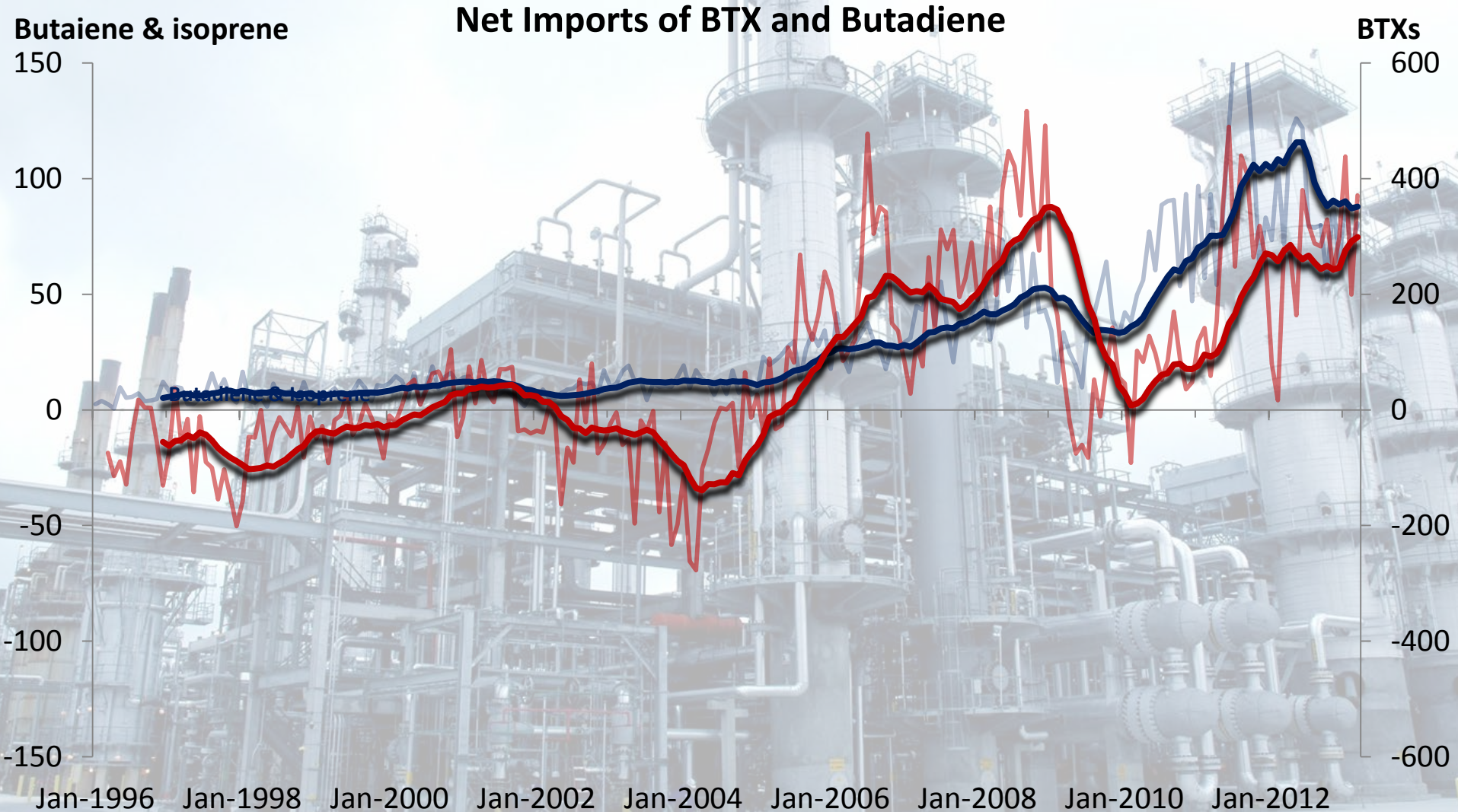
Ethylene only part of the story...



NOTE: BTX is included in gasoline totals.

SOURCE: *Petrochemicals in Nontechnical Language*, by Donald L. Burdick and William L. Leffler, Tulsa, Okla.: PennWell Publishing, 2010.

Ethylene only part of the story...



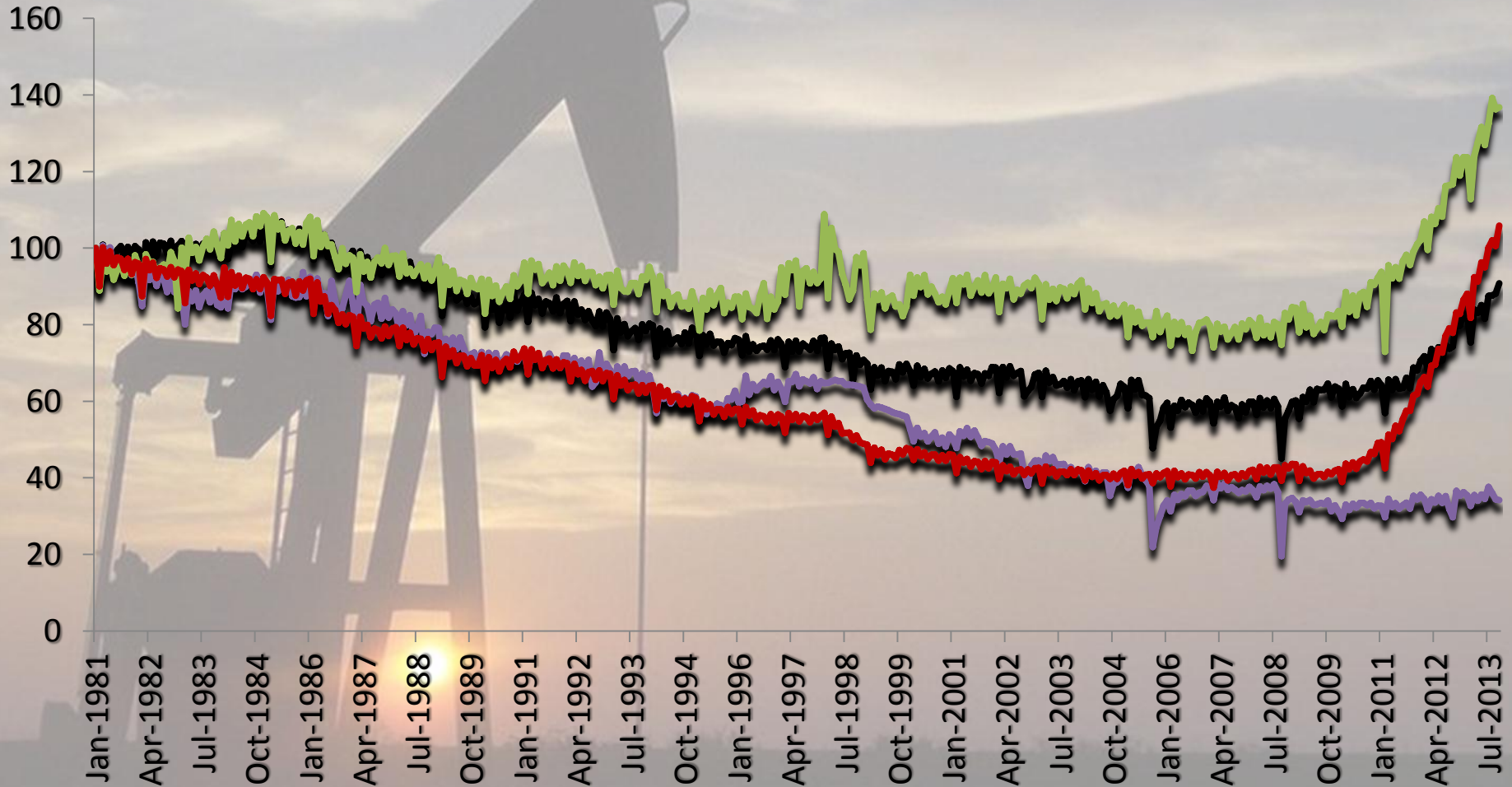
SOURCE: International Trade Commission. Author's calculations

Oil & Gas Extraction

30 years of production declines recovered

Index (Jan-81=100)

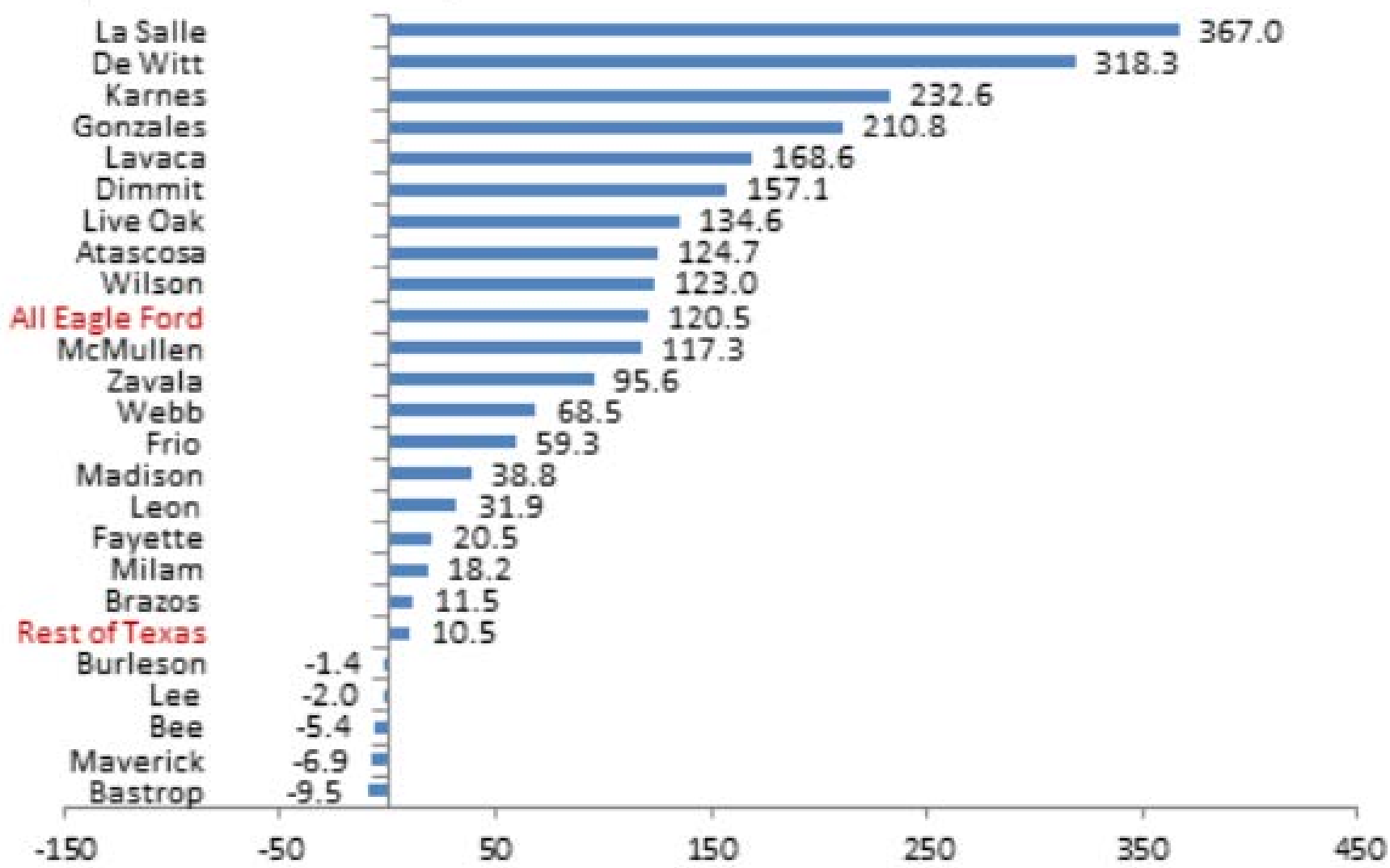
— U.S. — Louisiana — New Mexico — Texas



Annualized Percent Change in Oil Production

Across Eagle Ford Counties

First quarter 2010 to third quarter 2013



SOURCES: Energy Information Administration; Railroad Commission of Texas; calculations by Federal Reserve Bank of Dallas.

The WTI Discount

WTI price relative to Brent and LLS

