Federal Reserve Bank of Dallas

Pandenomics and the Texas Economy: High-Frequency Data and the Texas Weekly Employment Estimate

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Federal Reserve Bank of Dallas

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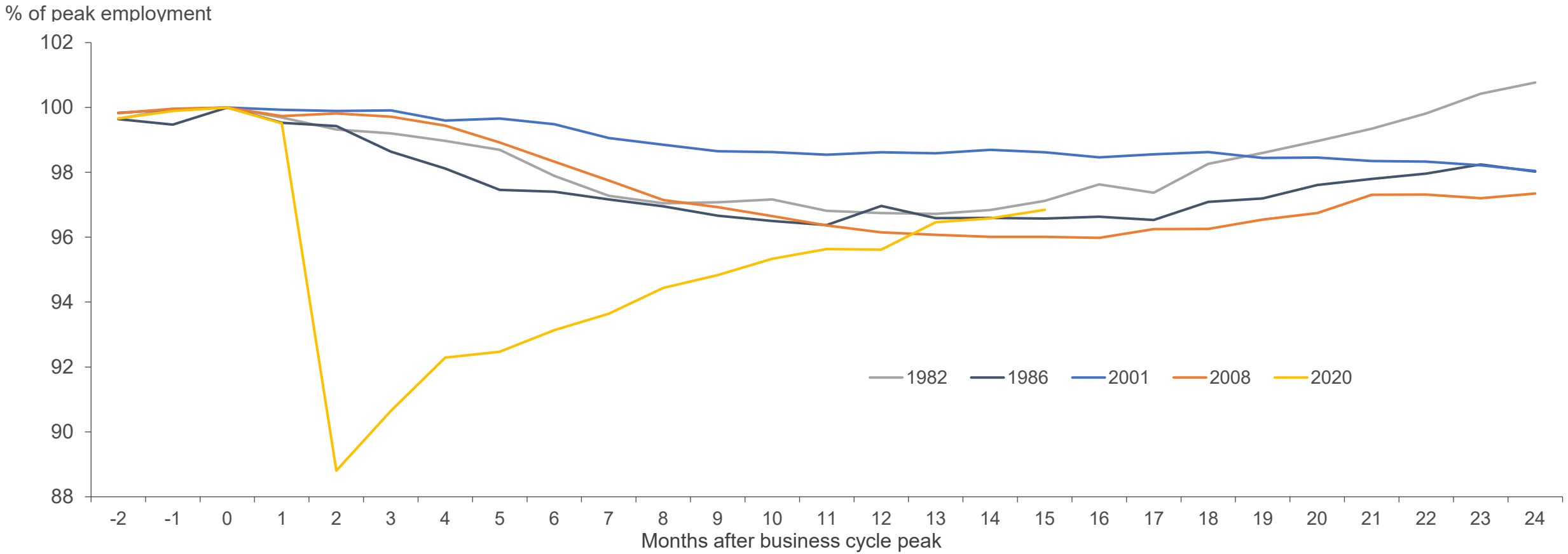
Overview

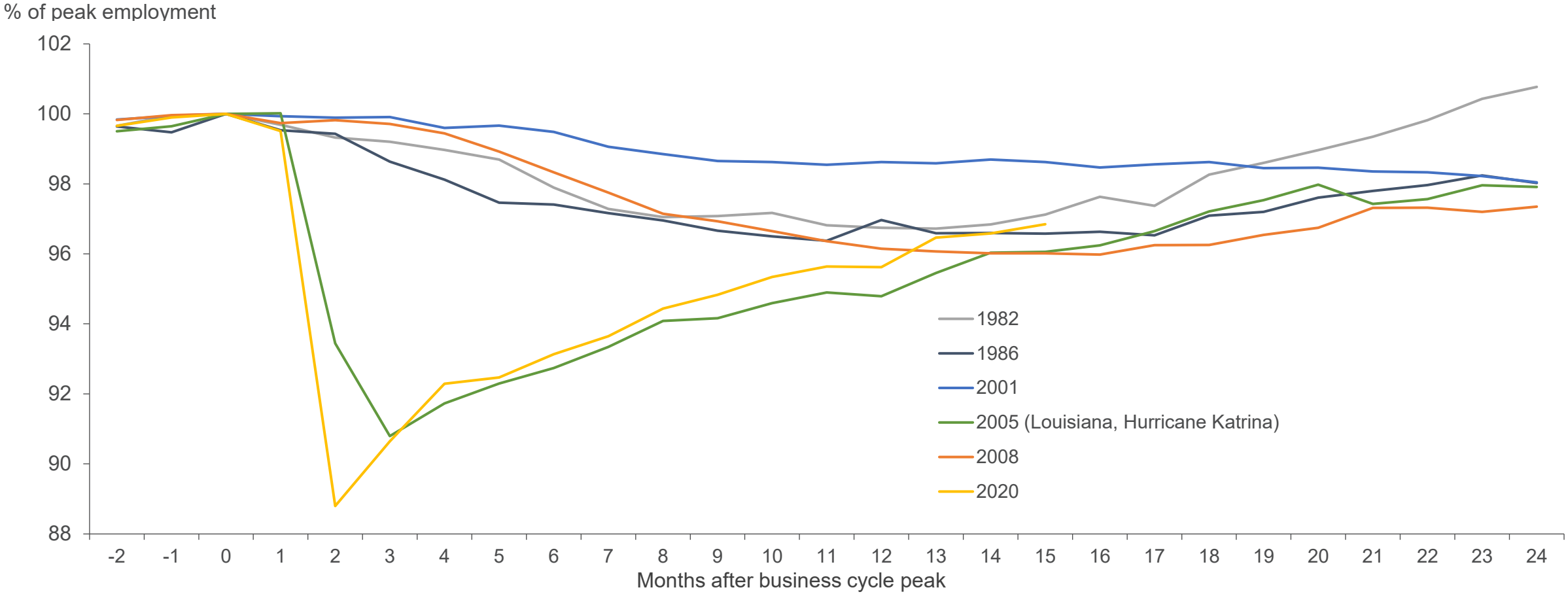
- Texas economy was in good shape pre-COVID
- Sudden sharp contraction in economic activity and employment in March and April 2020 due to COVID-induced shelter-in-place regulations
- Typically use monthly indicators such as unemployment rate, employment growth, Texas Business Outlook Surveys to assess current economic conditions
- Due to swift economic changes during the pandemic, monitoring high-frequency (weekly, daily) data in real time becomes essential
- Texas weekly employment estimate (TWEE) works as an almost real-time tool to monitor economic conditions.

This Texas Recession is Like No Other, However, Currently Near Same Place as in Past Recessions



NOTES: Shown is Texas nonfarm payroll employment. Recessions are indexed to on peak employment: March 1982, January 1986, March 2001, August 2008, and February 2020.
SOURCE: BLS.

Pandenomics: This Texas Recession More Like a Severe Natural Disaster



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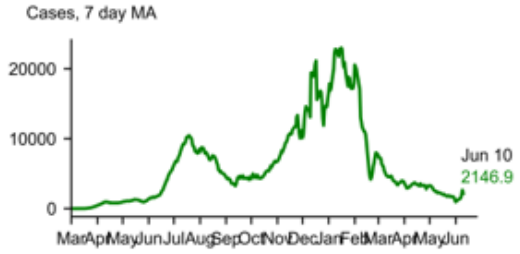
SOURCE: BLS.

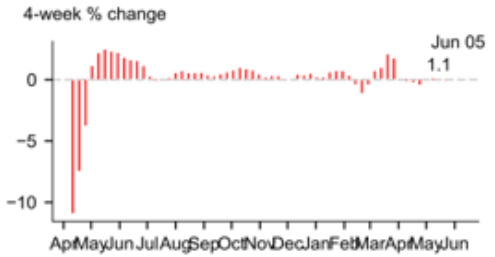
Regional Dashboard

Last update: 06/11/21

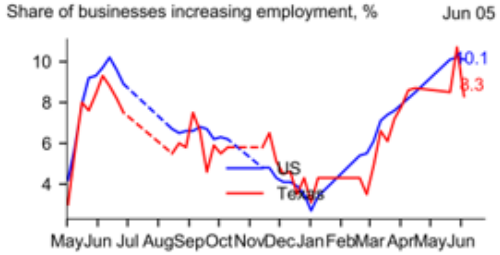
COVID-19 Cases in Texas



Texas Weekly Employment Estimate

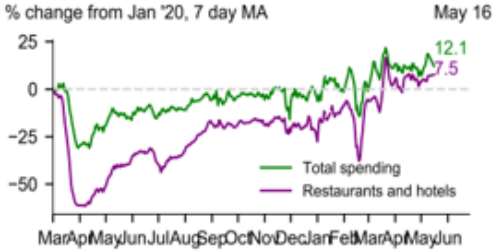


Census Pulse, Net Hiring

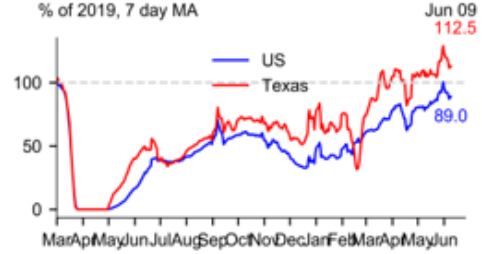


Homebase, Texas Hrs Worked & Hrly employment

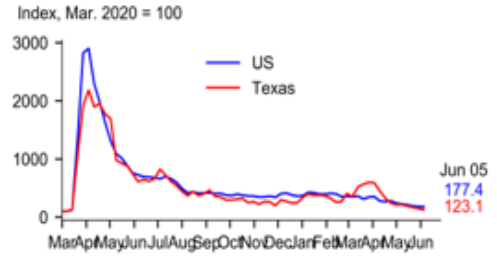
Debit/Credit Card Consumer Spending in Texas



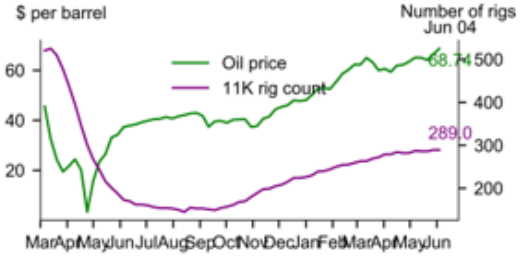
Dining Out



Weekly Initial Jobless Claims



Rig Count and WTI Oil Price



Sources and definitions

COVID-19 Cases This comes from New York Times data. The chart plots the seven-day average of new cases in the state.	Texas weekly employment estimate The Texas Weekly Employment Estimate (Texas WEE) is based on a Chow-Lin interpolation and extrapolation of monthly state employment data. The weekly series driving the Chow-Lin is a 2-week moving average of the estimated common factor derived from principal component analysis (PCA) using the following high frequency data: Texas unemployment claims, Homebase working hours, rigs, Google mobility, OpenTable reservations, and debit/credit card spending. Plotted is the 4-week estimated percent change in employment, and labelled is the annualized estimate of the most recent available month's growth, adjusted to coincide with the payroll data survey week.
Small Business Net Hiring This is from the U.S. Census Small Business Pulse Survey. The data shown is the share of respondents who indicated that their number of paid employees had increased over the previous week. The date shown refers to the final date each week on which responses were collected. Dotted lines indicate a break in the survey. No data was collected between June 27 and August 9 or between October 10 and November 14.	Homebase hours worked This is the percent change from January 2020 in hours worked by hourly employees at businesses that use Homebase software. Homebase is a free scheduling and time tracking tool used by 100,000+ small businesses and their hourly employees. Homebase's customers in the US primarily consist of restaurant, food & beverage, retail and services and are largely individual owned/operator managed businesses. This over-represents the hardest hit industries, and therefore fell further and bounced back faster than the labor market as a whole. The reference period is the median in January 2020 for the same day of week. It is a weekly average.
Debit/Credit Card Consumer Spending This is from Affinity Solutions, via tracktherecovery.org. It captures roughly 10% of all debit and credit card spending in the U.S. Here, only Texas is shown. It over represents categories where cards are used more for purchase relative to total consumer spending. For example, restaurants are over-represented while motor vehicles are under-represented. The data are reported relative to the average in January, and as a 7-day moving average.	Dining Traffic This is seated diners at a sample of restaurants on the OpenTable network across all channels: online reservations, phone reservations, and walk-ins, as a percent of 2019 levels for each day. It is shown as a 7-day moving average.
Weekly Initial Jobless Claims This is from the DOL. It shows weekly initial unemployment insurance claims, indexed to the beginning of March.	Rig Count This is an aggregation of the Texas, North Louisiana, and New Mexico Baker Hughes rig counts. It approximates the weekly rig count for the 11th Federal Reserve District. Oil Price From the EIA, this reflects the weekly West Texas Intermediate crude oil price.

Construction of the Texas Weekly Employment Estimate (TWEE)

- Need a way to summarize the information in a host of weekly indicators – what are these indicators telling us?
- Start by looking at the common co-movement of six key weekly series – statistical technique called principal component analysis
- Take this weekly summary series, and link it to monthly job growth

Components of Texas Weekly Economic Estimate

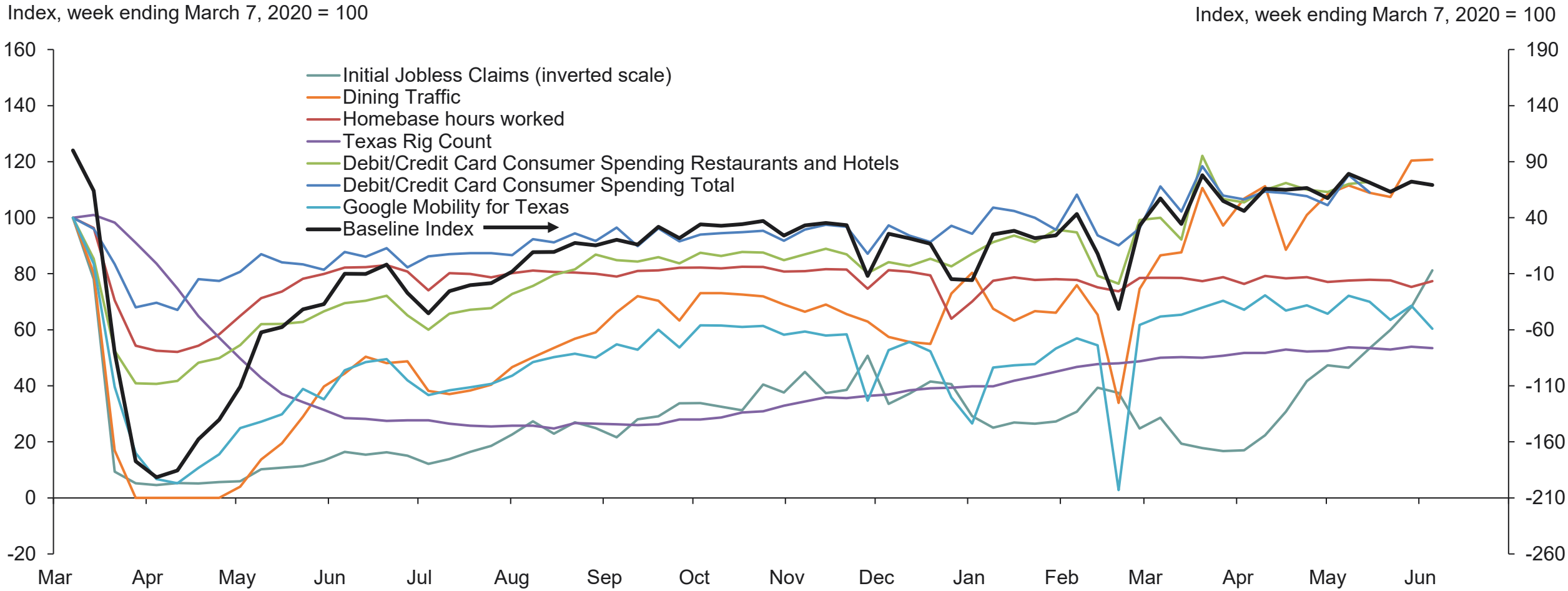
- Weekly initial jobless claims
- Debit/credit card consumer spending
- Debit/credit card spending at restaurants
  - For most recent weeks, debit/credit card data is missing so use OpenTable restaurant spending
- Homebase hours worked
- Oil and gas drilling rig count
- Dallas Fed Mobility and Engagement Index (MEI) for Texas (through April 2021)
  - Now use weighted Google Mobility Index

Principal Components Analysis Weights

Components mostly equally weighted except less weight on rig count

Series	Weights
Google mobility	0.45
Texas initial unemployment claims	-0.45
Texas rig count	-0.12
Homebase hours worked	0.41
All spending	0.44
Accmd and food spending	0.46
Total variance explained	67.3%

PC Index Shows a Strong Correlation with Weekly Activity Variables



NOTE: Labels fall on the first day of each month.
SOURCES: Texas Workforce Commission; OpenTable; Homebase; Baker Hughes; Affinity Solutions; Google; Dallas Fed.

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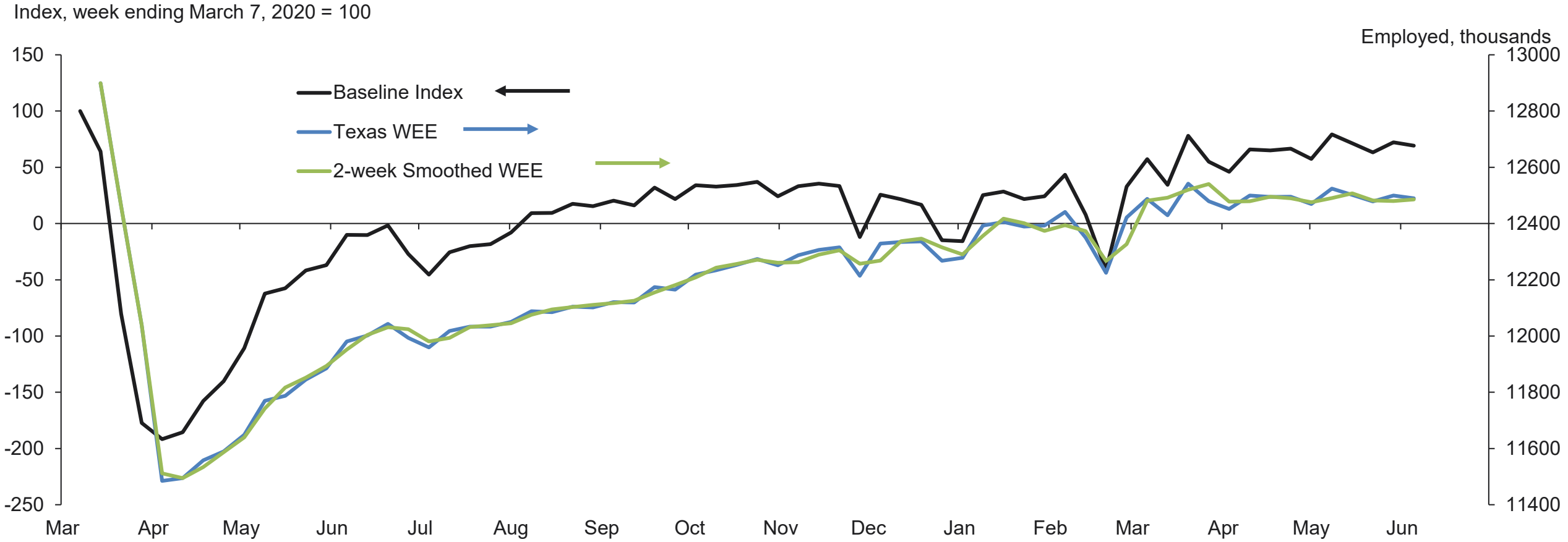
Weekly Activity Variables Signal Continued Employment Growth in May



NOTES: Labels fall on the first day of each month. The 2-week smoothed index uses a 2-week moving average of the baseline to estimate employment. The 3-week smoothed index uses a 3-week centered moving average of the baseline to estimate employment.
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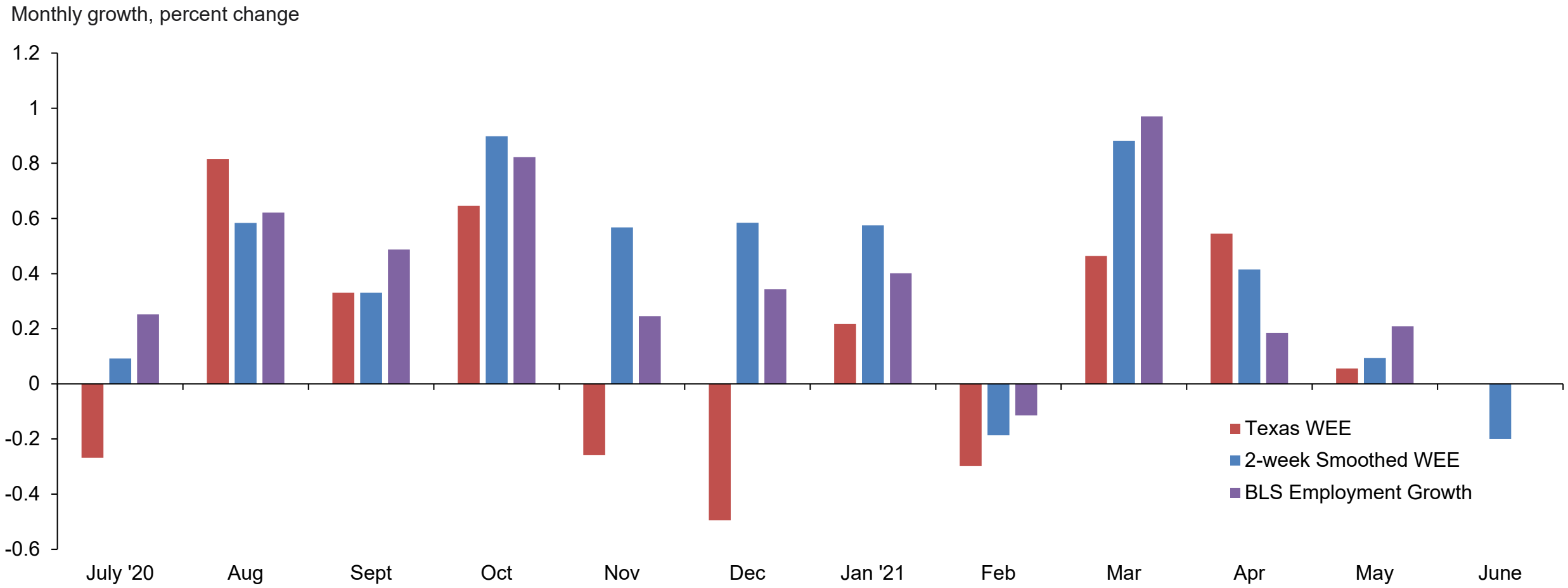
Real Time Analysis of TWEE

- Estimated co-movement of weekly indicators very volatile – which reduced the accuracy of the TWEE
- While we measured monthly change using the week including the 12th day of the month, the BLS looks at the payroll period including the 12th of the month
- Since payrolls vary – weekly, every two weeks, bi-monthly, monthly, etc., not clear what is best
- Weekly employment estimates were interpolated using three versions of co-movement index – unsmoothed, 2-week, and 3-week
- Two-week average works best

Real-Time Two-Week Smoothed TWEE works Best



NOTE: All other estimates taken from the day before official data for the indicated month was released. The 2-week smoothed index uses a 2-week moving average of the baseline to estimate employment. The 3-week smoothed index uses a 3-week centered moving average of the baseline to estimate employment.
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Summary

- COVID-19 made high frequency indicators essential to understand current economic conditions
- To meet this challenge, Dallas Fed sought out more high-frequency data to monitor quick movements in economic activity
- Aggregated the information from the key weekly variables into the TWEE by linking their movements to Texas job growth
- Currently, TWEE suggested Texas May job growth will be similar to the modest pace of job growth in April (1.3%) – came in at 2.5% vs revised 2.2% in April
- Early estimate of June is weak growth

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TEXAS Economic Outlook

Dallas Fed Resources

Publications and Surveys:

Texas Employment Forecast
Metro Economic Indicators
Regional Economic Updates
Southwest Economy
Heart of Texas
Dallas Fed Blog
National Economic Updates
International Economic Updates
Texas Business Outlook Surveys
Energy Survey

COVID-related:

Mobility and Engagement Index
Real-Time Population Survey
Texas Weekly Employment Estimate
Weekly Economic Index

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TEXAS Economic Outlook

Connections In the Classroom: Real Time Data and Real Time Problems

Morgan Ackley | Economic Education Advisor

6/22/21

Connections In the Classroom: Embed

- **Make a Prediction:** Interpret current economic data such as high-frequency data and other economic data found on the Dallas Fed website, to make a predication for economic growth 3 months from now.

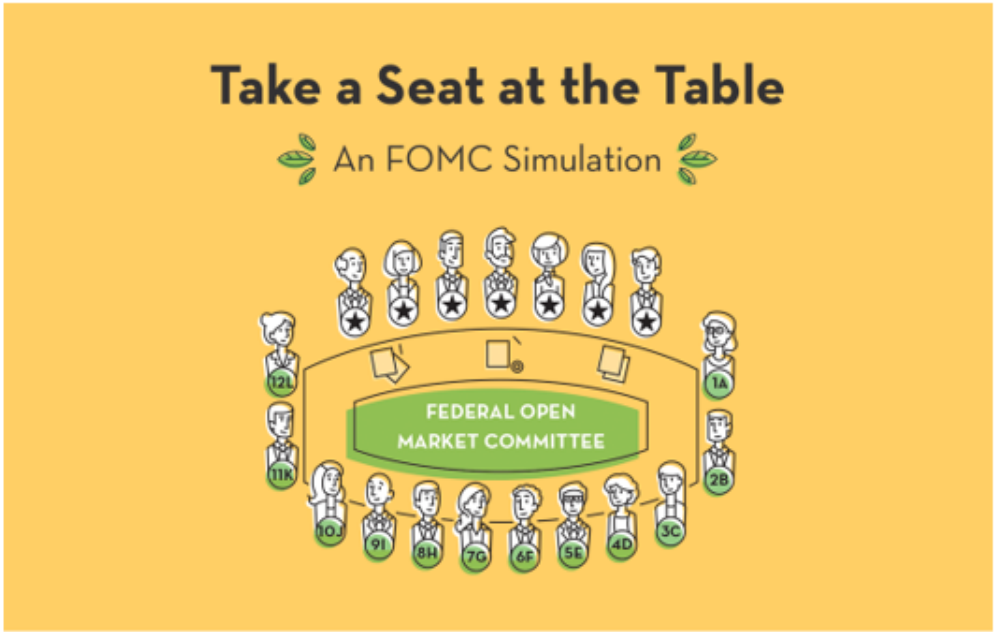
- **Conduct a survey:** Determine how many peers have geolocation turned on for their electronic devices.
  - Tell the story using data visualization such as charts and infographics.

- Texas Economic Indicators
- Texas Weekly Employment Estimate
- Weekly Economic Index
- U.S. Economy Charts

Connections In the Classroom: Extend Take a Seat at the Table Simulation

Take a Seat at the Table

- Students play the role of a Fed president in an FOMC meeting.
- Using the Beige Book, students will analyze one section of the book.



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Types of Risk

Upside Risks

What could happen in the economy that could cause overall ***prices to rise***?

Downside Risks

What could happen in the economy that could cause overall ***employment to fall***?

Upside and Downside Risks

Threats to stable prices (Upside Risks)	**Threats to maximum employment** (Downside Risks)
Increased sales	Sales are **down**
Spending remains **strong**	Consumer spending **weakened**
Occupancy at **high levels**	Manufacturing **declined**
Operating at **full capacity**	Orders were **soft**
Increased prices for inputs	Lending **contracted**
Loan demand is **brisk**	Activity was **slowing**
Activity continues to **advance**	Demand for hires **decreased**
Labor markets are **tightening**	Real estate markets **deteriorated**
Pickup in wages	Reports were **negative**
Construction is **robust**	Hiring **freeze**

Measuring the Economy