

Leveraging Economic Forecasts Through Qualitative Overlays

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R&S Economic Forecasts
in CECL

CECL Estimation Forecasting Requirement

Lifetime loss estimate from origination – replacing “incurred loss” model”, where

*“The measurement of expected credit losses is based on relevant information about past events, including historical experience, current conditions, and **reasonable and supportable forecasts** that affect the collectability of the reported amount. An entity must use judgment in determining the relevant information and estimation methods that are appropriate in its circumstances.”*

Source: Page 3, *Financial Instruments—Credit Losses (Topic 326)*, FASB, No. 2016-13, June 2016

Does CECL Require Quantitative Forecasting?

- CECL does NOT require a specific quantitative approach
 - **Qualitative overlays acceptable** for smaller institutions
- Auditors and shareholders will hold institutions to different standards
 - Large banks will be expected to use quantitative approaches
 - But no strict rules on scenario design, number or weighting
- Impact of future “reasonable and supportable” economic forecasts on loss estimates is required

How to Leverage R&S Economic Forecasts in CECL?

What are the options?

1. Qualitative overlay approach (Small Institution Solution)

- » Use forecasts and current conditions narratives to adjust historically-driven CECL estimate
- » Consider outlook of local economy – state/MSA
- » Consider risks to local economy (trade war, immigration, financial market uncertainty)
– captured in alternative scenarios

How to Leverage R&S Economic Forecasts in CECL?

What are the options?

2. Quantitative overlay approach

- » Select a single scenario to estimate CECL with a scenario-conditioned model
- » Run “shadow scenarios” to inform any qualitative adjustments

3. Probability weighted scenarios approach (Similar to IFRS 9)

- » Estimate CECL under several alternative economic scenarios
- » Compute a probability weighted average as the CECL estimate

4. Simulated scenarios approach (Theoretically Pure)

- » Estimate CECL under thousands of simulated scenarios
- » Compute CECL as the average loss across all paths

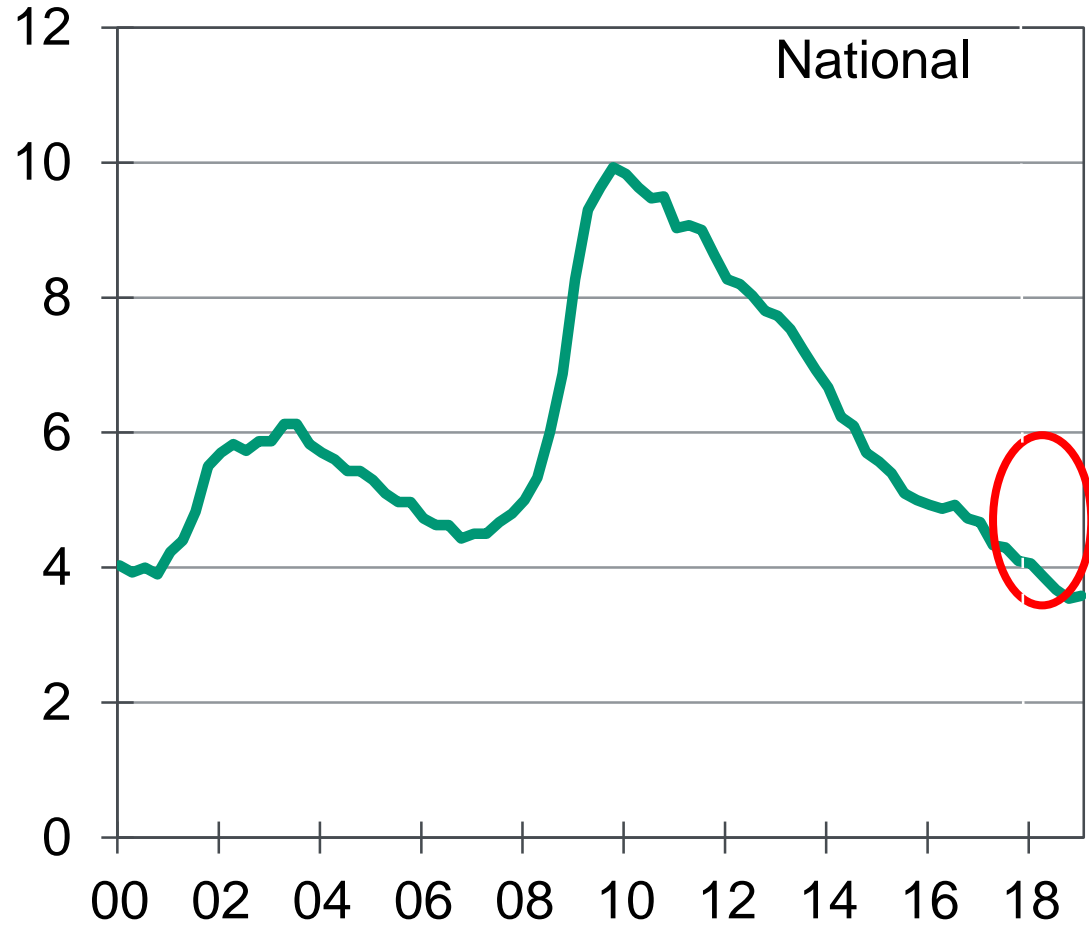
What Makes an Economic Forecast R&S?

- ☑ Based on **sound, generally accepted economic theory**
- ☑ Incorporates **inter-relationships and feedback effects**
 - A shock to one factor impacts all other factors over time
- ☑ Considers a **range of possible outcomes**
 - **Includes upside and downside risks**
- ☑ Provides information at varying **levels of geography**
 - **Captures local economic conditions**
- ☑ Utilizes a **rigorous, auditable process** for data and forecasting

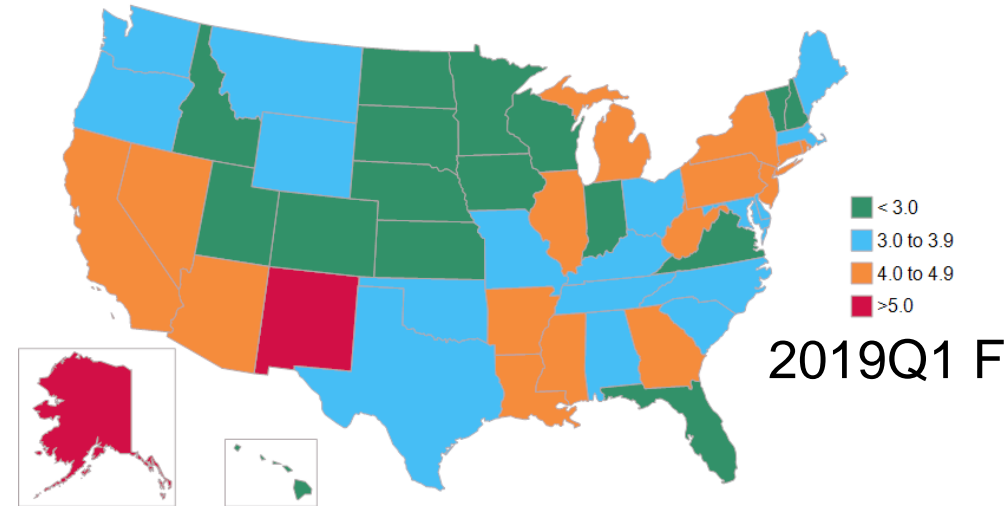


Integrated National, State and Metro-level Forecasts

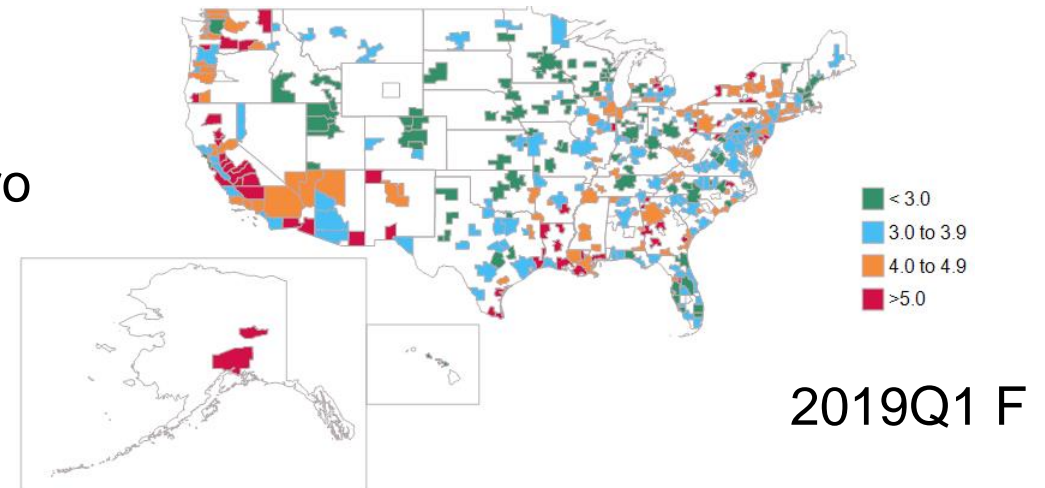
Unemployment rate, %



State



Metro



Qualitative Overlay Approach

Historical estimate adjusted for current & future conditions

★ Institution may use a vintage-loss rate approach to estimate losses based on historical experience

| Origination Year | Chargeoffs by Year | | | | | ALLL | | Vintage Data | | |
|------------------|--------------------|------|------|------|------|------------------------------|--------------------------------|--------------------------|------------------|--------------------|
| | 1 | 2 | 3 | 4 | 5 | \$ Remaining Expected Losses | \$ Unpaid Balances at EOP 20X5 | Expected & Actual Losses | \$ Originated | Lifetime Loss Rate |
| 20X-3 | \$ 6 | \$24 | \$16 | \$ 8 | \$ 2 | n/a | \$ - | \$ 56 | \$ 5,000 | 1.12% |
| 20X-2 | 2 | 26 | 21 | 8 | 2 | n/a | - | 59 | 5,000 | 1.18% |
| 20X-1 | 1 | 20 | 14 | 8 | 2 | n/a | - | 45 | 5,000 | 0.90% |
| 20X0 | 1 | 20 | 14 | 8 | 2 | n/a | - | 45 | 5,000 | 0.90% |
| 20X1 | 1 | 22 | 16 | 8 | 4 | \$ 4 | 500 | 51 | 5,000 | 1.02% |
| 20X2 | 2 | 23 | 18 | 10 | 4 | 14 | 1,500 | 57 | 5,000 | 1.14% |
| 20X3 | 2 | 24 | 22 | 12 | 2 | 36 | 2,500 | 62 | 5,000 | 1.24% |
| 20X4 | 2 | 26 | 21 | 8 | 2 | 57 | 3,500 | 59 | 5,000 | 1.18% |
| 20X5 | 6 | 24 | 16 | 8 | 2 | 56 | 4,500 | 56 | 5,000 | 1.12% |
| 20X6 | 5 | | | | | \$ 167 | \$ 12,500 | \$ 490 | \$ 45,000 | 1.09% |

Shading represents realization

★ Adjust this calculated loss estimate based on an expected increase in unemployment within the geographic footprint

MOODY'S ANALYTICS
OMAHA-COUNCIL BLUFFS NE-IA

ECONOMIC DRIVERS

FINANCIAL CENTER | LOGISTICS

EMPLOYMENT GROWTH RANK

2016-2018: 235 (3rd quintile)
2016-2021: 226 (3rd quintile)

RELATIVE COSTS

LIVING: 92% | BUSINESS: 90%

VITALITY

RELATIVE: 102% | RANK: 124

BUSINESS CYCLE STATUS

STRENGTHS & WEAKNESSES

STRENGTHS

- Low costs, skilled workforce, strong population growth.
- Many high-wage management jobs.
- Construction is booming.
- Favorable age structure, above-average labor force participation.

WEAKNESSES

- Exposure to very weak farm economy.
- Below-average role for high tech.
- Worker shortages in some industries.

FORECAST RISKS

SHORT TERM: ↑ | LONG TERM: ↑

RISK EXPOSURE 2017-2022: 250 (4th quintile)

UPSIDE

- Stiff competition for labor spurs bigger pay gains, attracting more migrants.
- Banks benefit more from deregulation and rising interest rates.
- Facebook's high-profile data center attracts other data centers.

DOWNSIDE

- Construction turns out to be less of a driver because of labor shortages.
- Manufacturing hiring slows sooner.

MOODY'S RATING

Aaa

COUNTY AS OF MAR 13, 2014

INDICATORS

| 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 44.5 | 45.4 | 47.7 | 48.8 | 49.4 | 50.0 | 51.8 | 53.5 | 54.1 | 55.8 | 57.7 | 59.3 |
| 0.8 | 1.9 | 5.1 | 2.4 | 1.3 | 1.2 | 3.5 | 3.2 | 1.2 | 3.1 | 3.4 | 2.7 |
| 469.8 | 477.4 | 484.7 | 492.4 | 497.3 | 499.7 | 505.4 | 511.3 | 512.4 | 512.7 | 516.8 | 520.3 |
| 1.3 | 1.6 | 1.5 | 1.6 | 1.0 | 0.5 | 1.2 | 1.2 | 0.2 | 0.1 | 0.8 | 0.7 |
| 4.4 | 4.1 | 3.6 | 3.3 | 3.3 | 3.0 | 2.6 | 2.3 | 2.5 | 2.8 | 2.8 | 2.8 |
| 4.5 | -1.8 | 8.2 | 3.7 | 2.8 | 2.1 | 3.3 | 4.4 | 3.1 | 2.6 | 3.4 | 3.3 |
| 2.0 | 3.2 | 2.5 | 3.5 | 3.0 | 2.1 | 64.5 | 66.1 | 67.4 | 68.5 | 69.8 | 71.1 |
| 2,479 | 3,041 | 2,639 | 2,973 | 2,906 | 3,158 | 942.0 | 950.3 | 958.2 | 965.9 | 974.4 | 983.1 |
| 983 | 1,425 | 1,553 | 1,184 | 1,334 | 1,797 | 0.9 | 0.9 | 0.8 | 0.8 | 0.9 | 0.9 |
| 159.7 | 162.1 | 166.5 | 173.6 | 181.3 | 193.2 | 2.0 | 1.7 | 1.4 | 1.2 | 2.2 | 2.6 |
| 2,479 | 3,041 | 2,639 | 2,973 | 2,906 | 3,158 | 3,668 | 4,266 | 4,373 | 5,153 | 5,514 | 5,509 |
| 983 | 1,425 | 1,553 | 1,184 | 1,334 | 1,797 | 1,473 | 824 | 807 | 1,297 | 1,612 | 1,570 |
| 159.7 | 162.1 | 166.5 | 173.6 | 181.3 | 193.2 | 202.9 | 205.5 | 209.1 | 214.7 | 221.9 | 230.7 |

Recent Performance. Omaha-Council Bluffs has entered the late-cycle phase of its expansion, but there is no evidence the economy is overheating. Wage growth that is well above the state and U.S. averages has attracted job seekers, and firms quickly responded to an influx of new labor force entrants by stepping up their net hiring, which has kept the jobless rate below 3% even though the workforce is expanding at its fastest pace since 2010. Job growth has also broadened—the diffusion index, which measures the breadth of job gains, is the highest in three decades. Net hiring has notably improved in manufacturing, construction, and leisure/hospitality. The housing market is recovering as single-family starts are struggling, but multifamily building is soaring.

Drivers. A longtime staple of the region's economy, finance, has a tough act to follow after breaking higher in the first half of 2018 as gains in insurance and credit intermediation slowed, partly because of weakness in the regional banks such as the First National Bank of Omaha have a large share of loans. The region's farm economy, where credit conditions have been tight for the last 18 months to the highest since 2011. Banks will set aside capital more selectively due to concerns about farm income, rising interest rates and uncertainty in the global trade. The threat of farm products is weighing on soybean prices, and the overall economy is better positioned, impede gains. OMA's outsize rewards as sustained high oil prices, drilling, and more production from northern oil fields. U.S. rail shipments of petroleum products are up more than those of other products this year, and the pace has accelerated recently. Union Pacific and BNSF Rail stand to benefit.

Commercial construction. Commercial building will prove invaluable to maintaining payroll momentum through the end of next year. Since the start of the decade, the industry has supplied about one-fifth of the rise in non-farm payrolls even though it accounts for only about 5% of jobs. Commercial development is surging, and a key catalyst is the construction of data centers in parts of the country where energy is cheap. Facebook recently said its investment would be twice what it anticipated, more than \$1 billion in a structure that will take until 2023 to complete. Google and many others have data centers in OMA. Besides cheap electricity, office rents are low and the state ponies up generous tax incentives specific to tech investments in exchange for jobs. City plans for a \$290 million revitalization of its riverfront are also encouraging given the potential for private development.

Manufacturing. Another dark horse is manufacturing, which has been on a tear. Despite rising trade concerns, factories in OMA are responding to stronger growth in manufacturing production by hiring workers at the fastest pace since data began in 1990. Factory payrolls have soared 2,500 in the last 18 months to the highest since 2011. Factory jobs, in the 1990s, and the pace of manufacturing growth in 2019. Manufacturing provide a boost. Traditional drivers will provide comparatively less support; labor scarcity will impede stronger job gains as labor force growth retreats to a sustainable rate.

Roland Lindmayer | 1-866-275-3266
June 2018 | help@economy.com

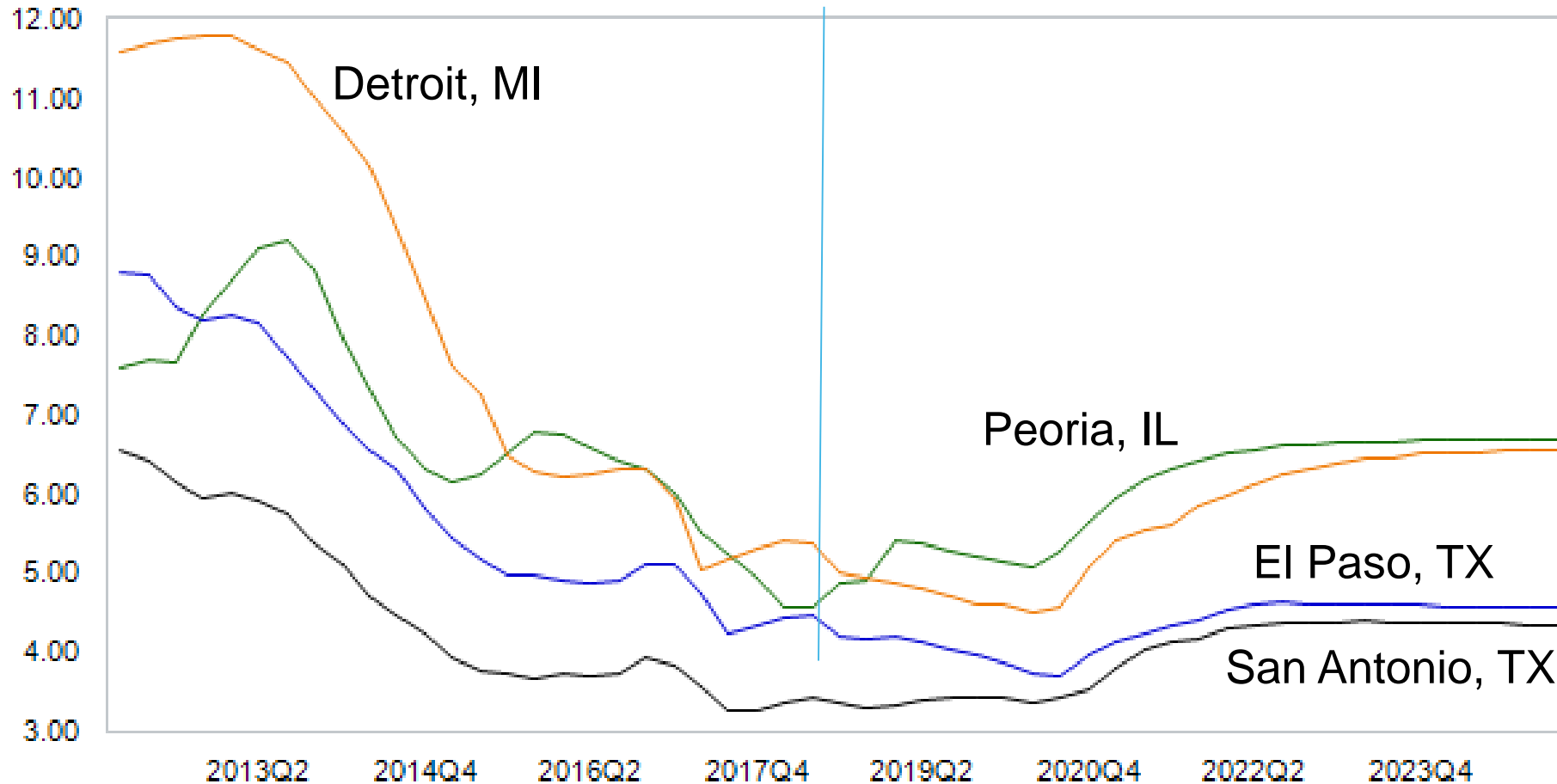
Current conditions and forward looking assumptions.

2

Local Economy Forecasts

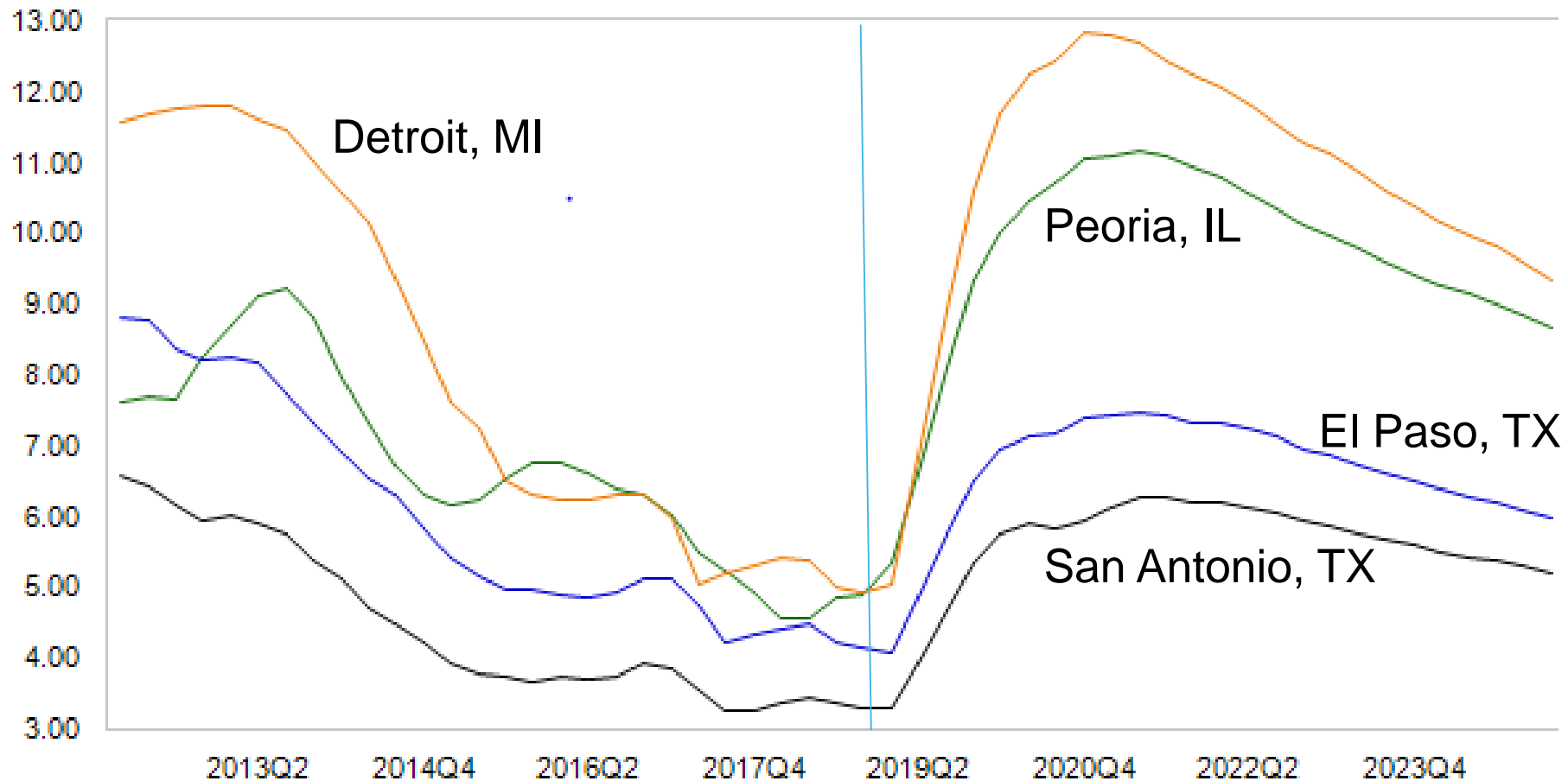
Capture Local Conditions...

Unemployment rate, %, under the most likely outcome



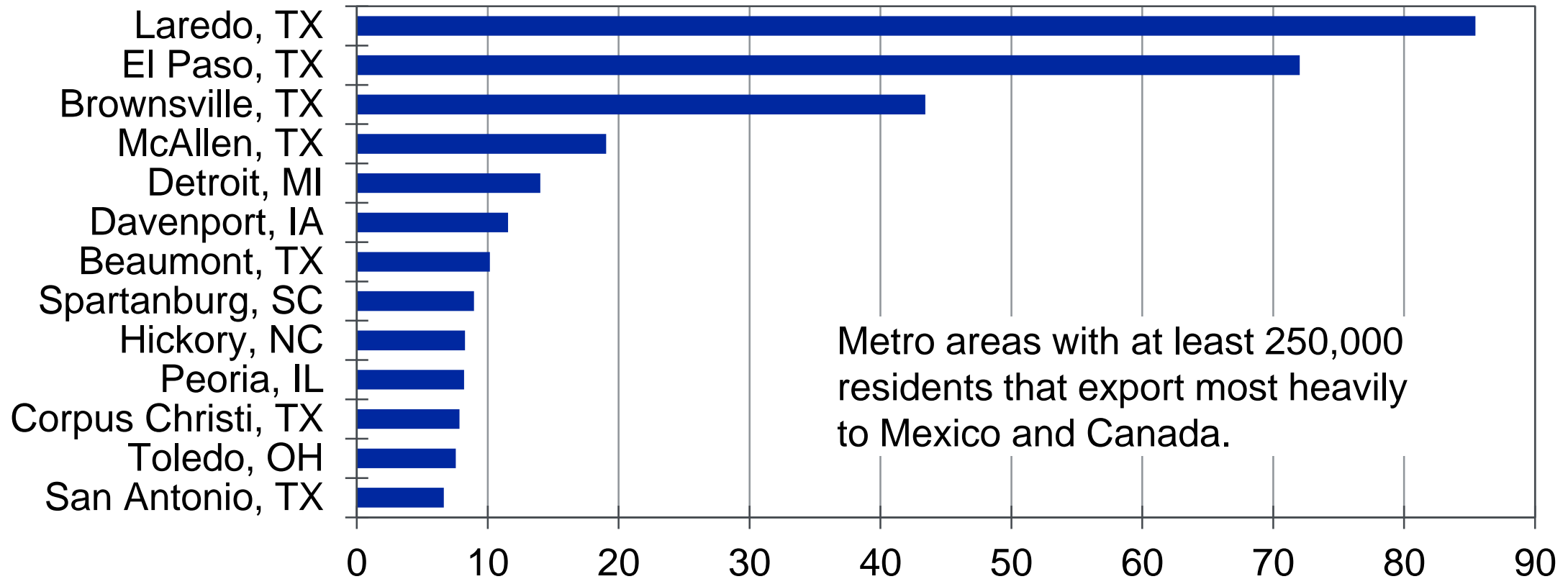
...And Exposure to Downside Risks

Unemployment rate, %, under a deep recession



Border Towns and Auto Hubs at Risk From Trade War...

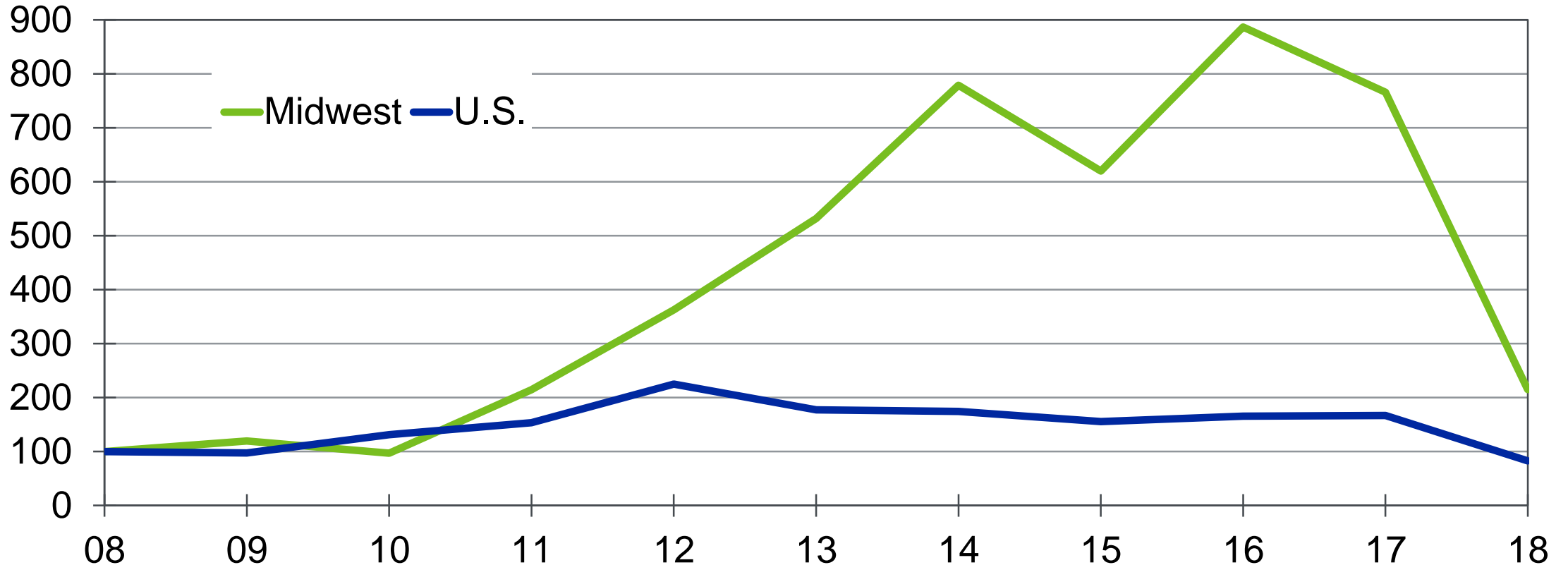
North American exports as share of GDP, 5-yr avg, 2013-2017, %



Sources: International Trade Administration, BEA, Moody's Analytics

... As Is Farm Output in Midwest

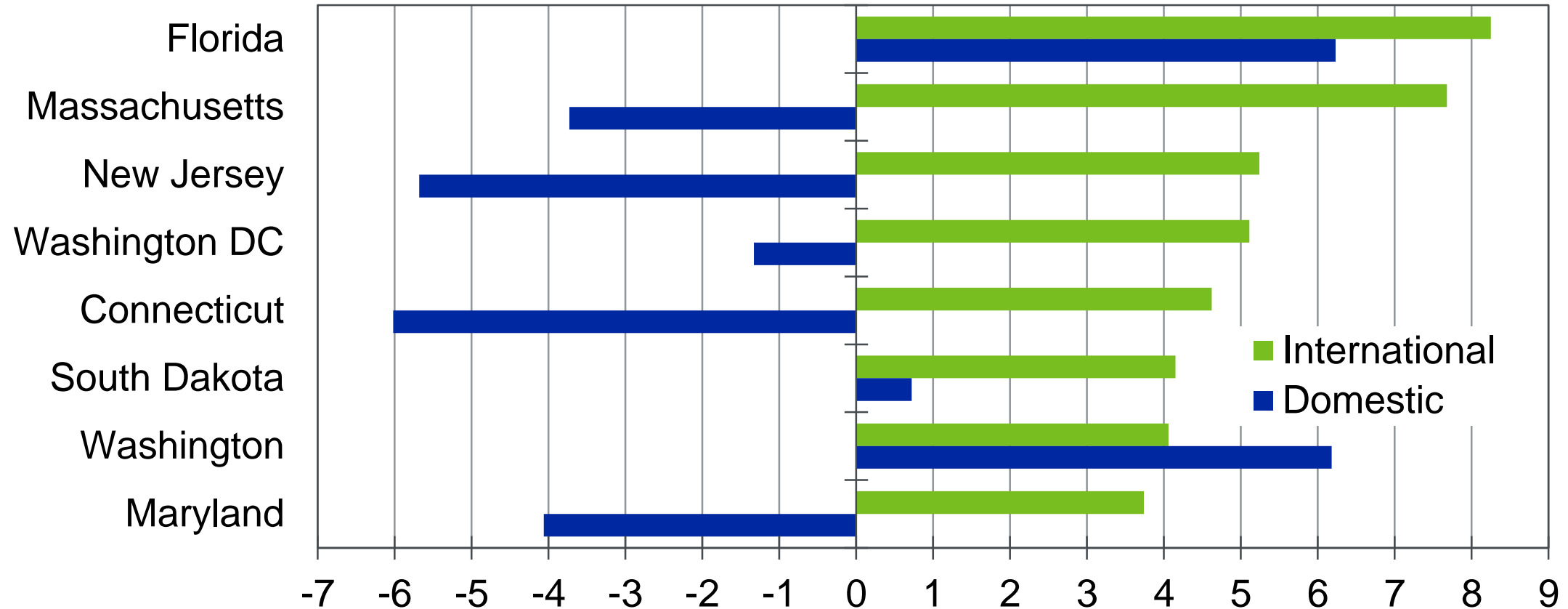
Crop exports to China, YTD through Oct, 2008=100



Sources: Census Bureau, Moody's Analytics

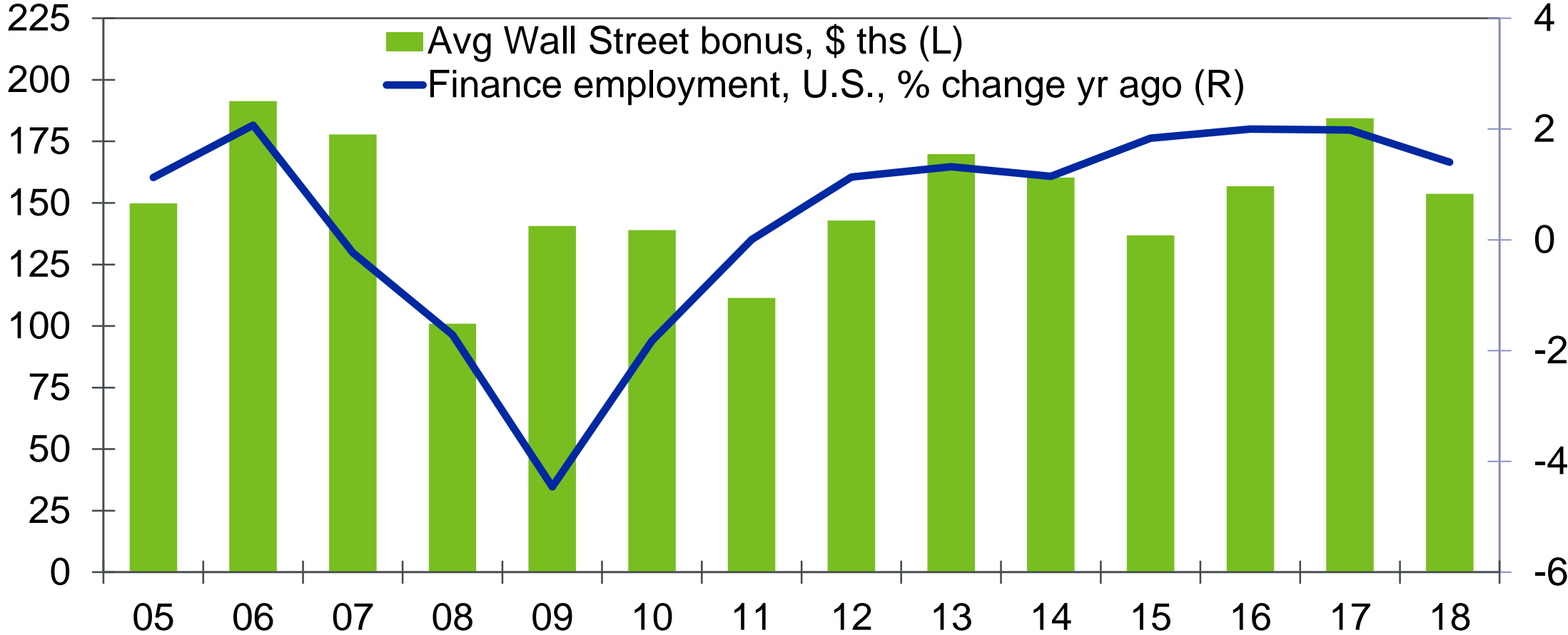
Florida, Northeast Exposed to Immigration Clamp Down

Net migration per 1,000 residents, 2018, #



Sources: Census Bureau, Moody's Analytics

Northeast Incomes Rely on Financial Services Health



Sources: New York State Comptroller, BLS, Moody's Analytics

Qualitative Overlays to Account for Regional Diff.

Assume that the starting historical portfolio loss rate is 1.20%
Apply qualitative adjustments to the regional sub-segments

| Region | Adjustment for Current Conditions | Adjustment for Future Conditions | Adjusted Loss Rate |
|------------------------|--|---|---------------------------|
| San Antonio, TX | -0.55% | -0.10% | 0.55% |
| El Paso, TX | -0.25% | 0.35% | 1.30% |
| Detroit, MI | -0.10% | 0.35% | 1.45% |
| Peoria, IL | 0.25% | 0.50% | 1.95% |

For More Information

Email

Sohini.chowdhury@moodys.com



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