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Diffusion indexes of state and metropolitan area employment changes

The U.S. Bureau of Labor Statistics publishes eight diffusion index series that measure the dispersion of employment change across either all 50 states and the District of Columbia or 389 metropolitan statistical areas. These data provide a tool for analysis of employment changes and additional information about the labor market. This article explains how the diffusion indexes are calculated, examines the differences between the indexes, and describes how the data are interpreted and how the data respond during economic turning points and the coronavirus disease 2019 pandemic.

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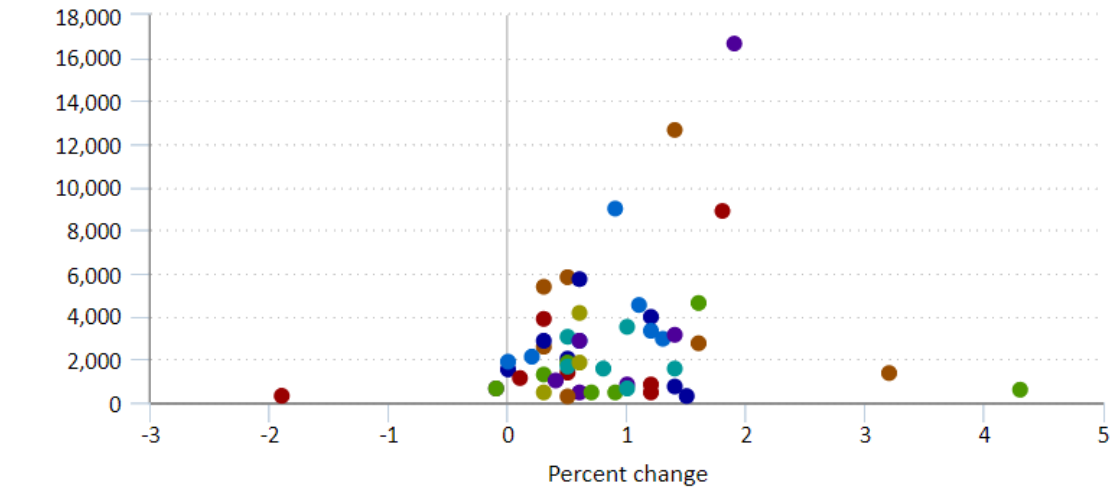
The Current Employment Statistics (CES) program has long used diffusion indexes to measure the dispersion of employment change across industries within both the private sector and the manufacturing sector over a specified timeframe. In July 2020, the U.S. Bureau of Labor Statistics (BLS) began publishing eight new diffusion index series, which use either 1-, 3-, 6-, or 12-month changes in seasonally adjusted total nonfarm employment for one of two geographic areas: for either all 50 states and the District of Columbia or for 389 metropolitan statistical areas (MSAs).[1]

The new diffusion index series provide an additional analysis tool for examining geographic dispersion of employment change across states and MSAs. The data give users more information about the state of the labor market by showing whether gains or losses are isolated to a small group of states or MSAs or whether the changes are more widespread across the country. This article uses data from the CES State and Area program to describe how the indexes are calculated and analyzes trends within the data.

Definition of diffusion index

A diffusion index is a measure of dispersion of change. Each diffusion index uses a set of components, CES employment data series in this case, to calculate one value representing how employment changed across that set of components. For example, the national total private diffusion index provides a summary measure of how its 254 component industries' employment changed. This information is useful because the same total private employment change could be caused by either large changes in a few industries or smaller changes across many industries. An index is produced by assigning a value of 0, 50, or 100 to each component, depending on whether its employment decreased, had no change, or increased over the given timespan. The index is then calculated as the average of these component values. An index greater than 50 indicates that more components increased than decreased, whereas an index below 50 indicates that more components decreased than increased. Index values farther away from 50 indicate a greater imbalance between the number of increasing and decreasing components, with an index of 0 or 100 indicating that all components decreased or increased, respectively. Chart 1 plots the 3-month percent change for June 2021 (representing the change from March 2021 to June 2021) of the 51 components of the all-states diffusion index (3-month span) to illustrate how the index value is calculated for June 2021.

Chart 1. Scatter plot of 3-month percent change and total nonfarm employment (in thousands) of all-states diffusion index components, seasonally adjusted, June 2021



Hover over chart to view data.
Note: In June 2021, 5 out of 51 components of the all-states diffusion index had 3-month decreases in employment and are assigned a value of zero when the diffusion index is calculated. (The dot on 0 percent represents a negative level change.) The remaining 46 components had 3-month increases in June 2021 and are assigned a value of 100 when the diffusion index is calculated. With increasing components outnumbering decreasing components 46 to 5, taking the average of all components results in an all-states 3-month diffusion index value of 90.2 for June 2021.
Source: U.S. Bureau of Labor Statistics.

Interpretation of a diffusion index

This section describes how to interpret CES diffusion indexes, both in isolation (i.e., as a single data point on its own) and with other data such as total employment change.

General analysis

As just mentioned, CES diffusion indexes are measures of the dispersion of employment change and can range from 0 to 100. A value of zero indicates that all index elements decreased over a given timespan, and a value of 100 indicates that all index elements increased over that timespan. It is important to note, however, that a diffusion index value of 50 does not necessarily mean that 50 percent of the index components increased while the other 50 percent decreased. An index value of 50 suggests that the same number of industries increased as the number that decreased, with any remaining components unchanged. For example, the 1-month diffusion index of total employment for all states has a value of 50 for July 2003, which references the employment change from June 2003 to July 2003. During this period, employment in Vermont remained unchanged, with the remaining states and the District of Columbia split evenly between increases and decreases in employment. The value of 50 is best viewed as a reference point for the diffusion index, with values greater than 50 indicating that more components increased than decreased and with values below 50 indicating that more components decreased than increased over the timespan. The greater the distance from 50, the greater the imbalance between increasing and decreasing components. To illustrate this point, look at the all-states 1-month diffusion index for June and July 2021. In June 2021, increasing components outnumbered decreasing components 43 to 6 (Vermont and West Virginia were unchanged), resulting in an index value of 86.3. One month later, increasing components again outnumbered decreasing components, this time 50 to 1 (Oklahoma decreased), resulting in a July 2021 index value of 98.0.

Analysis with other data

CES diffusion indexes can provide additional context for other data that BLS publishes. BLS publishes national-level diffusion indexes for the total private sector and the manufacturing sector. BLS also publishes monthly data for the employment change in these sectors. Comparing diffusion index values together with employment changes can offer more detail about periods with similar employment changes. For example, national total private employment increased by 687,000 from October 2019 to January 2020. The same 3-month change occurred from May 2016 to August 2016. The January 2020 3-month total private diffusion index value is 58.0 and is lower than the August 2016 value of 62.7. The lower January 2020 index value means increasing industries outnumbered decreasing industries by less than they outnumbered them in August 2016. That is, the same 3-month increase of 687,000 was concentrated in a smaller number of industries in January 2020 than it was in August 2016.

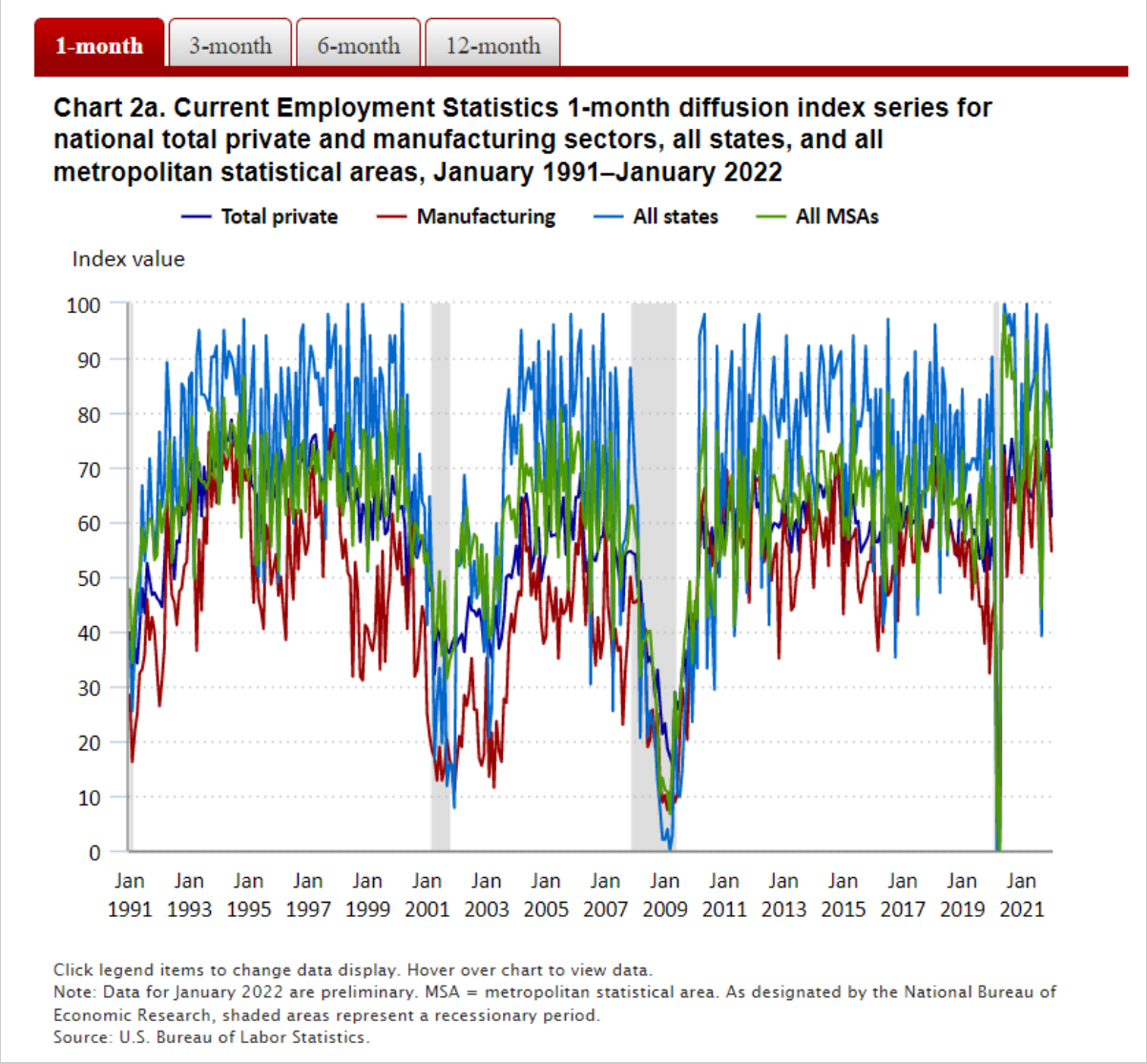
Data users should be aware that BLS does not publish any data representing a “sum of states” or “sum of MSAs” employment series. In addition, CES estimates of national employment are independently produced and are not an aggregation of statewide published estimates. CES estimates of MSA employment are produced independently from statewide estimates, and the sum of area estimates is not controlled to a certain proportion of statewide employment, just as the sum of all statewide estimates is not controlled to a national total. Nevertheless, the new diffusion index series for all states and all MSAs provide useful information on geographic employment change dispersion and can be used to complement employment analyses.[2] Consider again the two timeframes (May 2016 to August 2016 and October 2019 to January 2020) just discussed. For August 2016, the 3-month all-states diffusion index has a value of 86.3, which rose to 90.2 in January 2020. Both values are above 50, which indicates more states with employment increases exist than states with employment decreases in both periods, but the higher value in January 2020 relative to August 2016 means a greater imbalance exists between employment increases and decreases in January 2020.

Analysis and trends

This section compares the diffusion indexes with different timespans (for example, 1-month versus 3-months) and geographies (all states versus all MSAs) and discusses how the indexes behaved during past recessions and the coronavirus disease 2019 (COVID-19) pandemic.

1-, 3-, 6-, and 12-month indexes

Examining the diffusion index series reveals both similarities and differences between diffusion indexes of different spans. All the diffusion indexes follow the same general pattern, showing higher values during periods of employment growth and lower values during periods of declining employment. Diffusion indexes for all states and all MSAs appear less volatile as the timespan they reference grows. The diffusion indexes that reference over-the-month (1-month span) employment changes are much more volatile than the indexes calculated with 12-month spans. Using a longer timespan reduces volatility in the index because there is more time for a general trend in employment to take hold and outweigh any month-to-month variability. Chart 2 shows the full CES diffusion index series, separated into four panels by timespan (1-month, 3-months, etc.). The variability of each index decreases as the timespan of the index increases.



Consider the employment change between 2 months that would be necessary to change any individual diffusion index component's value from 100 to 0, or vice versa. For a 1-month diffusion index, the over-the-month change would only have to be in the opposite direction from the previous month's change. For a 12-month diffusion index, the monthly change would have to be not only in the opposite direction but also large enough to offset any net change over the 11-month period also being factored into the index value. If an individual state or MSA shows 11 straight months of employment increases, then a decrease in the current month would affect the 1-month diffusion index value of the component but would be more unlikely to change the 12-month value.

All states and all MSAs diffusion indexes

Interesting differences also emerge when comparing the all-states diffusion indexes to the all-MSAs indexes of the same timespan. A quick comparison reveals that the all-states indexes cover a broader range of values than the corresponding all-MSAs diffusion indexes. In fact, each all-states diffusion index reaches values of 0 and 100 at

certain points in the series (the minimum and maximum possible values). Of the four all-MSAs indexes, not one has reached 100 at any point in the series history. They only reached the zero extreme for the first time in April 2020, when the nation experienced the largest over-the-month employment decline in CES history dating back to 1939. Statistically, the likelihood of all 389 components of the all-MSAs index moving in the same direction is much lower than that for an all-states index with only 51 components. Comparing the range of the all-states diffusion indexes to the all-MSAs diffusion indexes highlights that even in periods in which employment is moving in the same direction across all states, employment can be moving in the opposite direction in some metropolitan areas. For example, before March 2020 (the start of the most recent recession designated by the National Bureau of Economic Research [NBER]), the only other month in which the 1-month all-states diffusion index reached zero (all components showing over-the-month employment decreases) is March 2009, toward the end of the previous recession. The value for the 1-month all-MSAs diffusion index for March 2009 is 6.7, bolstered slightly by 20 MSAs in which employment remained unchanged and another 16 MSAs in which employment increased.

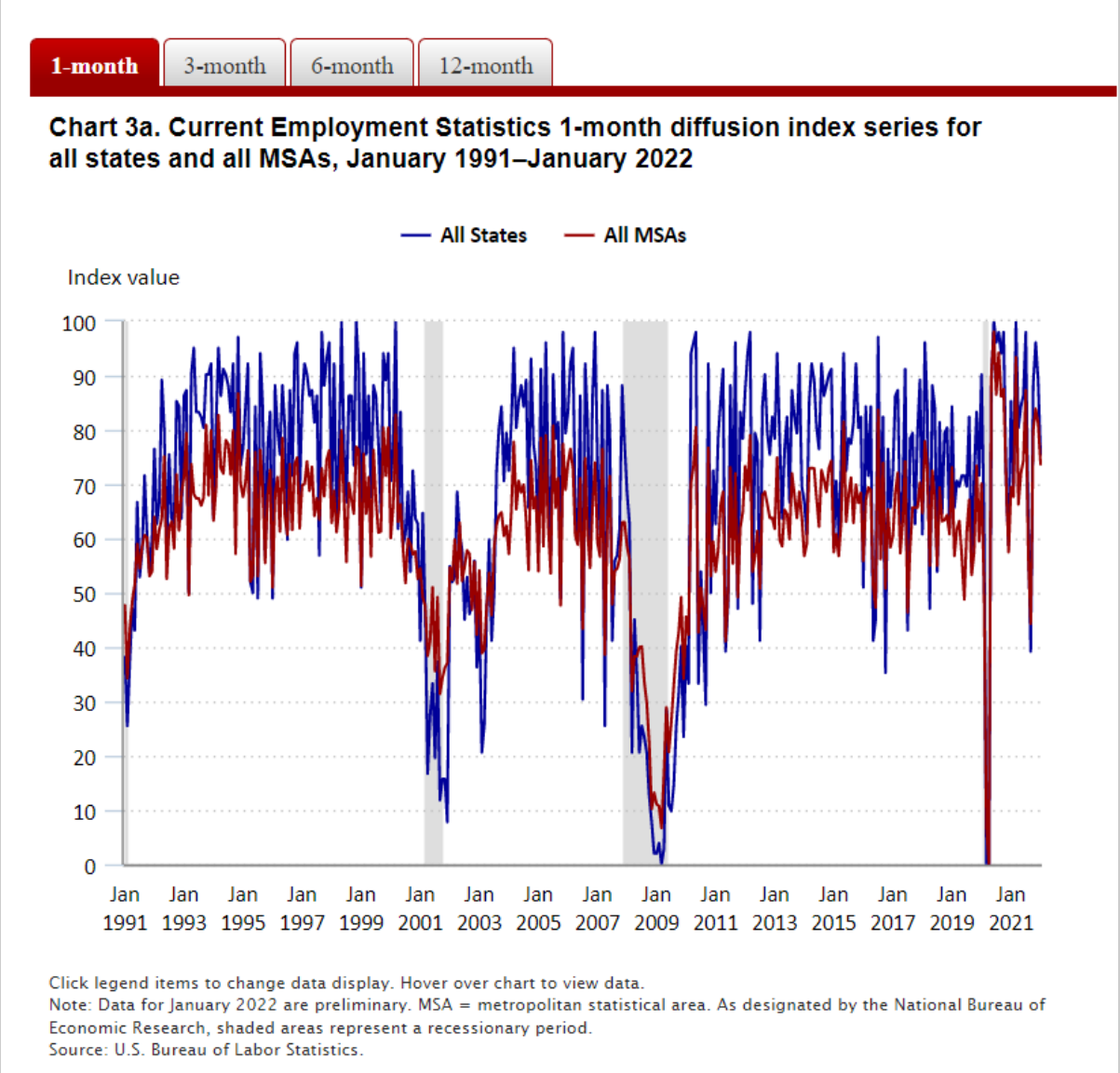
Excluding the February 2020–April 2020 recession and the subsequent recovery, the all-MSAs diffusion indexes for each timespan generally have stayed closer to the reference value of 50 compared with the corresponding all-states diffusion indexes, although the all-MSAs diffusion indexes' ranges increase as the timespan increases. The series high and series low values for the all-MSAs diffusion indexes, excluding March 2020 to the present, are available in table 1. The same all-states and all-MSAs diffusion indexes are presented in chart 3 for comparison.

Table 1. Lowest value, highest value, and range of all MSAs 1-, 3-, 6-, and 12-month diffusion indexes, January 1991–February 2020

Diffusion index span	Lowest value	Date of lowest value	Highest value	Date of highest value	Range (from high to low)
1 month	6.7	March 2009	86.7	November 1994	80.0
3 months	3.3	April 2009	89.4	September 1994	86.1
6 months	0.9	April 2009	94.3	September 1994	93.4
12 months	1.9	September and October 2009	97.2	February 1995	95.3

Note: MSA = metropolitan statistical area. Range is calculated by subtracting the lowest value from the highest value.

Source: U.S. Bureau of Labor Statistics.



Diffusion index response to economic business cycle changes

CES national data are released monthly, within about 3 weeks of the reference week. This timeliness makes CES data among the most important indicators of current economic conditions. When identifying business cycle contractions and expansions, the NBER uses employment data from the CES survey and the Current Population Survey, as well as other data, in determining the beginning and ending dates of the business cycle.[3] Diffusion indexes were at one time proposed to be used as leading indicators of business cycles, because declines in individual industries before a recession would be reflected in diffusion indexes sooner than in aggregate-level employment series. Previous research found that national-level diffusion indexes led employment peaks and troughs in the late 1970s and 1980s but by a wide time range (3 to 22 months for 1-month indexes).[4] Although the goal of BLS in publishing diffusion indexes is to provide a summary measure of employment change

dispersion, the leading properties are visible in the series histories before other more recent recessions. In the 12 to 24 months before the start of both the 2001 and 2008 recessions, all the indexes show a downward trend that levels off and then reverses at or near the end of the recessions. Table 2 highlights data points before, during, and after the recession in 2001.

Table 2. Current Employment Statistics national total private, national manufacturing, all states, and all MSAs diffusion indexes, 1-, 3-, 6, and 12-month spans, before, during, and after the 2001 recession

Diffusion index and span	Apr 1999 (24 mo prior)	Apr 2000 (12 mo prior)	Oct 2000 (6 mo prior)	Apr 2001 (1 mo into recession)	Nov 2001 (recession end)	Dec 2001 (1 mo after)	Feb 2002 (3 mo after)	May 2002 (6 mo after)
National total private								
1 month	67.8	59.6	55.7	32.2	37.7	38.9	38.7	42.0
3 months	67.6	68.4	54.7	41.4	31.6	33.4	36.7	35.4
6 months	67.6	72.1	55.3	46.5	34.6	31.4	30.3	32.6
12 months	69.5	71.9	66.0	50.2	37.3	35.5	31.6	30.3
National manufacturing								
1 month	39.9	50.0	38.5	16.9	14.9	10.8	20.9	26.4
3 months	39.2	56.8	27.0	14.9	10.8	10.8	9.5	13.5
6 months	38.5	59.5	38.5	21.6	7.4	3.4	8.1	8.1
12 months	36.5	54.1	41.9	20.3	8.1	6.8	4.1	6.1
All states								
1 month	86.3	61.8	72.5	16.7	15.7	7.8	52.0	60.8
3 months	96.1	98.0	73.5	35.3	9.8	13.7	33.3	62.7
6 months	98.0	100.0	80.4	52.9	7.8	5.9	17.6	47.1
12 months	98.0	100.0	96.1	70.6	13.7	11.8	13.7	17.6
All MSAs								
1 month	71.3	63.1	57.1	38.4	36.2	37.1	52.4	62.9
3 months	82.9	82.5	65.0	42.5	23.7	26.9	50.3	59.4
6 months	83.8	87.2	67.5	52.3	27.9	25.4	34.2	55.3
12 months	90.1	92.9	81.8	61.3	35.2	32.9	31.6	37.4

Note: MSA = metropolitan statistical area.

Source: U.S. Bureau of Labor Statistics.

Not surprisingly, all eight state and area diffusion indexes are lower on average during recessions than during periods out of recessions (expansions). The average value of each diffusion index during and outside of recessions is shown in table 3. With the exception of the 1-month indexes, which have individual months below 50 during expansionary times, the diffusion indexes only remain below 50 during or following recessions. It is important to note, however, that a downward trend in the diffusion indexes or values below 50 does not necessarily signal an oncoming recession. For example, both the 6-month and 12-month all-states diffusion indexes had values of 100.0 in January 2015 and trend downward to 73.5 and 81.4, respectively, in June 2016 before trending back upward to 100.0 in October 2018, all during an expansion period.

Table 3. Average value of all states and all MSAs diffusion indexes, by month span, during and outside of recessions

Diffusion index and span	Average during recession [1]	Average outside of recession (expansion) [1]
All states, 1 month	21.7	73.2
All states, 3 months	20.2	81.4
All states, 6 months	26.0	83.9
All states, 12 months	39.0	82.3
All MSAs, 1 month	30.9	64.1
All MSAs, 3 months	28.4	70.7
All MSAs, 6 months	30.1	74.5
All MSAs, 12 months	39.2	75.5

[1] Recession months include January 1991 (start of the diffusion index series) to March 1991, April to November 2001, January 2008 to June 2009, and March and April 2020, as determined by the National Bureau of Economic Research. More information is available at https://www.nber.org/cycles.html.

Note: MSA = metropolitan statistical area.

Source: U.S. Bureau of Labor Statistics.

It can be difficult to identify oncoming changes to a business cycle using only total employment change at a national level because gains in some industries can outweigh losses in others and vice versa. Adding diffusion indexes to analyses gives data users more information about the state of the labor market by showing whether gains or losses are isolated to a small group of industries or states or whether the changes are more widespread across the economy.

Diffusion indexes during the COVID-19 pandemic

The most recent economic recession began after the business cycle peak in February 2020 and lasted through April 2020, coinciding with the onset of the COVID-19 pandemic that affected many aspects of the labor market.[5] In the following months, historically large movements occurred in employment across the United States.[6] In March 2020, seasonally adjusted total private employment at the national level fell by more than 1.4 million, the second largest decline in the series history at that time (employment fell by nearly 1.8 million in September 1945, mainly in response to the end of World War II). In April 2020, seasonally adjusted total private employment at the national level fell by nearly 19.6 million. These declines were followed by the four largest increases in history:

- May 2020: more than 3.1 million
- June 2020: more than 4.5 million
- July 2020: nearly 1.3 million
- August 2020: more than 1.2 million

Individual diffusion index data points can help provide snapshots of information about the extent of the pandemic's impact and ongoing job recovery. Table 4 shows the diffusion index values since February 2020. All eight state and area diffusion indexes have a value of zero in April 2020, which means that April 2020 employment fell below March 2020, January 2020, October 2019, and April 2019 levels in all states and metropolitan areas. Low February 2021 values for the all-states (3.9) and all-MSAs (3.9) 12-month-span indexes indicate employment was only just beginning to recover to February 2020 levels at that time. In February 2021, only Idaho and Utah had over-the-year increases in employment (relative to February 2020), with employment in the remaining states and the District of Columbia lower than February 2020 levels, resulting in a 12-month all-states index value of 3.9. At the MSA level, employment in February 2021 increased over the year in just 15 out of 389 MSAs (8 of which are in Idaho and Utah), resulting in a 12-month all-MSAs index value of 3.9 for February 2021.

Table 4. Current Employment Statistics national total private, national manufacturing, all states, and all MSAs diffusion indexes, 1-, 3-, 6-, and 12-month spans, during the coronavirus disease 2019 pandemic, February 2020–January 2022

Date	National total private				National manufacturing				All states				All MSAs			
	1-mo span	3-mo span	6-mo span	12-mo span	1-mo span	3-mo span	6-mo span	12-mo span	1-mo span	3-mo span	6-mo span	12-mo span	1-mo span	3-mo span	6-mo span	12-mo span
Feb 2020	52.3	54.9	55.9	59.2	45.3	29.7	33.8	37.8	64.7	89.2	88.2	88.2	52.4	70.7	74.8	77.0
Mar 2020	20.3	35.2	39.3	45.9	23.0	29.1	25.7	29.7	0.0	6.9	29.4	56.9	6.9	23.4	41.5	54.9
Apr 2020	3.9	5.7	7.2	9.8	1.4	3.4	5.4	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May 2020	63.9	5.1	7.2	11.3	65.5	5.4	4.1	9.5	88.2	0.0	0.0	0.0	90.1	0.3	0.3	0.3
Jun 2020	74.0	6.6	7.4	11.7	72.3	5.4	5.4	10.8	100.0	0.0	0.0	0.0	98.1	0.3	0.3	1.2
Jul 2020	62.5	69.5	9.2	10.9	50.0	68.9	8.1	10.1	96.1	100.0	0.0	0.0	86.5	99.2	0.0	1.8
Aug 2020	70.3	76.2	8.6	11.9	56.8	73.0	8.1	11.5	98.0	100.0	0.0	0.0	94.2	99.0	0.9	1.9
Sep 2020	75.2	71.5	9.2	13.3	68.2	60.1	6.8	13.5	94.1	98.0	0.0	0.0	86.2	97.6	1.4	2.3
Oct 2020	70.3	76.4	76.8	12.7	63.5	68.2	71.6	10.8	98.0	100.0	100.0	2.0	87.5	97.3	99.0	3.2
Nov 2020	66.0	74.2	81.1	11.5	64.2	64.9	76.4	8.1	70.6	98.0	100.0	2.0	70.8	91.9	99.0	2.8
Dec 2020	63.9	70.9	75.0	16.4	70.3	65.5	58.8	13.5	58.8	81.4	100.0	2.0	57.5	78.4	98.7	4.0
Jan 2021	57.6	67.6	77.0	16.0	50.7	58.8	67.6	16.2	85.3	72.5	100.0	3.9	69.5	68.9	96.4	3.5
Feb 2021	65.0	67.8	76.8	17.2	63.5	67.6	70.9	16.2	69.6	88.2	98.0	3.9	67.7	76.1	92.3	3.9
Mar 2021	76.8	69.7	78.7	21.1	73.0	68.2	71.6	18.9	100.0	100.0	98.0	5.9	93.4	91.0	95.5	5.8

See footnotes at end of table.

Table 4. Current Employment Statistics national total private, national manufacturing, all states, and all MSAs diffusion indexes, 1-, 3-, 6-, and 12-month spans, during the coronavirus disease 2019 pandemic, February 2020–January 2022

Date	National total private				National manufacturing				All states				All MSAs			
	1-mo span	3-mo span	6-mo span	12-mo span	1-mo span	3-mo span	6-mo span	12-mo span	1-mo span	3-mo span	6-mo span	12-mo span	1-mo span	3-mo span	6-mo span	12-mo span
Apr 2021	65.2	77.3	76.2	77.7	60.8	73.0	66.9	73.0	80.4	98.0	100.0	100.0	66.3	88.9	90.9	99.7
May 2021	64.5	74.6	74.4	81.3	55.4	68.9	74.3	79.7	84.3	98.0	98.0	100.0	72.0	88.6	92.2	99.7
Jun 2021	66.6	71.9	73.6	77.1	66.9	66.9	70.9	67.6	86.3	90.2	98.0	100.0	74.3	80.2	91.8	99.2
Jul 2021	71.1	70.5	76.4	79.3	75.0	67.6	76.4	70.3	98.0	98.0	98.0	100.0	87.3	93.1	95.1	98.3
Aug 2021	67.6	72.1	75.8	78.7	55.4	71.6	75.0	76.4	61.8	100.0	100.0	100.0	56.8	91.1	93.6	97.4
Sep 2021	67.8	73.4	73.8	79.1	62.2	66.2	68.9	76.4	39.2	94.1	96.1	100.0	44.3	80.7	87.1	96.1
Oct 2021	73.0	74.0	74.6	78.3	67.6	66.2	70.3	75.0	88.2	75.5	100.0	100.0	79.8	68.8	92.2	94.5
Nov 2021	74.8	77.7	79.1	81.4	73.0	70.3	78.4	82.4	96.1	92.2	100.0	100.0	83.9	79.4	94.2	95.2
Dec 2021	73.0	82.8	83.2	80.7	64.2	82.4	77.7	75.7	89.2	98.0	98.0	100.0	81.2	93.7	94.0	96.7
Jan 2022	61.1	74.6	78.9	81.8	54.7	77.0	69.6	80.4	75.5	96.1	90.2	100.0	73.7	90.9	87.0	97.4

Note: MSA = metropolitan statistical area.

Source: U.S. Bureau of Labor Statistics.

Analyzing the diffusion index series together can also reveal some insights during times of large employment change. As just mentioned, all eight of the state and metropolitan area diffusion indexes for April 2020 have a value of zero, indicating a widespread pandemic-related impact across geographic areas. The national total private and national manufacturing indexes, which characterize changes across industries rather than geographic areas, range from 1.4 to 9.8 for April 2020. Although these values are low and indicate that the number of declining industries strongly outweigh the number of increasing industries, they are higher than the all-states and the all-MSAs diffusion indexes, suggesting that the pandemic-related employment impacts were less widespread across industries and more widespread across geographic areas. Intuitively, this result is logical: in April 2020, all states experienced negative employment impacts from the COVID-19 pandemic, but not all industries were similarly affected. While most industries saw employment declines in April 2020, some industries such as grocery stores and couriers and express delivery services had employment increases.

Conclusion

CES diffusion index series previously have focused only on the dispersion of national total private sector and manufacturing sector employment across component industries. The eight new diffusion index series using CES state and area data supplement analyses of employment trends by adding information about geographic dispersion. Monthly diffusion index data for 1-, 3-, 6-, and 12-month changes in total nonfarm employment for all states and all MSAs are published with the *Employment and Unemployment Summary* news release and are available for download in the public database.[7]

SUGGESTED CITATION

TJ Lepoutre, "Diffusion indexes of state and metropolitan area employment changes," *Monthly Labor Review,* U.S. Bureau of Labor Statistics, March 2022, https://doi.org/10.21916/mlr.2022.9

NOTES

1 For more information on seasonal adjustment, see “State and metro area employment, hours, & earnings: seasonal adjustment” (U.S. Bureau of Labor Statistics). New England City Town Areas in New England states are used as components of the all-MSAs (metropolitan statistical areas) diffusion indexes rather than MSAs. For more information on area definitions used in the Current Employment Statistics (CES) program, see “State and metro area employment, hours, & earnings: metropolitan statistical area definitions” (U.S. Bureau of Labor Statistics, Current Employment Statistics), https://www.bls.gov/sae/additional-resources/metropolitan-statistical-area-definitions.htm.

2 Monthly diffusion index data are published with the *State Employment and Unemployment* news release. For example, see *State Employment and Unemployment Summary*, USDL-22-0465, Economic News Release (U.S. Bureau of Labor Statistics, March 14, 2022). For the current and past editions of the release, see https://www.bls.gov/bls/news-release/laus.htm. For a schedule of upcoming releases, see https://www.bls.gov/schedule/news_release/laus.htm.

3 For more information regarding business cycle data, see “Business cycle dating” (Cambridge, MA: National Bureau of Economic Research, 2022), https://www.nber.org/cycles.html.

4 See Patricia M. Getz and Mark Ulmer, “Diffusion indexes: an economic barometer,” *Monthly Labor Review*, April 1990, https://www.bls.gov/opub/mlr/1990/article/diffusion-indexes-an-economic-barometer.htm.

5 For more information on the effect of coronavirus disease 2019 (COVID-19) on employment, unemployment, and labor turnover, see Ryan Ansell and John P. Mullins, “COVID-19 ends longest employment recovery and expansion in CES history, causing unprecedented job losses in 2020,” *Monthly Labor Review*, June 2021, https://doi.org/10.21916/mlr.2021.13; Sean M. Smith, Roxanna Edwards, and Hao C. Duong, “Unemployment rises in 2020, as the country battles the COVID-19 pandemic,” *Monthly Labor Review*, June 2021, https://doi.org/10.21916/mlr.2021.12); and Larry Akinyooye and Eric Nezamis, “As the COVID-19 pandemic affects the nation, hires and turnover reach record highs in 2020,” *Monthly Labor Review*, June 2021, https://doi.org/10.21916/mlr.2021.11.

6 Adjustments were made to the CES methodology to appropriately capture the extent of the job losses and subsequent returns. For more information, see Steven M. Mance, “Estimating state and local employment in recent disasters—from Hurricane Harvey to the COVID-19 pandemic,” *Monthly Labor Review*, April 2021, https://doi.org/10.21916/mlr.2021.9.

7 See *Employment and Unemployment Summary*, Economic News Release; and “State and metro area employment, hours, & earnings: featured SAE searchable databases” (U.S. Bureau of Labor Statistics, Current Employment Statistics), https://www.bls.gov/sae/data/home.htm.

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