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ABSTRACT

Using the recession recovery point equal to the month when private payrolls first exceeded their previous peak level, this paper argues that it was the negative secular trend in manufacturing jobs that was the most important determinant of the length and depth of the last three recessions/ recoveries. This negative secular trend changed the layoff/recall pattern of jobs in manufacturing into permanent displacements, a malady that lengthened the recovery periods and that is not the explicit target of either traditional monetary policy or traditional fiscal policy. Using the ideas gathered from an examination of the US two-digit sectoral data for the US overall, attention turns to the recession/recoveries of the 50 US states in the last three national recession periods. Regressions that explain the lengths and depths of the recessions in 50 US states reveal the importance of construction jobs, but the most important predictor was manufacturing jobs: the greater the share of manufacturing jobs prior to the recession, the worse was the recession/ recovery.

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A data appendix is available at http://www.nber.org/data-appendix/w28982

This paper presents an exploratory study of the relationship between features of the 2-digit sectoral employment levels preceding the US recessions and the subsequent lengths and depths of recessions and recoveries, first for the US overall and then for the 50 States of the United States. This search for precursors of severe problems could be a step toward formulating a well-targeted policy response to make the recessions shorter and shallower in a way that varies with the circumstances.

The first section deals with US national recessions and recoveries, first by offering a definition of the month when the recovery ends to accompany NBER peak and trough months, second by showing that the last three recessions had the longest recoveries and third by looking at jobs in NAICS 2-digit sectors to determine which sectors recovered early and which recovered late. It is the premise of this exploration that the sectors making the recovery long are those that recover late, which is an algebraic property of the recovery data but not necessarily a causal conclusion.

After a study of US GDP, unemployment and payrolls to define the recoveries, I have opted for the most easily determined choice for an "early" recovery point: when overall payrolls returned to their previous peak. This is "early" because at this recovery point the unemployment rate is typically above the level at the previous peak, and neither GDP nor payrolls are back to trend.

I report in this first section the recovery status of the employment levels in the 2-digit NAICS sectors when overall jobs returned to their previous peak. For example, on average over the first eight US recessions, when total payrolls returned to previous peak, durable manufacturing was still 6.2% below its previous peak, which is the lowest of any of the 2-digit sectors. In an accounting sense, manufacturing thus contributed most to making these first eight recessions longer.

An important takeaway is that employment in durable manufacturing in the first eight recessions had a distinct V-shape with the downward stroke of the V lasting almost a year and with the upward stroke restoring the durable manufacturing employment level in the third year. But in the last three recessions, jobs in durable manufacturing traced out an L not a V. Thus the historical path of temporary layoffs followed by recalls was replaced with permanent displacements. The permanently displaced workers needed to find new skills, new locations and new aspirations. That takes a lot more time, which is why the last three recoveries were very delayed.

I argue that the switch from V to L in manufacturing was caused by a change in the secular trend from positive to negative. Negative secular trends have also occurred in other sectors, including construction and information, which also are associated with delayed recoveries.

There are only eleven not-very distinct recessions in the US since 1948 and with only eleven observations it is difficult to identify variables that can be used reliably to explain the recession lengths and depths. I thus turn to three recessions experienced collectively by the 50 States of the United States: 1991, 2001 and 2008/09. Only three recession episodes are considered because the state 2-digit payrolls that I have used begin in 1990. To determine the depths and lengths of the recessions, the first step is to devise an algorithm to assign peaks, troughs and recovery points for all 50 states. I then estimate regressions separately for each of these three recession events to explain the depth equal to the job loss from peak to trough, the length in months between previous peak and recovery, and the severity which is depth times length. The explanatory variables are the previous employment shares in manufacturing, construction and information, all of which having been identified as probable contributors by the study of the US overall.

Although Leamer(2008) is on record of saying "Housing is the Business Cycle", it is manufacturing employment not construction employment that dominates the predictors of both length and depth in 2001 and 2008/09. The reason is that manufacturing has the most evident downward secular trend in employment and thus the biggest contributor to permanent displacements instead of layoffs and recalls.

There is a large related literature in labor economics that explores the problems of permanent layoffs. Lillien(1980) comes close to the themes of this paper by describing the prevalence of temporary layoffs followed by recalls in manufacturing in recessions, before the emergence of the negative secular trend in manufacturing jobs. John Haltiwanger has a number of pertinent publications regarding temporary/permanent layoffs including Haltiwanger(1984), Haltiwanger(1987) and Haltiwanger and Maccini (1994). Von Wachter et. al. (2011) is a study of layoffs in the 1982 recession, leading to Davis and von Wachter(2011) which highlights the greater effect of job losses in recessions than job losses in expansions.

The labor economics literature on temporary vs. permanent layoff is very interesting and very large but rarely connects to the macro-economic question: what makes recoveries take a long time? Groshen and Potter(2003) explore a closely related question: "Has Structural Change Contributed to a Jobless Recovery?" To identify industries with permanent layoffs they compare job growth in the recessions with job growth in the first twelve months of recovery. This is related to the negative secular trend viewpoint that is offered in this paper but not the same. The 2003 timing of this paper prevented a similar study of the Great Recessions and created a focus on the 2001 recession.

US Recessions and Recoveries

What's a Recovery?

"The NBER's traditional definition of a recession is that it is a significant decline in economic activity that is spread across the economy and that lasts more than a few months."[1] There are no official precise definitions of business cycle peaks and troughs, which are decided by an NBER committee of Ph.D. economists exploring multiple data series. But "peaks" and "troughs" of economic activity are pretty clear visual images that probably drive the committee deliberations. In particular, take a look at **Figure 1** which illustrates the US monthly unemployment rate with the official NBER recessions in yellow. A period of sustained increases in unemployment does a remarkably good job mimicking the NBER decisions, and when there is a conflict maybe it's the unemployment rate that gets it right.

Peaks and troughs are fairly easy to identify but the point when a recovery is completed and the economy is back to "normal" is a much more ambiguous situation. For example, take another look at Figure 1 and notice the long slow decline of the unemployment rate all the way to the end of many expansions. Can you see the end of the recovery there?

The academic literature on recoveries including Barthélémye.al.(2010), Fernald el al. (2017), Gali et al.(2012), Gadea et. al.(2017) focusses attention on the years immediately after the official NBER cycle

[1] https://www.nber.org/business-cycle-dating-procedure-frequently-asked-questions#:~:text=A%3A%20The%20NBER's%20traditional%20definition,more%20than%20a%20few%20months.&text=Expansion%20is%20the%20normal%20state,economy%3B%20most%20recessions%20are%20brief.

trough, often looking for exceptional growth of GDP and employment, though without making a recommendation of the point at which the recovery ends and a normal healthy economy returns.

For convenience and simplicity, I define the recovery point as the month when total payroll jobs returned to their previous peak level. This leaves the unemployment rate higher than its level at the previous GDP peak and the rate of growth of GDP is still exceptional, both suggesting that "normal" has not yet been achieved. My attempt to find an algorithm for identifying a later return to normal using either GDP growth or payroll growth or the unemployment rate did not produce a workable alternative.

Figure 2 illustrates the US total payroll data during the eleven expansions since WWII displayed from the cycle peak until payrolls first exceeded the previous peak, the proposed recovery point. The vertical axis in this figure refers to the percent difference from the cycle peak, with zero being both the peak and the point of recovery for all the expansions. The horizontal axis starts at the cycle peak and measures months after the peak. Vertical lines at the 12-month points identify years. The legend refers to the months of the cycle peaks at which the data display begins. One thing that jumps out of this figure is the long times for recovery from the last three recessions. We need to know why, and what fiscal or monetary policy might have made the recovery quicker.

In pursuit of better definition of recovery point, **Figure 3** illustrates US Real GDP cumulative growth from peak quarter to the quarter when payrolls first exceeded their previous peak level, including a 3% trend and a 2% trend. Every one of the episodes in this image has GDP returning to previous peak before payrolls did, usually not by much. When payrolls returned to previous peak, GDP exceeded its previous peak level by amounts ranging from 2.8% in the 1973 expansion to 11.7% in the 2001 expansion. That productivity gain in the aftermath of recessions reflects the emphasis on cost-cutting achieved by laying off the least productive workers and instituting new management rules and new capital investments to make the remaining workers more productive than they were before the recession began.

In the first eight episodes, real GDP collapsed downward for a few quarters and then when growth occurs it was at rates well in excess of the 3% normal, and the real GDP moved sharply upward toward the 3% trend line. That exceptional growth was occurring when GDP returned to previous peak, suggesting that the recovery was still ongoing. The last three expansions have been very different. The 1990 downturn was brief and shallow but the return toward the 3% trend was very tepid. The 2001 growth was along the 2% trend until 9 quarters and then seemed to try hard to get to the 3% trend line, but never made it. The 2007 expansion was quite unlike any of the earlier ones with a recession followed by pretty stable growth at around 2%. If we defined a recovery as a period of exceptional GDP growth based on the rehiring of workers discharged in the recession, then 2007 had no recovery at all. It just transitioned from the recession into 2% growth.

A recession could be defined as a sustained period of market failure during which there is elevated unwanted idleness of labor and capital. It's not growth; it's idleness, though these are related. The idleness definition seems to call for using a return to previous peak rate of unemployment to define the full recovery point. The unemployment data illustrated in **Figure 4** reveal that the unemployment rate was always above its previous peak level when payrolls returned to their value at the previous peak. Both GDP and the unemployment rate are therefore suggesting that the recovery was not completed when payrolls returned to their previous peak level. But a definition that calls for return to the unemployment rate at the previous peak has a problem with it: several of the expansions never experienced a return to previous peak unemployment rate. An alternative explored in Leamer(2009) is

to identify a full recovery point when the economy produces a plateau of stable unemployment which sometimes occurs While that is interesting, it complicates the definition of recovery, and I will use the return to previous peak employment measured by payroll jobs, which works well for the purposes here, even though it is an early call for the end of the recovery.

How long did the eleven recoveries last?

To make clear that the last three recoveries have been unusually long, **Figure 5** is a bar chart with one bar for each of the eleven expansions, with a blue segment representing the number of months from peak to trough and an orange segment representing the additional months until payrolls return to the previous peak. Until recently the recessions lasted a bit under 12 months and the recoveries occurred in another 12 months, under 24 months (2 years) in total. The previous peak was recovered in under two years in the first five recessions and the sixth was the first to exceed two-years, but by only one month. The seventh (1980) was very short-lived and then commenced a sequence of four expansions with variable length recessions but much longer recoveries.

Which Sectors Made the Recoveries Long?

Many academic papers have taken note of the slow recoveries, especially after the 2008/09 Great Recession, but a clear causal story has yet to emerge. Per Fernald et.al. (2009) the explanation was slow productivity growth and reduced labor force participation. Galí et. al. (2012) use a New Keynesian model to produce their "structural interpretation." "When we take a closer look at the recent episode we uncover a nonnegligible role for adverse wage markup and monetary policy shocks as factors behind the slow recovery. We interpret the latter finding as reflecting the zero lower bound on interest rates and the likely presence of downward wage rigidities." Gadea et.al. (2017) use cluster analysis applied to a set of measures to conclude: "According to the new measures, we identify that expansions before and after the beginning of the Great Moderation (1984) are clearly different."

This paper offers some preliminary exploratory work that lays the foundation for causal conclusions to come. The preliminary work is a study of the behavior of jobs in the 2-digit subsectors. Let's find out which sectors have the smallest percentage declines, which make the largest contributions to overall decline, and which ones bounced back the fastest. And let's determine how these properties have changed over time.

Table 1 reports the 2018 average employment levels in thousands and the percent of total by 2-digit sector. Mining and Logging is the smallest sector with only 0.5% of employment and Education and Health Services is the largest with 15.9%. The last column in this table has the mnemonics for all these sectors.

Figure 6 illustrates the percent change in sectoral employment at the recovery point when the change of overall payrolls was near zero. Black bars represent the average of the first eight episodes and the other three colored bars represent the last three episodes before our 2020 shutdown. Sectors are sorted by the black bars. The historical laggards have negative black bars and the sectors with early returns to previous peak have positive black bars. At the extreme left is durable manufacturing with a -6.2% black bar which means that durable manufacturing was still at 6.2% below previous peak when payrolls overall were already back to previous peak. The blue arrows pointing downward identify the sectors that were much more sluggish in the last three cases than the earlier average eight: durable manufacturing, information, nondurable manufacturing, construction, wholesale trade and retail trade.

The green arrows pointing up are the sectors that recovered more rapidly in the last three cases: Leisure and Hospitality, and Education and Health Services.

Permanent Separations are the main problem

One important reason for a slow recovery is the prevalence of permanent job separations. Every recession and recovery has workers who are laid off and then return to the same job or an equivalent job in the same sector, and other workers who are laid off and find themselves forced by circumstances to make an unwanted change in sector of employment or to remove themselves from the labor force. Sectors that are growing have layoffs in recessions followed by recall opportunities, but sectors which are shrinking while the economy is growing have mostly permanent displacements in recessions, which requires workers to find new jobs in new locations, with new skills and new aspirations. That can make the recoveries longer. The primary example of this problem is manufacturing which has had a secular negative trend since the 1980s. More recently, a negative trend has emerged in information, retail and wholesale, which is confirmed below.

Manufacturing has been a big part the problem

One of the most important reasons for the slowing recoveries is illustrated in the manufacturing employment data in **Figure 7** with log scales that allow straight lines to represent constant rates of growth This figure has three straight arrows, the first arrow identifying the period of generally rising employment in manufacturing and the other two identifying period of declining employment, the first labeled suggestively "Layoffs and Recalls" and the other two "Permanent Separations."

The reason why the underlying long-term direction of job growth separates the labor market performance into these two categories is explained with the two illustrations in **Figure 8**. Each illustration begins with a cost-cutting phase with a downward stroke representing the job loss and a shorter upward stroke representing the amount of hiring that is necessary to get back to previous peak output, allowing for the improvements in productivity put in place during the recession, as was discussed above. To that cost-cutting partial V is added a secular time trend to reflect the long-term trend in employment, contrasting up from down. The first illustration shows that when positive growth in demand is added to the recession cost-cutting, the result is a happy V: layoffs followed by recalls. The lower image adds to the cost-cutting partial V a secular decline, and that is what produces the lazy L, with permanent layoffs and no recalls.

The message of these images is that secular increases in jobs support a layoff and recall pattern but a secular decline creates permanently separated workers who may need to move to new locations and/or acquire new skills and/or greatly reduce their aspirations before they can find another job. That takes a lot more time than a recall.

The difference between "Layoffs and Recalls" versus "Permanent Separations" in manufacturing is made abundantly clear in Figure 9 which illustrates manufacturing jobs from cycle peak to cycle recovery point. Here we see the V-shaped patterns with a strong bounce back of manufacturing jobs except for the last three recessions: 1990, 2001, 2007. (2020 was a shutdown not a recession.) That confirms with the logic of Figure 8.

We may pause a moment to comment on the use of fiscal and monetary "stimulus" during the first eight recessions versus the last three. It is possible but not proven that fiscal and monetary policy could make the downward stroke of the manufacturing jobs V shorter, and could make the upward stroke

steeper which, in a more understandable language, means the recession would be briefer and not as deep. However, during the last three recessions policy should not have tried to create a V that could never occur. These manufacturing workers needed to be moved to other jobs, with new skills, new locations and new aspirations. It is possible but quite doubtful that fiscal and monetary policy might create high demand for workers in other sectors in other locations, making the transition away from manufacturing materially easier and quicker, but surely the best policy would focus directly on the affected communities, with counselling and retraining and relocation assistance. As a nation, we chose to ignore these communities, and that has ignited the political firestorm that is consuming our politics today.

If we learned from that mistake we would be alert to any other major secular negative trends that have been unmasked in our recent recessions, and we would design public policy either to slow those transitions or to facilitate them, helping out the adversely affected workers using tax contributions from those who profit from the negative secular trend. Amazon, for example.

Sectoral Details: The Other Troubled Sectors

Next we can take a look at graphs of the six other troubled sectors identified in the bars of Figure 6 (manufacturing, construction, information, retail and wholesale.) These time series graphs reveal the details that lie behind those bars.

Construction jobs are illustrated in **Figure 10** which reveals the biggest problem by far in construction jobs was in the 2007 episode following the Great Recession. My "causal" interpretation of this event offered in Leamer(2008,2015) is that the Federal Reserve stimulated the housing market with very low interest rates after the recession of 2001, even though housing did not suffer in that recession and even as housing starts were skyrocketing above 2 million per year when 1.5 million was the historical norm. Those low interest rates did not create a permanently higher level of demand for homes. They accelerated the construction of homes, taking sales from the future, making the recovery from the Great Recession longer.

Information jobs are illustrated in **Figure 11**. This sector used to bounce back quickly but not in the 2001 or 2007 episodes. Employment levels in the six subsectors of the *information* sector are illustrated in **Figure 12.** Here again we see the negative secular trend since 2000 in telecommunications, publishing and broadcasting. Some of the problem here was created by the Internet Bubble of the late 1990s but some of the reason for the negative secular trend was the power of the Internet and personal computers in driving job losses. While the Federal Reserve celebrated the Housing Bubble of the 2000s it expressed concern about the Internet Bubble, which is strange because the Fed probably had control over the Housing Bubble but not the Internet Bubble.

Figure 13 illustrates jobs in *wholesale trade* which like manufacturing have also been weak in the last three recessions. Retail jobs illustrated in **Figure 14** have flattened out like wholesale jobs. Both of these job categories have been affected by technological change that replaces workers with equipment.

Recessions and Recoveries of 50 US States

Based on what has been uncovered about the sectors that contributed to longer and deeper US recessions, I now study the variability of the depth and length of the most recent three recessions for all 50 states, seeking an explanation why some states had deeper and longer recession/recoveries than others.

Some of the total payrolls for each of the 50 states have strong and distinctive seasonal patterns, and the first step is to create seasonally adjusted data, which is discussed in an appendix.

Identifying Peaks and Recoveries

There are no official peak and trough months for US states. Rather than a committee of economists to decide collectively when the peak and trough and recovery occurred in each of these states, I will use an algorithm applied across all states, with a bit of additional tinkering after the algorithm makes its suggestions. The appeal of an algorithm over a committee is that objections to an algorithm can be relevant and decidable, while objections to the choices made by a committee may have little force unless you were there witnessing the discussion.

The focus here is on peak and recovery months. A recession and recovery form a sustained period during which payroll jobs are below their previous peak. An algorithm that identifies this period of sustained payroll shortfalls by comparing the seasonally adjusted payroll data with the previous peak falters with the nervous twitching of much of the data illustrated in **Figure 15** which has the official US recessions shaded. After some exploration, I have chosen to choose the peaks and recoveries by studying a 13 month centered moving average of the seasonally adjusted log data of total employment by state. **Figure 16** illustrates the California seasonally adjusted data, the 13 month centered moving average, and the (shaded) periods of time during which the centered moving average was below it's previous peak. The smoothed 13 month moving average tracks the actual peaks and valleys, and the algorithm has identified the periods of time when payrolls were below their previous peak. This algorithm isn't perfect. It has identified November 2007 as the beginning of a period of declined payrolls in California, with September part of the episode but October not. That stand-alone month of September 2007 can be fixed either by assigning it to the pre-recession period or assigning October to the recession. I have chosen the first option.

Much more tinkering is needed for Alaska. **Figure 17** has the periods in which the centered 13-month moving average of the AK log seasonally adjusted employment was below its previous peak. What we are looking for are the state equivalents of the three national recessions that occurred in three periods: August 1990 to March 1992, April 2001 to November 2001, and January 2008 to June 2009. The algorithm has revealed that Alaska had receding employment from 2015 onward. While it is appropriate to call that a recession, it doesn't match any of the periods of US recessions and will not be compared with recessions in the other states. **Figure 18** has a corrected image for AK with only one of the three national recessions represented. Corrected images like this one for all 50 states are in an appendix.

Table 2 has the length and depth of each of the three episodes based on the shaded regions in the appendix that identify the recessions/recoveries for all 50 States. The length is the number of months in the shaded regions and the depth is the difference between the minimum and maximum log seasonally adjusted employment values. Thus, for example, the first state, ALASKA, did not have recessions in the first two national episodes but in the third episode had a recession/recovery that lasted 16 months with

a maximum payroll decline of -.6%. Connecticut (CT) is the only state to be in the top five lengths all three times. The Great Recession (Episode 3) was longer and deeper in most states than the other episodes.

Explaining the Depth and Lengths of Three Recessions in 50 States

In preparation for the study of the variability of recession outcomes across US states, **Figure 19** illustrates the national employment shares of manufacturing, construction and information since 1987 with the official recessions in red and the periods during which total payrolls were below their previous peak in yellow except that payrolls in the last month of each recovery exceeded the previous peak. These three sectors are thought to be "foundation" jobs on which the other jobs are constructed. The foundation sectors sell most of their output outside the state, to other states or to other nations. These are the sectors in which a state earns revenues that can be used to purchase goods and services produced elsewhere. If these foundation jobs are established in a state, then they attract support jobs in restaurants, health care, education, government and so on. The apparent exception to this statement is the construction sector which sells it's output locally, but the finance needed to support the purchase of homes or other structures comes from the national or global bond market, bringing revenue that can be spent locally in restaurants and hospitals and schools.

The declining share of manufacturing until 2010 probably contributed to both the depth and the length of the recessions, since this created large numbers of permanently displaced workers who had to find jobs in other sectors, something that probably took significantly longer than the recalls that occurred after earlier recessions. The construction sector probably contributed to the length and depth of the 1990 recession and the 2008/09 recession when the share of construction jobs fell substantially but not much in the 2001 recession when the share of construction jobs was rather constant. The Information jobs share bubbled up in the late 1990s but fell from then on. Those jobs are likely to have had adverse consequences especially for the 2001 recession but also played a role in the 2008/09 downturn.

Table 3 reports the fractions of jobs in manufacturing, construction and information in the 50 US states in 1990, 2000 and 2006[2], the years before US recessions. These data will be used to explain the length

[2] The FRED website includes construction jobs state by state monthly from 1990 to 2020, except:

State	Construction Data
Delaware	Construction of Buildings
Hawaii	Construction of Buildings
Maryland	SMU24000002000000001SA
Nebraska	SMU31000002000000001SA
Tennesee	TNCONSN

and depth of recessions. The states in the top five in manufacturing in all three episodes are Arkansas (AR), Indiana(IN), Missouri (MS) and Wisconsin(WI). The fraction of jobs in manufacturing declined in all but two of the 50 states (ND and NV) from 1990 to 2000 and all but one (ND) from 2000 to 2006. These declines are expected to have played an important role in the length of the recession/recovery and also the depth.

Table 4 reports the summary statistics for 1990 shares and the changes in shares in the next two expansions. The initial construction job shares ranged from 1.7% to 8.0% over the 50 states. The increase from 1990 to 2000 ranged from -.9% to 3.2%, and the increase from 2000 to 2006 ranged from -.4% to 2.5%. What these numbers suggest is that the 2001 downturn did not involve a housing correction and overbuilding was a two-expansion cumulative problem. The manufacturing shares in 1990 varied from 0.39% to 26.4% and the subsequent declines were mostly negative in both expansions, as big as -7.0% in the 1990-2000 expansion. The information shares are the lowest of the three, and were generally growing in the 1990s but declining thereafter.

Table 5 reports summary statistics for the dependent variables. The first recession was rather mild with an average decline in jobs of 1.6% and average length of 22.8 months. The second recession was slightly deeper and a lot longer (40 months), but the Great Recession is the real outlier here with average depth of 6.7% and an average length of 80.8 months. Incidentally, the usual recession drives GDP below it's normal trend and during the recovery GDP growth is exceptional and GDP returns to trend. But the 2001 event brought GDP from above trend back down to trend which is a path that does not have a traditional recovery with exceptional growth. This path is one of a slight decline and a long recovery. It might be best not to call the 2001 event a recession but a correction for the irrational exuberance of the Internet bubble.

The last row of Table 5 reports the range of the length and depth variables, the maximum value minus the minimum. I have put a negative sign in front of depth so that a larger number means greater depth. For both depth and length, the range was smallest for episode 2, the 2000s, and largest by far for the Great Recession. I will use regression models to help explain why some states had deep and long recessions. The regressions now to be discussed explain three different variables that describe the recessions of the 50 states: the length, the negative of the depth and the product of the two which I will call severity. No regressions are reported that explain the length or depth of the 1991 recession because no variables are available that can capture what was happening in the expansion that ended in 1991.

Table 6 has regressions that explain the length and depth of the 2001 recessions across the 60 States. The column of regressions on the left has six explanatory variables, Construction, Manufacturing and Information shares in both 1990 and 2000. The 1990 data are included to capture dynamic effects like overbuilding. There are two explanatory variables that have t-values in excess of one for all three dependent variables but no coefficient attains a t-value of 2 or more. This is partly due to overwhelming the data with too many parameters to estimate.

The column of regressions on the right in Table 6 was designed to create coherent interpretable results by using the difference between the 2000 value and the 1990 value when the coefficients are opposite in sign and similar in absolute value or by setting coefficients equal to each other when the estimates are similar in magnitudes and the same sign, in which the case the variable becomes the average. In

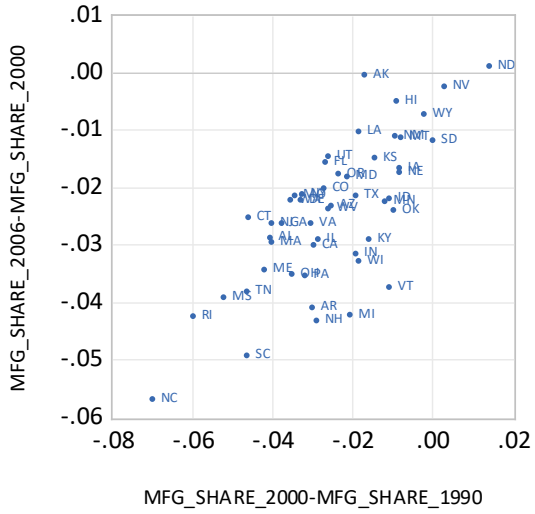
addition, variables with t-values less than one are omitted to maximize the adjusted R-squared and minimize the S.E. of regression, thus concentrating the data resource on a smaller set of questions. Finally, the variables are standardized to have unit standard errors, and the estimated coefficient are "beta-values" indicating how many standard deviations of the dependent variable are associated with a one standard deviation change in the explanatory variable. This we will use to measure the "importance" of the variable, and the t-value measures the statistical reliability of the importance measure. In each regression, the largest beta-coefficient and largest t-value are highlighted.

Focusing on the trimmed, standardized results, the standout variable is the manufacturing share. For explaining the *length* of the year 2001 recessions in the 50 States is the average of the manufacturing employment shares in 1990 and 2000. This variable has the largest t-value and the largest beta-value, which is positive, meaning that states with large manufacturing shares had long recessions in 2000. The manufacturing employment share stands out also for the depth and the severity (Length times depth). The average of the information employment shares in 1990 and 2000 has a statistically significant effect on the length of the recessions, and has a fairly large beta-coefficient. A large information share contributed to the length and depth, and a growing information share contributed to the depth. That makes a lot of sense since 2001 was a tech correction following the Internet Rush of the 1990s. The construction employment share coefficient is negative in all three regressions suggesting that a large construction employment share helped make the recession shorter and shallower, possibly because the States with large construction shares benefited at that time from the Fed's low interest rates. Information and construction played a role, but the crucial driver in 2001 was the size of the manufacturing employment share and the consequent permanent loss of manufacturing jobs.

Table 7 is a similar set of results for the Great Recession 2008/09 period with explanatory variables equal to construction, manufacturing and information employment shares in 2006, 2000 and 1990. The results on the left have a mixture of signs of coefficients and the results on the right with a reduced parameterization is again designed to make the results more understandable. All variables in the results on the right have unit standard errors and the coefficients are "beta-values." The largest t-values and the largest beta-values are highlighted.

Again manufacturing jobs contribute most noticeably to length, depth and severity of the recession, but here the manufacturing variable is not the level but the increase in employment share from 1990 to 2000 or to 2006. The change in share variables have negative coefficients which might seem hard to understand. The explanation for the negative coefficient lies in the scatter diagram at the right which compares the change in the manufacturing employment share from 2000 to 2006 with the change in the previous period from 1990 to 2000. What this scatter indicates is that a large decline in manufacturing employment in one period predicts a large decline in the subsequent period. What this suggests is that troubles in manufacturing before

Scatter Diagram Comparing Changes in Employment Shares



2006 probably predicted more troubles in the 2008/09 recession, and thus the negative coefficients in the regression.

For the depth of the Great Recession, the second most statistically significant and most important variable is the construction boom defined as the increase in construction share of employment from 2000 to 2006. The earlier increase in the construction share of employment from 1990 to 2000 doesn't help predict the problems of the Great Recession. An interpretation of that fact is the overbuilding was not a problem through 2000 and it was only the further increases after 2000 that needed to be corrected by the Great Recession.

For the severity variable, depth times length, it is the information employment share that has the largest beta-coefficient, but with a negative sign. The negative sign applies to all the other coefficients on the Information employment variables. In words, a small and declining information share predicts greater length, depth and severity. This is the opposite of the 2001 recession results. It could be that the job losses caused by the technological innovations were mostly suffered before the Great Recession when Tech helped make the recession shallow and short.

Conclusion

The basic goal of macroeconomics should be to help formulate policies that would make the behavior of the economy better and fairer. It isn't exactly news that overbuilding of homes in the period from 2001 to 2006 laid the foundation for many of the problems that emerged before and during the Great Recession, an idea that this data analysis has supported. The best policy probably would have been the choice of interest rates by the Fed in 2003-2005 that were high enough to cool off the housing bubble. The Fed's unwise low interest rate policy did much harm to many US communities, while the corrective actions taken by the Fed and the US government during and after the Great Recession mostly saved the complicit financial sector on Wall Street but left Main Street floundering with foreclosures and lost jobs in construction. This damage was concentrated on the lowest-income home owners and the communities they lived in, and also on communities where home construction collapsed, ending jobs for many low-income high-school graduates.

During the first eight recessions, public policy might have focused on making the first stroke of the recession V flatter and the second stroke steeper with a focus on manufacturing, especially durables, and housing. An appropriate treatment during the recession second stroke would be low interest rates to stimulate demand for durables. (The interest rate is the "price" of durables.) A policy that might have made the first stroke flatter would be higher interest rates late in expansions to prevent overbuilding of durables. However, when the shape of the manufacturing durables recession turned from V to L, public policy needed to be completely reformulated and focused on smoothing the decline of manufacturing jobs and on helping out the affected communities.

The role of declining manufacturing jobs in making our recessions deeper and longer lasting has not to my knowledge had the attention of housing, though housing too has been neglected and in 2005 I chose the wake-up title "Housing IS the business cycle." The long-term decline in manufacturing jobs from over 30% of jobs in 1950 to about 8% today has eliminated many of the best jobs for high school graduates, and devastated many communities around the United States. This decline in jobs was caused by a combination of technology, globalization and low savings. Process improvements in manufacturing have continuously increased worker productivity which means fewer manufacturing

workers unless that force is offset by a combination of population growth and product innovations. Globalization which integrates high-wage countries with low-wage countries shifts the labor-intensive manufacturing work to the low-wage countries, leaving the high-wage countries with fewer manufacturing jobs. In addition, a country with a low savings rate needs a real exchange rate that is high enough to create an external deficit large enough to close the gap between savings and investment. This can shift the workforce out of the tradables sector into the nontradable service sector work: fewer manufacturing jobs and more restaurant work. The biggest public policy contributor to this outcome is probably the large deficit run by the Federal Government. Policies to increase national saving like tax breaks to encourage more savings for retirement would help out, but the fundamental technological and globalization forces cannot be reversed.

Though economists have been taught to favor free trade, and most do, many economists may not realize that international trade can have winners and losers, and the right way to endorse free trade is to accompany the support for free trade with some thoughtful way to help the individuals, families and communities that are harmed by free trade. The United States has completely neglected these communities, and the people who remain have there been voting enthusiastically to end American democracy.

In conclusion, there is substantial evidence that the behavior of job shares in construction and manufacturing predicted the length, depth and severity of the last two recessions. The regressions that are used to support this conclusion have rather low R-squares, which means that there is a lot more than just manufacturing and construction that matter, and it remains to be seen if the results in all these regressions would be upended if other variables are included.

All this is looking backward but the negative secular trend in manufacturing may be at an end, in which case what we learned about the last three recessions may not tell us much about future ones.

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Tables

Table 1 *Employment in Subsectors of US Economy*

	2018 Average Thousands	%	Mnemonic
Total, Nonfarm	148,891	100.0%	PAYEMS
Goods-Producing			
Mining and Logging	727	0.5%	MINE
Construction	7,287	4.9%	CONS
Manufacturing			
Durable goods	7,945	5.3%	DMANEMP
Nondurable goods	4,742	3.2%	NDMANEMP
Service-providing			
Retail Trade	5,840	3.9%	RTRADE
Wholesale Trade	15,780	10.6%	WTRADE
Transportation and Utilities	5,980	4.0%	TR_UTIL
Information	2,837	1.9%	INFO
Financial Activities	8,589	5.8%	FIRE
Professional and Business Services	20,950	14.1%	PBS
Education and Health Services	23,636	15.9%	EHS
Leisure and Hospitality	16,299	10.9%	LAH
Other Services	5,831	3.9%	SERV
Government	22,448	15.1%	GOVT

Table 2 Length and Depth of Three Recessions: Five Extremes Highlighted

State	Length_1	Length_2	Length_3	Depth_1	Depth_2	Depth_3
AK	0	0	16	0.000	0.000	-0.006
AL	2	57	117	0.000	-0.031	-0.070
AR	0	46	90	0.000	-0.015	-0.091
AZ	4	16	101	-0.001	-0.004	-0.117
CA	62	41	77	-0.037	-0.014	-0.083
CO	0	55	57	0.000	-0.041	-0.059
CT	87	63	139	-0.057	-0.028	-0.059
DE	34	38	82	-0.021	-0.019	-0.066
FL	25	12	97	-0.016	-0.002	-0.117
GA	23	51	82	-0.016	-0.033	-0.079
HI	93	15	76	-0.023	-0.008	-0.067
IA	0	58	61	0.000	-0.027	-0.040
ID	0	13	81	0.000	-0.004	-0.085
IL	31	61	113	-0.014	-0.040	-0.078
IN	17	67	84	-0.007	-0.024	-0.078
KS	2	59	74	0.000	-0.029	-0.047
KY	0	59	80	0.000	-0.025	-0.060
LA	0	46	54	0.000	-0.013	-0.028
MA	59	58	85	-0.063	-0.049	-0.051
MD	53	4	77	-0.041	0.000	-0.041
ME	51	28	103	-0.048	-0.005	-0.045
MI	28	65	142	-0.016	-0.058	-0.145
MN	0	47	67	0.000	-0.014	-0.052
MO	26	62	91	-0.014	-0.025	-0.054
MS	5	70	142	-0.002	-0.024	-0.061
MT	0	11	61	0.000	-0.001	-0.043
NC	21	58	80	-0.014	-0.037	-0.163
ND	0	10	11	0.000	-0.003	-0.002
NE	0	34	50	0.000	-0.009	-0.027
NH	39	42	79	-0.055	-0.021	-0.042
NJ	71	43	107	-0.049	-0.009	-0.063
NM	0	0	125	0.000	0.000	-0.056
NV	6	14	105	-0.002	-0.007	-0.224
NY	93	61	47	-0.059	-0.029	-0.124
OH	31	65	142	-0.013	-0.037	-0.107
OK	0	48	49	0.000	-0.035	-0.043
OR	11	47	82	-0.004	-0.031	-0.082
PA	44	57	83	-0.035	-0.017	-0.068
RI	89	14	129	-0.073	-0.003	-0.078
SC	29	57	79	-0.021	-0.034	-0.079
SD	0	27	41	0.000	-0.004	-0.024
TN	14	54	76	-0.005	-0.026	-0.074
TX	0	41	36	0.000	-0.018	-0.033
UT	0	32	56	0.000	-0.013	-0.067
VA	32	34	75	-0.024	-0.014	-0.040
VT	36	33	75	-0.034	-0.013	-0.041
WA	0	44	65	0.000	-0.022	-0.058
WI	1	56	87	0.000	-0.023	-0.058
WV	12	44	41	-0.005	-0.015	-0.026
WY	0	0	72	0.000	0.000	-0.055

Table 3 Manufacturing, Construction and Information Employment Shares of Total, Five Highest Highlighted

Employment Shares of 50 States, Top 5 Are Highlighted

	Manufacturing Shares			Construction Shares			Information Shares		
	1990	2000	2006	1990	2000	2006	1990	2000	2006
AK	0.060	0.042	0.042	0.042	0.050	0.059	0.023	0.026	0.022
AL	0.221	0.181	0.152	0.052	0.054	0.055	0.018	0.017	0.014
AR	0.238	0.208	0.167	0.041	0.046	0.047	0.019	0.018	0.016
AZ	0.119	0.094	0.071	0.057	0.075	0.091	0.022	0.024	0.017
CA	0.157	0.127	0.097	0.051	0.050	0.061	0.031	0.040	0.030
CO	0.112	0.085	0.065	0.042	0.074	0.074	0.034	0.049	0.033
CT	0.184	0.138	0.113	0.039	0.038	0.040	0.026	0.027	0.023
DE	0.132	0.099	0.077	0.017	0.014	0.018	0.014	0.019	0.015
FL	0.095	0.068	0.052	0.072	0.069	0.085	0.024	0.026	0.020
GA	0.172	0.134	0.108	0.049	0.052	0.053	0.028	0.036	0.026
HI	0.039	0.030	0.025	0.022	0.013	0.020	0.019	0.022	0.018
IA	0.179	0.170	0.154	0.037	0.043	0.050	0.024	0.027	0.022
ID	0.137	0.126	0.104	0.049	0.065	0.081	0.020	0.017	0.017
IL	0.173	0.144	0.115	0.042	0.045	0.046	0.025	0.024	0.020
IN	0.240	0.221	0.189	0.046	0.050	0.050	0.018	0.015	0.013
KS	0.163	0.148	0.133	0.039	0.049	0.047	0.028	0.035	0.029
KY	0.187	0.171	0.142	0.045	0.048	0.045	0.018	0.018	0.015
LA	0.111	0.092	0.082	0.060	0.067	0.070	0.017	0.016	0.015
MA	0.161	0.120	0.091	0.033	0.039	0.043	0.029	0.033	0.027
MD	0.092	0.071	0.053	0.072	0.065	0.073	0.022	0.024	0.019
ME	0.174	0.132	0.098	0.054	0.048	0.051	0.019	0.020	0.018
MI	0.210	0.190	0.148	0.036	0.045	0.041	0.018	0.016	0.015
MN	0.160	0.148	0.125	0.036	0.044	0.046	0.025	0.026	0.021
MO	0.167	0.133	0.112	0.041	0.050	0.053	0.029	0.028	0.023
MS	0.245	0.193	0.154	0.040	0.047	0.050	0.014	0.015	0.012
MT	0.066	0.058	0.047	0.036	0.052	0.069	0.022	0.020	0.018
NC	0.264	0.194	0.137	0.054	0.059	0.061	0.016	0.019	0.018
ND	0.059	0.073	0.074	0.038	0.048	0.052	0.023	0.026	0.021
NE	0.133	0.125	0.107	0.038	0.048	0.050	0.030	0.030	0.021
NH	0.194	0.165	0.122	0.044	0.040	0.046	0.021	0.022	0.020
NJ	0.146	0.105	0.079	0.041	0.037	0.043	0.033	0.032	0.024
NM	0.066	0.056	0.045	0.055	0.060	0.071	0.018	0.022	0.019
NV	0.039	0.042	0.039	0.080	0.087	0.112	0.018	0.019	0.012
NY	0.120	0.087	0.066	0.039	0.038	0.039	0.035	0.037	0.032
OH	0.217	0.182	0.147	0.039	0.044	0.042	0.021	0.019	0.016
OK	0.134	0.124	0.100	0.034	0.041	0.045	0.019	0.024	0.019
OR	0.163	0.139	0.122	0.043	0.052	0.059	0.022	0.024	0.020
PA	0.184	0.152	0.117	0.044	0.044	0.045	0.021	0.024	0.019
RI	0.208	0.149	0.106	0.040	0.038	0.046	0.022	0.023	0.020
SC	0.228	0.181	0.132	0.062	0.062	0.066	0.015	0.016	0.014
SD	0.116	0.116	0.104	0.044	0.049	0.055	0.019	0.018	0.017
TN	0.227	0.181	0.143	0.043	0.046	0.047	0.020	0.020	0.018
TX	0.133	0.113	0.092	0.049	0.060	0.060	0.025	0.029	0.022
UT	0.143	0.117	0.103	0.039	0.067	0.079	0.020	0.033	0.027
VA	0.134	0.103	0.077	0.063	0.060	0.067	0.026	0.034	0.025
VT	0.166	0.155	0.118	0.056	0.050	0.056	0.021	0.023	0.020
WA	0.157	0.121	0.099	0.054	0.059	0.067	0.023	0.036	0.034
WI	0.229	0.210	0.178	0.038	0.044	0.045	0.019	0.019	0.017
WV	0.134	0.108	0.084	0.046	0.048	0.054	0.020	0.020	0.016
WY	0.046	0.044	0.037	0.063	0.077	0.086	0.018	0.017	0.015

Table 4 50 State Shares of Construction, Manufacturing and Information Jobs

	Construction Share			Manufacturing Share			Information Share		
	1990	1990-2000	2000-2006	1990	1990-2000	2000-2006	1990	1990-2000	2000-2006
Mean	4.59%	0.51%	0.53%	15.26%	-2.54%	-2.44%	2.22%	0.23%	-0.45%
Median	4.32%	0.46%	0.40%	15.86%	-2.63%	-2.33%	2.12%	0.15%	-0.42%
Maximum	8.01%	3.22%	2.47%	26.43%	1.41%	0.14%	3.50%	1.47%	-0.06%
Minimum	1.69%	-0.92%	-0.36%	3.90%	-7.01%	-5.69%	1.39%	-0.25%	-1.59%
Std. Dev.	1.2%	0.8%	0.6%	5.8%	1.6%	1.3%	0.5%	0.4%	0.3%

Table 5 Summary Stats, Dependent Variables

	-DEPTH1	-DEPTH2	-DEPTH3	LENGTH1	LENGTH2	LENGTH3
Mean	0.016	0.019	0.067	22.8	40.34	80.82
Median	0.005	0.018	0.059	11.5	45	79.5
Max	0.073	0.058	0.224	93.0	70	142
Min	0.000	0.000	0.002	0.0	0	11
Max-min	0.073	0.058	0.222	93.0	70.0	131.0

Table 6 Regressions for Episode 2: 2000s

Method: Least Squares					**Method: Least Squares, Trimmed, Standardized Variables**				
Dependent Variable: LENGTH_2					**Dependent Variable: LENGTH_2**				
Variable	Coeff	Std. Err.	t-Stat	Prob.	Variable	Coeff	Std. Err.	t-Stat	Prob.
C	-13	14	-0.9	0.35	C	-0.58	0.63	-0.9	0.36
CONS_SHARE_2000	55	242	0.2	0.82	CONS_SHARE_1990	-0.16	0.09	-1.8	0.071
CONS_SHARE_1990	-322	277	-1.2	0.25	**(MFG_SHARE_2000+MFG_SHARE_1990)/2**	**0.79**	0.09	**9.1**	0.00
MFG_SHARE_2000	170	161	1.1	0.30	(INFO_SHARE_2000+INFO_SHARE_1990)/2	0.26	0.09	3.1	0.00
MFG_SHARE_1990	144	132	1.1	0.28					
INFO_SHARE_2000	357	517	0.7	0.49					
INFO_SHARE_1990	596	707	0.8	0.40					
R-squared	0.69	Mean dependent var		40.34	R-squared	0.62	Mean dependent var		1.96
Adjusted R-squared	0.64	S.D. dependent var		20.61	Adjusted R-squared	0.60	S.D. dependent var		1.00
S.E. of regression	12.35				S.E. of regression	0.58			
Dependent Variable: -DEPTH_2					**Dependent Variable: -DEPTH_2**				
Variable	Coeff	Std. Err.	t-Stat	Prob.	Variable	Coeff	Std. Err.	t-Stat	Prob.
C	-0.01	0.01	-0.5	0.63	C	-0.23	0.85	-0.3	0.78
CONS_SHARE_2000	0.18	0.21	0.9	0.39	CONS_SHARE_1990	-0.19	0.11	-1.6	0.11
CONS_SHARE_1990	-0.38	0.24	-1.6	0.12	**MFG_SHARE_1990**	**0.61**	0.12	**5.3**	0.00
MFG_SHARE_2000	0.03	0.14	0.2	0.84	INFO_SHARE_2000-INFO_SHARE_1990	0.18	0.12	1.5	0.13
MFG_SHARE_1990	0.13	0.12	1.1	0.27	INFO_SHARE_1990	0.14	0.12	1.1	0.26
INFO_SHARE_2000	0.57	0.46	1.2	0.22					
INFO_SHARE_1990	-0.18	0.63	-0.3	0.78					
R-squared	0.47	Mean dependent var		0.02	R-squared	0.45	Mean dependent var		1.36
Adjusted R-squared	0.39	S.D. dependent var		0.01	Adjusted R-squared	0.40	S.D. dependent var		1.00
S.E. of regression	0.01				S.E. of regression	0.77			
Dependent Variable: -DEPTH_2*LENGTH_2					**Dependent Variable: -DEPTH_2*LENGTH_2**				
Variable	Coeff	Std. Err.	t-Stat	Prob.	Variable	Coeff	Std. Err.	t-Stat	Prob.
C	-0.69	0.81	-0.8	0.40	C	-0.74	0.82	-0.9	0.37
CONS_SHARE_2000	16.31	13.85	1.2	0.25	CONS_SHARE_2000-CONS_SHARE_1990	0.14	0.11	1.2	0.22
CONS_SHARE_1990	-27.99	15.84	-1.8	0.08	CONS_SHARE_1990	-0.15	0.11	-1.4	0.18
MFG_SHARE_2000	-0.30	9.20	0.0	0.97	**MFG_SHARE_1990**	**0.63**	0.12	**5.5**	0.00
MFG_SHARE_1990	10.12	7.58	1.3	0.19	(INFO_SHARE_2000+INFO_SHARE_1990)/2	0.18	0.11	1.5	0.13
INFO_SHARE_2000	9.41	29.62	0.3	0.75					
INFO_SHARE_1990	18.40	40.52	0.5	0.65					
R-squared	0.46	Mean dependent var		1.01	R-squared	0.46	Mean dependent var		1.12
Adjusted R-squared	0.38	S.D. dependent var		0.90	Adjusted R-squared	0.41	S.D. dependent var		1.00
S.E. of regression	0.71				S.E. of regression	0.77			

Table 7 Regressions for Episode 3: The Great Recession

Method: Least Squares

Dependent Variable: LENGTH_3

Variable	Coeff	Std. Err.	t-Stat	Prob.
C	61	32	1.9	0.06
CONS_SHARE_2006	1215	921	1.3	0.19
CONS_SHARE_2000	-1580	1139	-1.4	0.17
CONS_SHARE_1990	333	605	0.6	0.58
MFG_SHARE_2006	135	718	0.2	0.85
MFG_SHARE_2000	-846	911	-0.9	0.36
MFG_SHARE_1990	881	367	2.4	0.02
INFO_SHARE_2006	-3799	2340	-1.6	0.11
INFO_SHARE_2000	798	2036	0.4	0.70
INFO_SHARE_1990	1437	1486	1.0	0.34

R-squared	0.31	Mean dependent var	80.82
Adjusted R-squared	0.22	S.D. dependent var	30.20
S.E. of regression	26.74		

Dependent Variable: -DEPTH_3

Variable	Coeff	Std. Err.	t-Stat	Prob.
C	0.00	0.04	0.03	0.97
CONS_SHARE_2006	2.65	1.28	2.1	0.05
CONS_SHARE_2000	-2.17	1.59	-1.4	0.18
CONS_SHARE_1990	0.02	0.84	0.0	0.98
MFG_SHARE_2006	-0.88	1.00	-0.9	0.38
MFG_SHARE_2000	0.54	1.27	0.4	0.67
MFG_SHARE_1990	0.41	0.51	0.8	0.43
INFO_SHARE_2006	-4.04	3.26	-1.2	0.22
INFO_SHARE_2000	1.81	2.83	0.6	0.53
INFO_SHARE_1990	1.00	2.07	0.5	0.63

R-squared	0.31	Mean dependent var	0.07
Adjusted R-squared	0.16	S.D. dependent var	0.04
S.E. of regression	0.04		

Dependent Variable: -DEPTH_3*LENGTH_3

Variable	Coeff	Std. Err.	t-Stat	Prob.
C	1.61	5.27	0.3	0.76
CONS_SHARE_2006	271.69	151.02	1.8	0.08
CONS_SHARE_2000	-233.75	186.83	-1.3	0.22
CONS_SHARE_1990	5.80	99.24	0.1	0.95
MFG_SHARE_2006	-61.19	117.69	-0.5	0.61
MFG_SHARE_2000	9.49	149.35	0.1	0.95
MFG_SHARE_1990	65.72	60.21	1.1	0.28
INFO_SHARE_2006	-663.19	383.81	-1.7	0.09
INFO_SHARE_2000	218.45	333.82	0.7	0.52
INFO_SHARE_1990	167.24	243.75	0.7	0.50

R-squared	0.24	Mean dependent var	5.99
Adjusted R-squared	0.13	S.D. dependent var	4.66
S.E. of regression	4.35	Akaike info criterion	5.91

Method: Least Squares, Trimmed, Standardized Variables

Dependent Variable: LENGTH_3

Variable	Coeff	Std. Err.	t-Stat	Prob.
C	2.91	0.55	5.3	0.00
MFG_SHARE_2000-MFG_SHARE_1990	**-0.52**	0.12	**-4.4**	0.00
INFO_SHARE_2006-INFO_SHARE_1990	-0.35	0.12	-2.8	0.01
INFO_SHARE_1990	-0.29	0.12	-2.4	0.02

R-squared	0.37	Mean dependent var	2.68
Adjusted R-squared	0.33	S.D. dependent var	1.00
S.E. of regression	0.82		

Dependent Variable: -DEPTH_3

Variable	Coeff	Std. Err.	t-Stat	Prob.
C	1.27	0.62	2.1	0.05
CONS_SHARE_2006-CONS_SHARE_2000	0.40	0.14	2.9	0.01
MFG_SHARE_2006-MFG_SHARE_1990	**-0.45**	0.14	**-3.3**	0.00
INFO_SHARE_2006-INFO_SHARE_2000	-0.35	0.22	-1.5	0.13
INFO_SHARE_2000	-0.39	0.22	-1.7	0.09

R-squared	0.28	Mean dependent var	1.72
Adjusted R-squared	0.21	S.D. dependent var	1.00
S.E. of regression	0.89		

Dependent Variable: -DEPTH_3*LENGTH_3

Variable	Coeff	Std. Err.	t-Stat	Prob.
C	1.52	0.60	2.5	0.02
CONS_SHARE_2006-CONS_SHARE_2000	0.31	0.13	2.3	0.02
MFG_SHARE_2006-MFG_SHARE_1990	-0.43	0.13	**-3.2**	0.00
INFO_SHARE_2006-INFO_SHARE_2000	-0.44	0.22	-2.0	0.05
INFO_SHARE_2000	**-0.60**	0.22	-2.8	0.01

R-squared	0.31	Mean dependent var	1.29
Adjusted R-squared	0.25	S.D. dependent var	1.00
S.E. of regression	0.87		

Figures

Figure 1 A sustained increase in the unemployment rate could define the US recessions

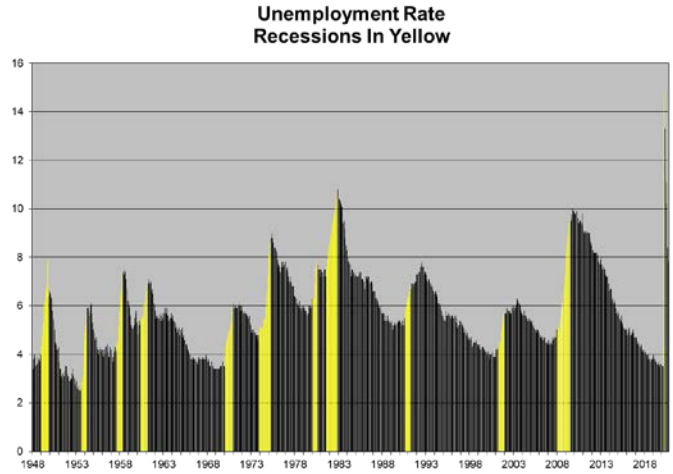

Figure 2 Total Payrolls from Peak to Recovery

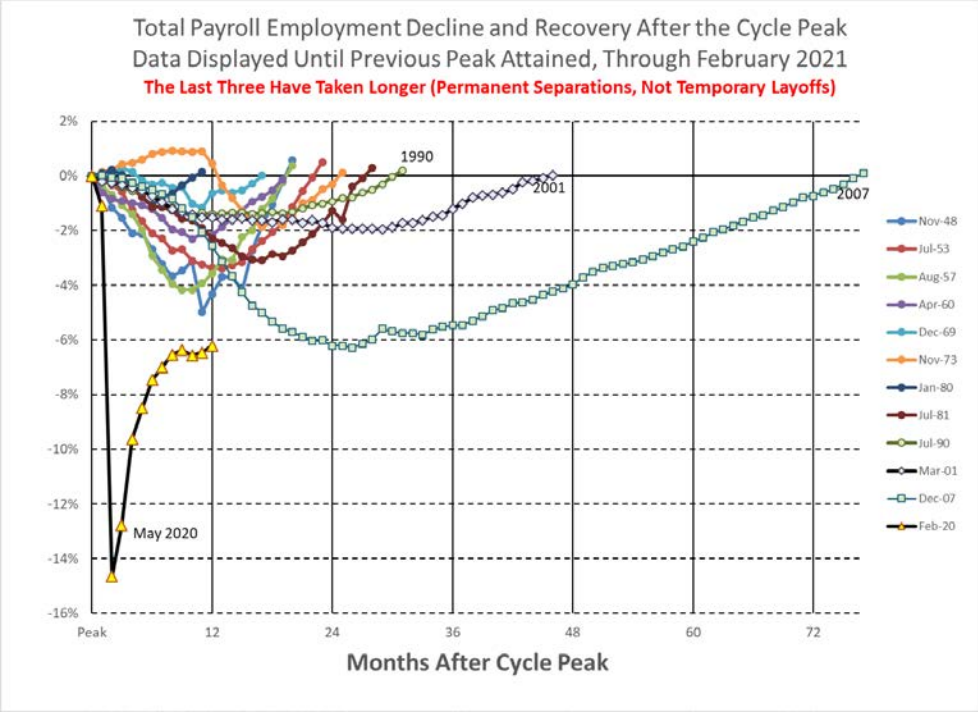

Figure 3 Real GDP Peak to Jobs Recovery

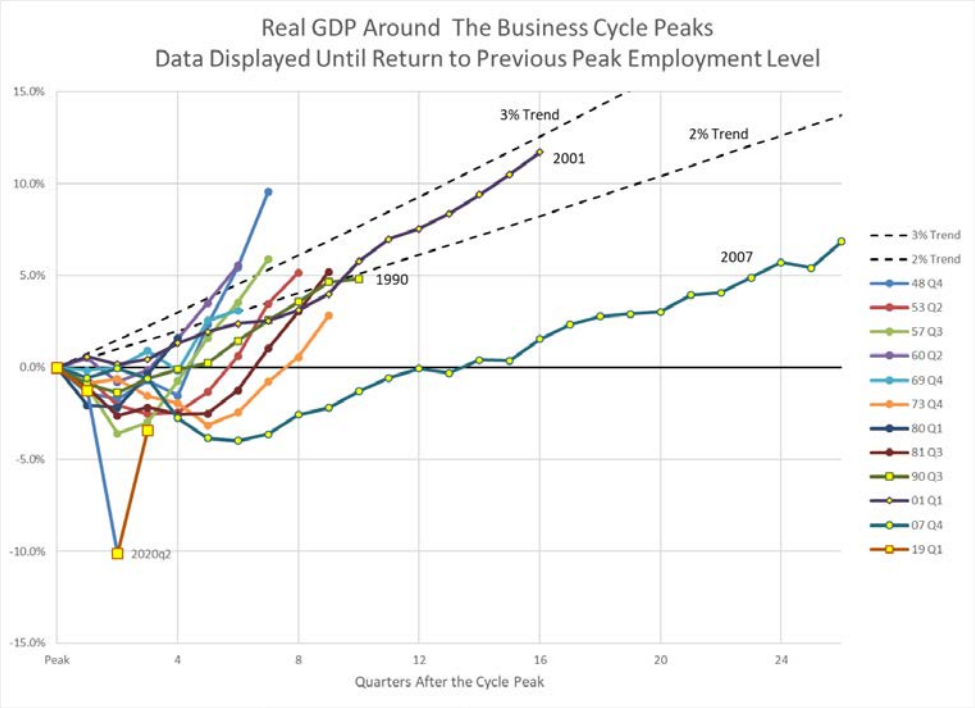

Figure 4 Increase in Unemployment, Peak to Jobs Recovery

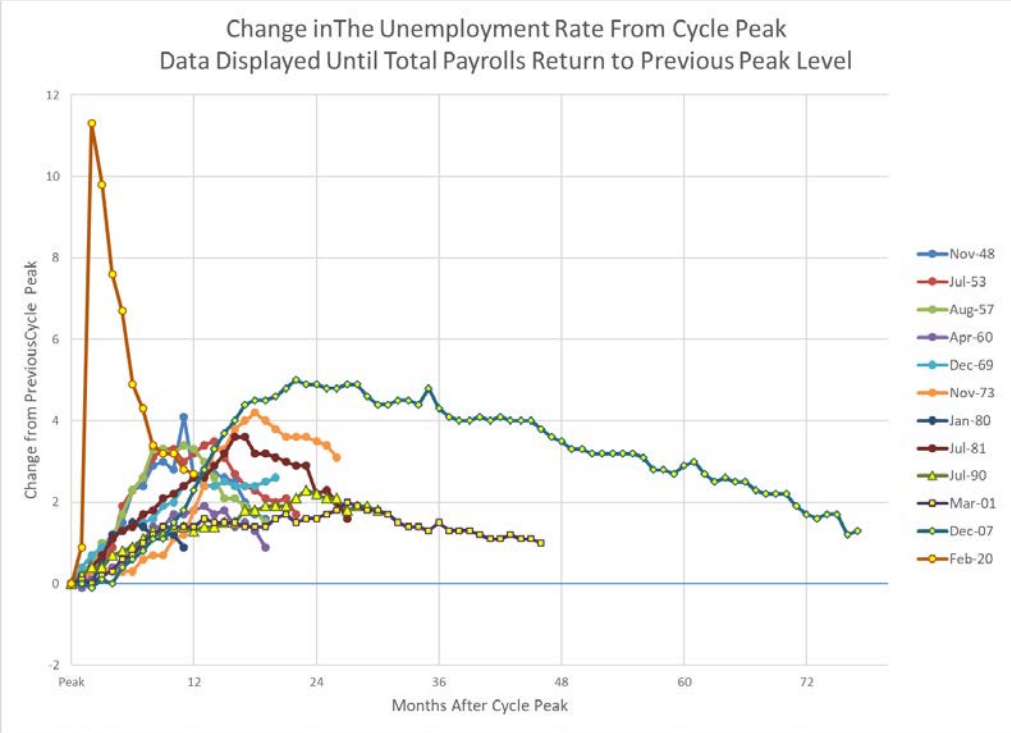

Figure 5 Lengths of recessions and recoveries

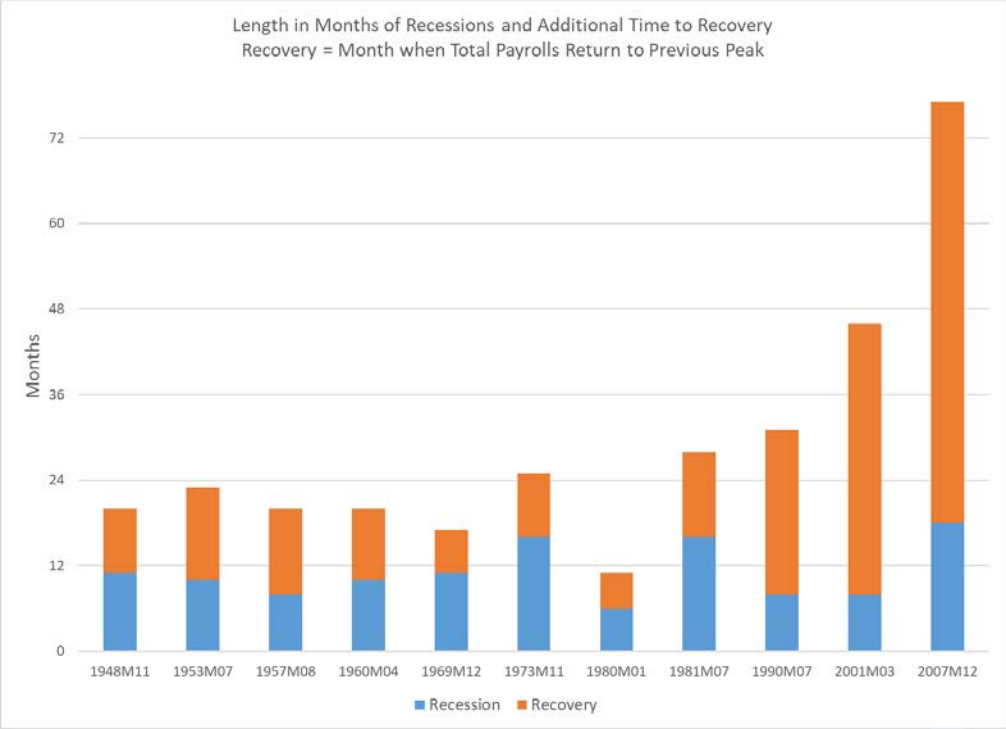

Figure 6 Sectoral Employment Changes

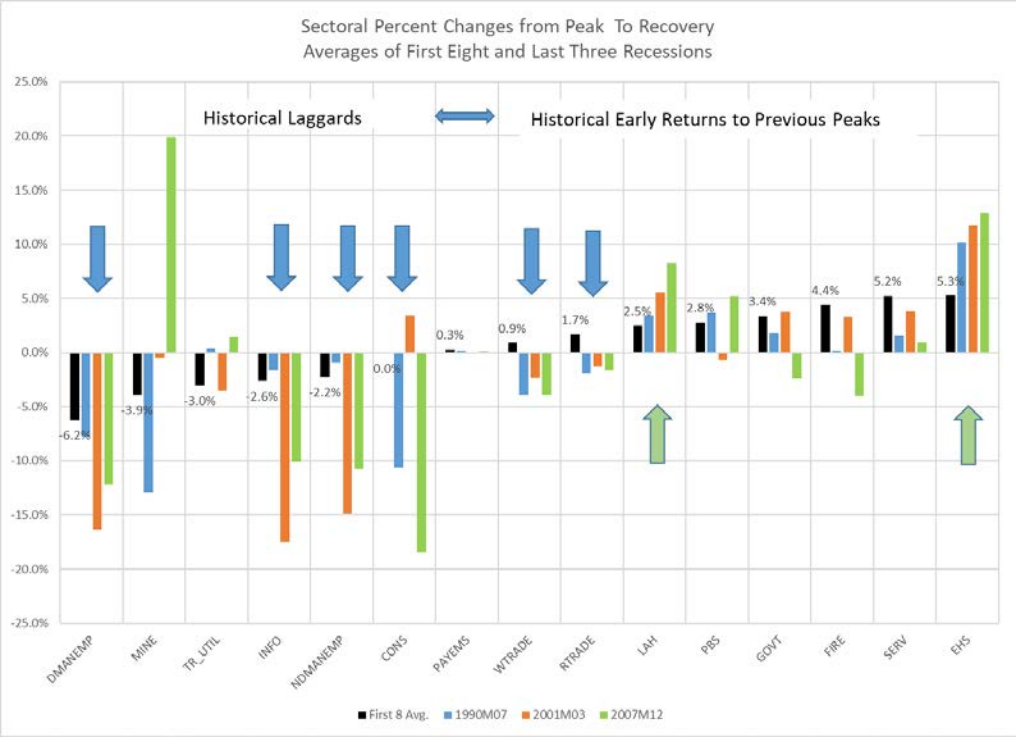

Figure 7 Manufacturing Payrolls

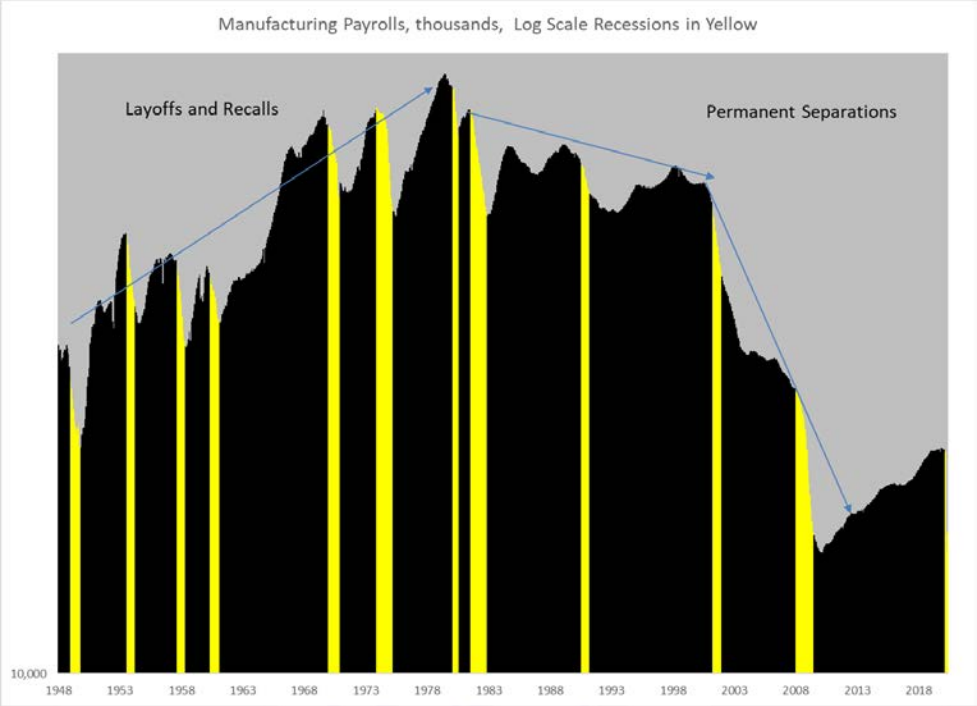

Figure 8 How the Trend Matters

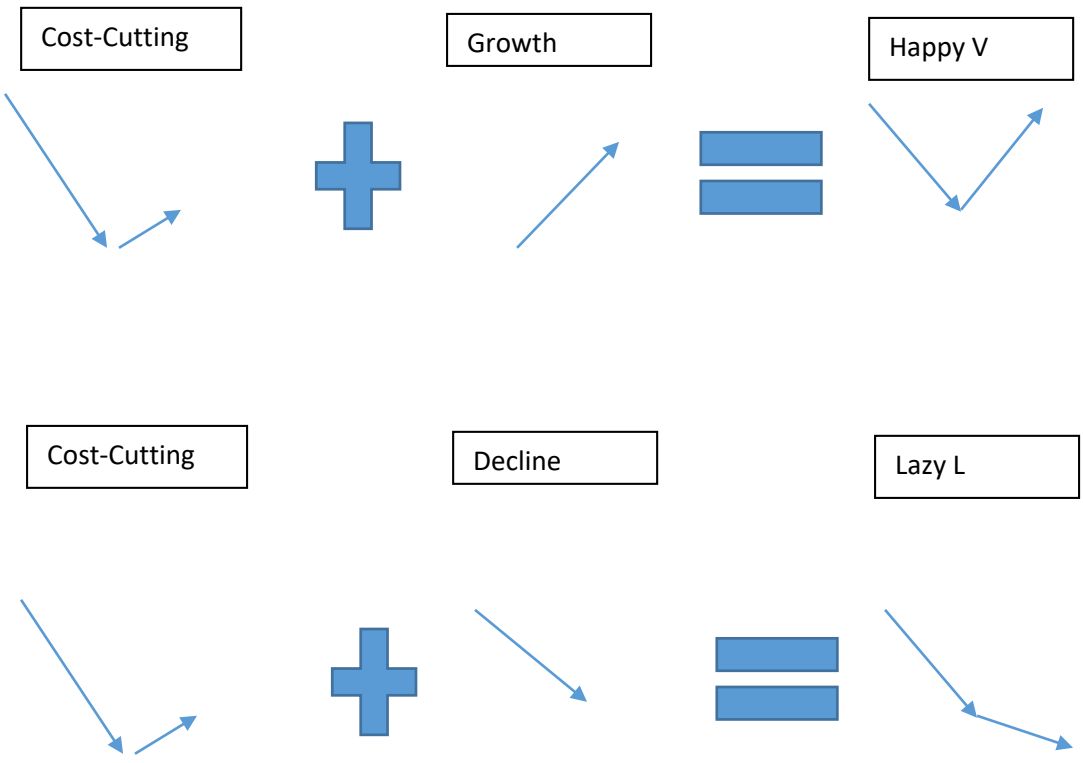

Figure 9 Manufacturing Jobs After the Cycle Peaks

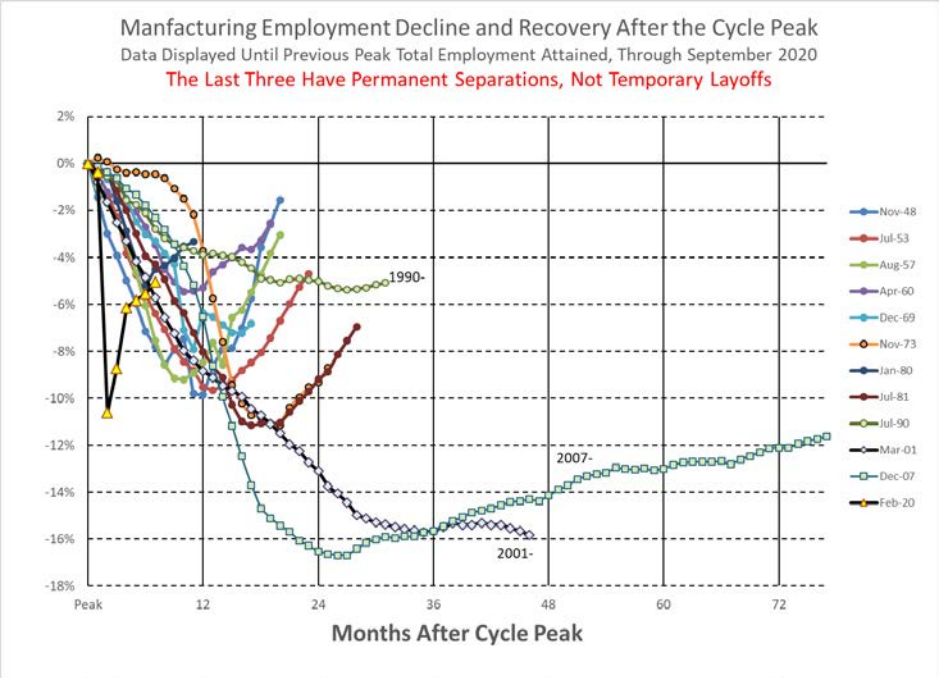

Figure 10 Construction Jobs

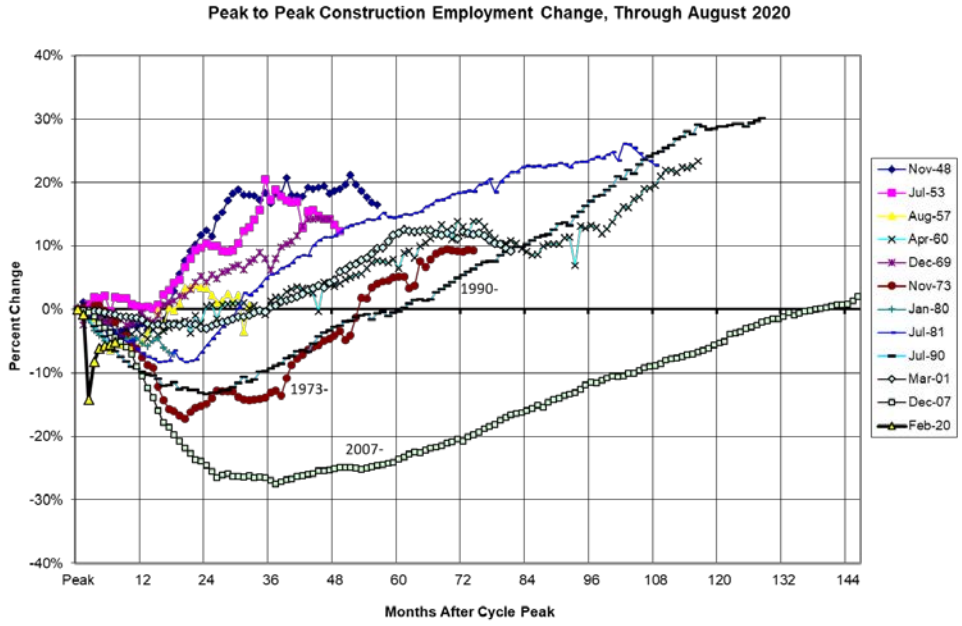

Figure 11 Information Jobs

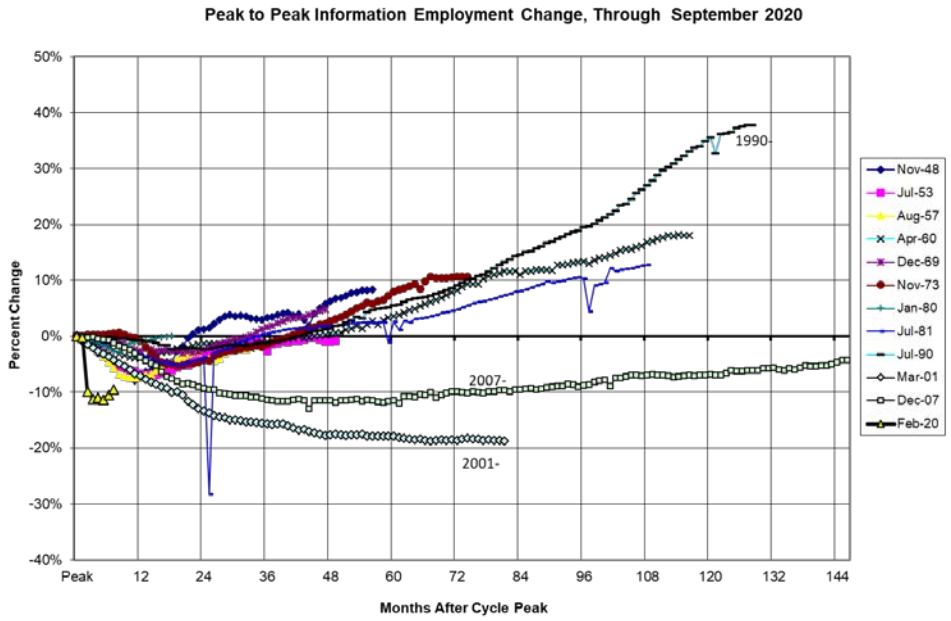

Figure 12 Information Subsectors

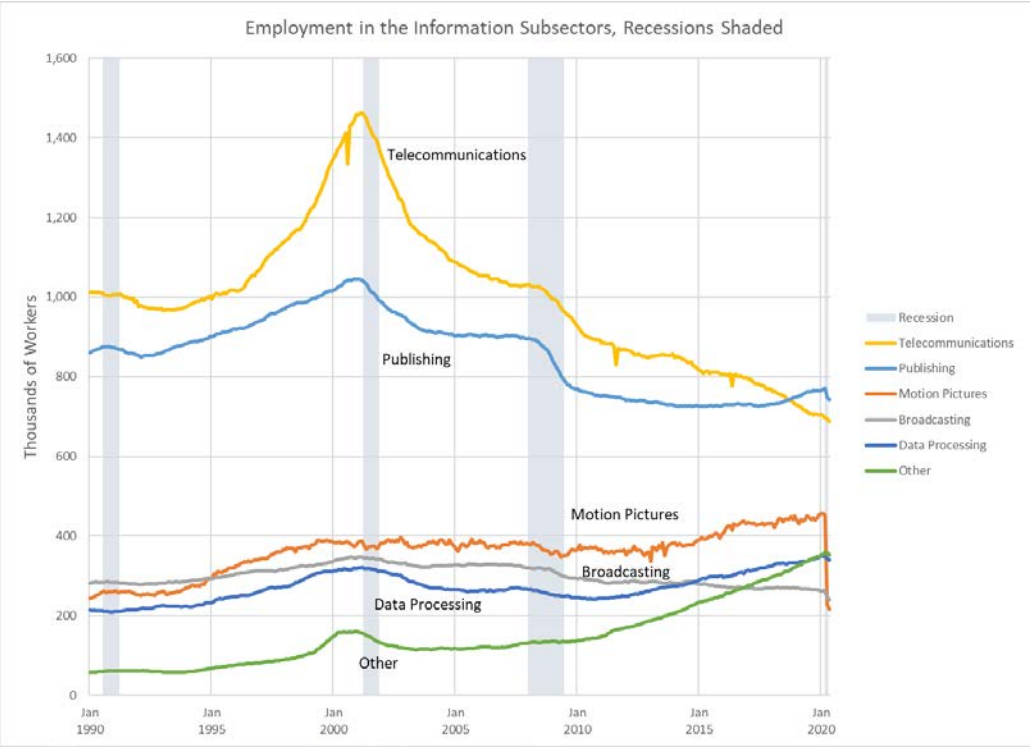

Figure 13 Wholesale Jobs

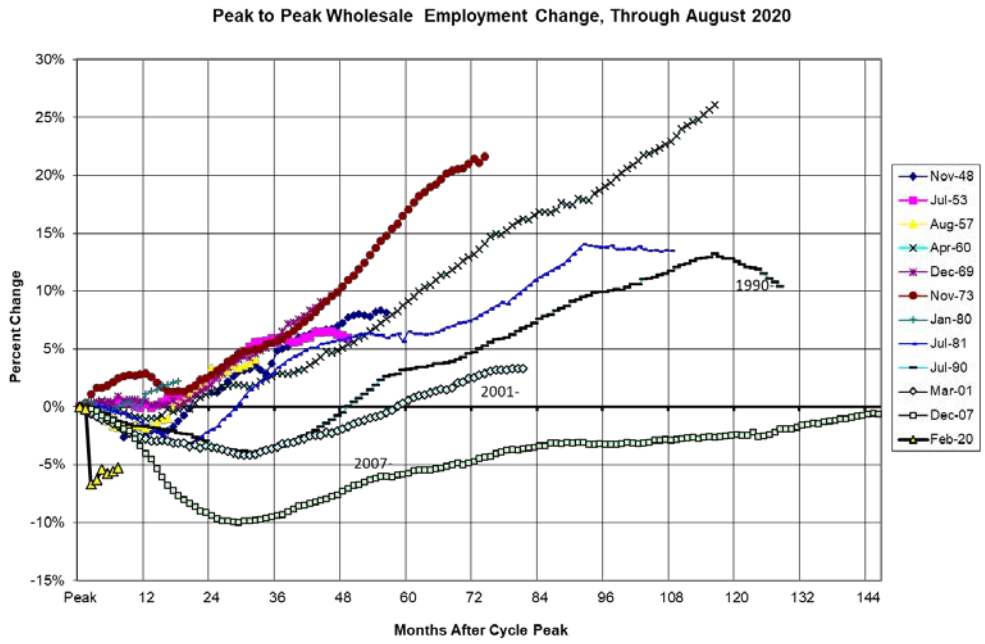

Figure 14 Retail Jobs

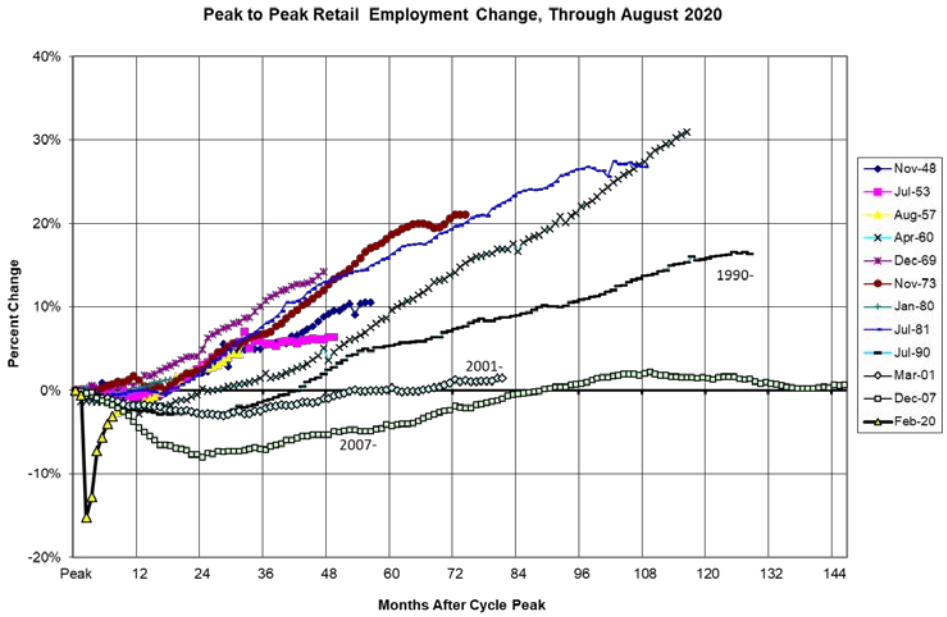

Figure 15 Seasonally Adjusted Data, 50 US States, US official recessions Shaded

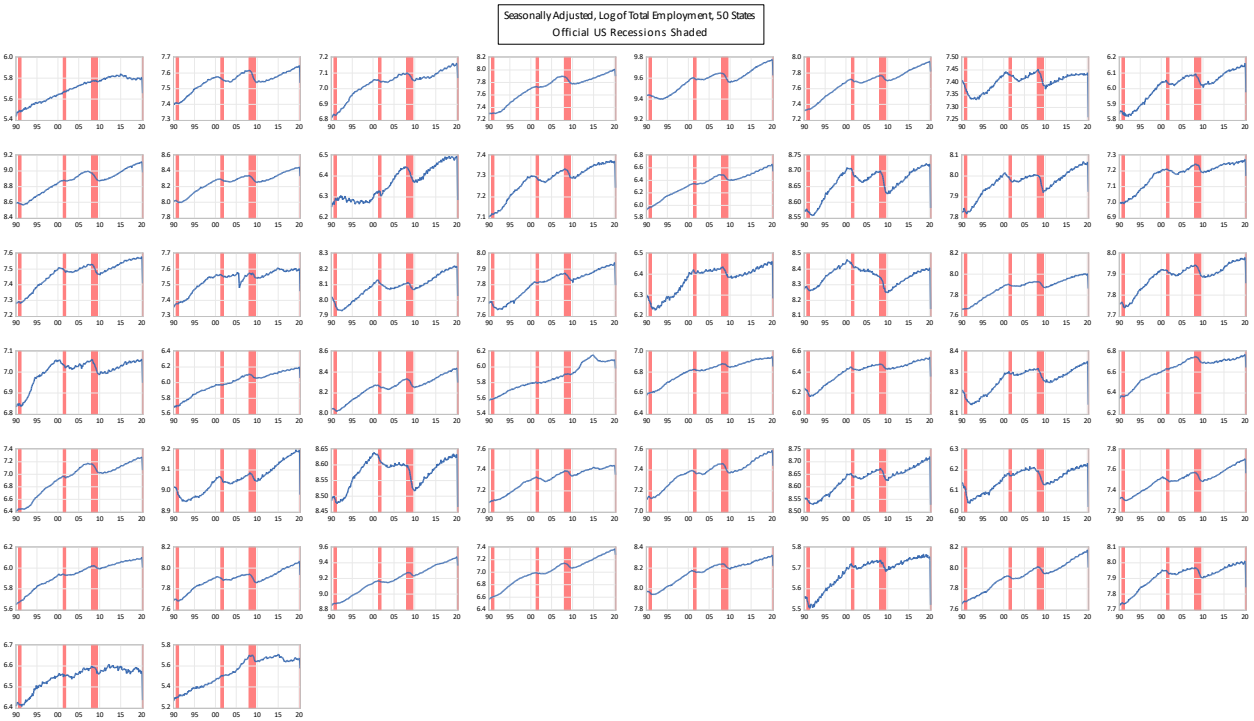

Figure 16 Identification of California Recession/Recovery Periods: Periods Below The Previous Peak

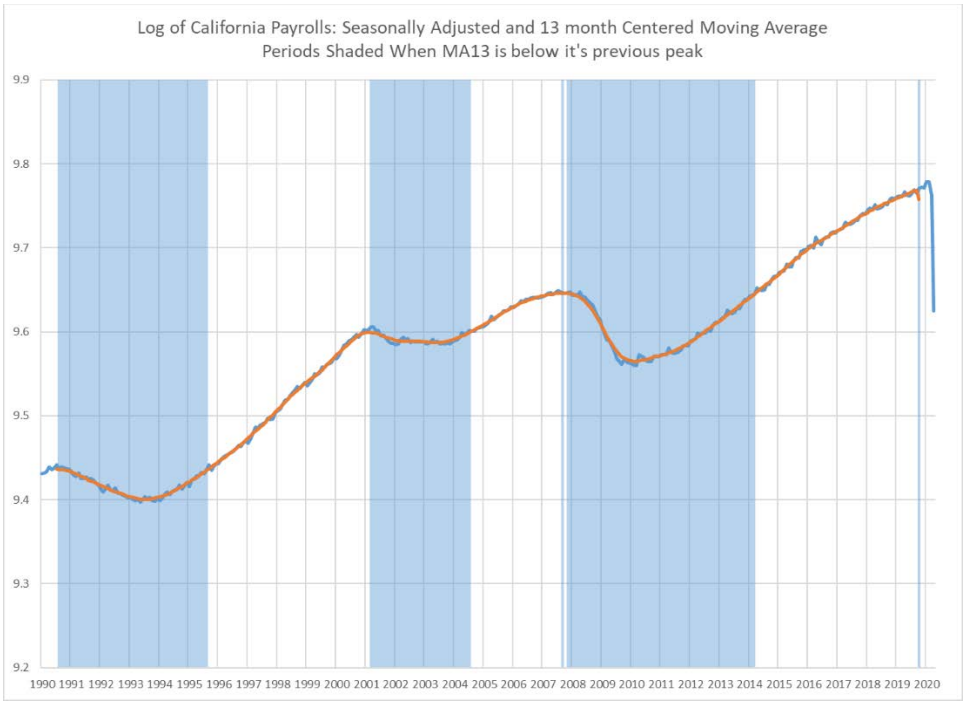

Figure 17 *AK periods During which the Centered Moving Average was Below the Previous Peak*

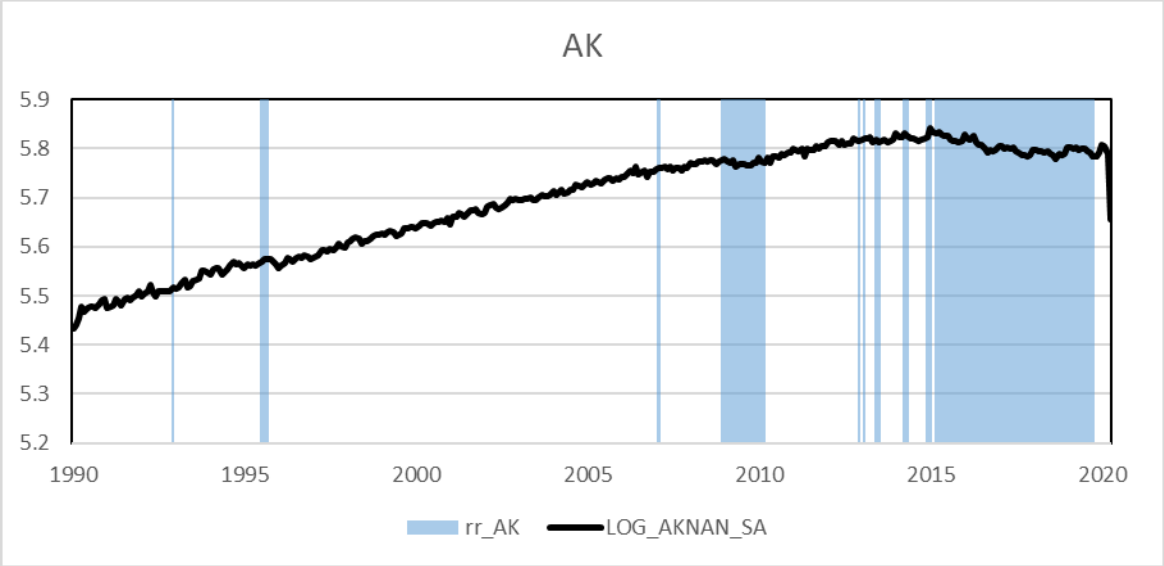

Figure 18 *Corrected Three Recessions Image*

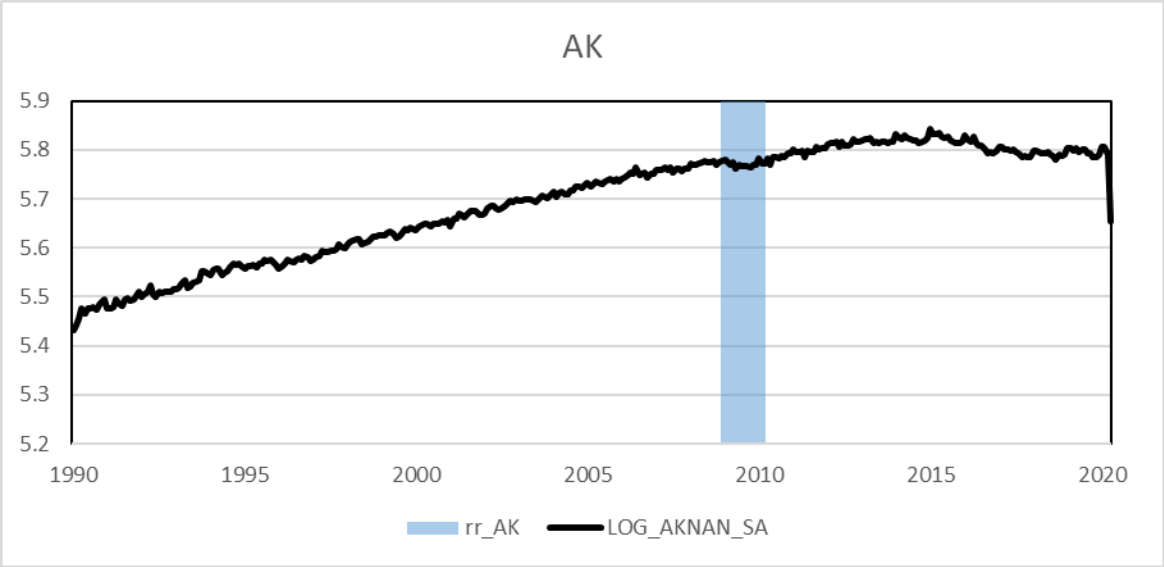

Figure 19 US Manufacturing, Construction and Information Shares