<u>Labor Market Overview: Future Trends and Structure of Surveys</u>

By: Vihaan Narvekar

Advised by Dr. Jeffrey Meli

This report will detail an overview of the CES (Current Employment Survey), CPS (Current Population Survey), and JOLTs (Job Openings and Labor Turnover), and CPS (Current Population Survey) surveys, which are issued by the Bureau of Labor Statistics.

Overview

Current Employment Survey

The Current Employment Statistics (CES) survey, conducted monthly by the Bureau of Labor Statistics, is a leading indicator of the U.S. labor market, measuring employment on payrolls, hours worked, and average earnings for nonfarm establishments. The survey uses a stratified, random sample of worksites from the state Unemployment Insurance records with sampling criteria defined by state, industry, and firm size.

1. **What is the CES (Design, Coverage, Metrics)**

The CES sample covers roughly ⅓ of all non-farm payroll employment, including 121,000 businesses and government agencies, representing 631,000 worksites. Specifically, the CES produces 3 main outputs: (1) the number of jobs on employer payrolls; (2) the average hourly earnings of workers paid during the period (gross payroll divided by hours worked); (3) the average weekly hours worked. All these metrics can be broken down by industry and geography. These measures are impactful because they are the timeliest indicators for labor demand, wage pressure, and labor utilization. Employers' changing payrolls show a shift in demand, rising average hourly earnings imply wage inflation, and changes in hours worked may show changes in the business cycle.

However, the CES has several flaws, especially considering the frequency and magnitude of the revisions. Officially, the month-to-month revisions are to be a result of sampling errors, additional responses, and seasonality. One major factor is that the sample frame cannot immediately capture newly created businesses or recently-closed ones; the BLS incorporates a 'birth-death' model to estimate the net effect of openings and closings after the initial release. Furthermore, each year the CES is benchmarked against the Quarterly Census of Employment and Wages (QCEW) dataset from UI records. The CES captures dynamics that are the foundation for consumer spending, inflation, and the policy environment. Understanding the design and outputs of the CES will help us to interpret the signals and have a broader macroeconomic perspective.

2. Methodology and Other Technical Notes

Seasonal Adjustment

Because many industries and employers follow regular seasonal patterns (e.g., retail stores, school-year, construction, etc.), the raw payroll numbers contain predictable seasonal swings. To help predict the cyclical and/or structural trends, the CES uses the X-13ARIMA-SEATS procedure (BLS). It is a concurrent adjustment method, meaning that each month the seasonal factors are updated as the new data arrives, and the series is revised to reflect the new information. This is important because industries with strong seasonal swings, as the timing of hiring and layoffs, can vary week-to-week, and how the pay period is set up.

Benchmarking to QCEW

Once a year (typically in February or March), the CES levels are benchmarked to the QCEW data. This resets the same-based CES estimates to a more complete employment universe. Practically, the Feb/March CES employment level is replaced with the Feb/March QCEW level. Then, the month-to-month changes from the sample are applied forward from that revised base for the following months until the next benchmark (BLS).

Birth – Death Model

The BLS created a 2-step net birth-death model to help account for the jobs created by new business openings and lost when the existing businesses close.

- **Step 1:** The sample excludes employment losses from business deaths in a matched-sample part. By doing this, the estimation is able to attribute some of the missing 'birth' employment from new businesses via the continuing units' growth.
- **Step 2:** Any residual birth-deaths (that remain after step 1) are estimated using an ARIMA (autoregressive integrated moving average) time-series model that uses past patterns from the QCEW dataset about births and deaths.

A recent example shows that the BLS reported that from April 2023 to March 2024, the net birth-death model forecasted 1,365,000 jobs for the private sector. The actual count was 1,109,000, indicating that the forecast overestimated by ~256,000 jobs. Since the ARIMA is based on historical patterns, it can perform poorly in periods of structural change or when business formation/closing accelerates. Additionally, BLS research shows that the model's assumptions 'broke' during COVID-19 and required modifications.

The model is unobserved in real time (only corrected later when revising), indicating that during business cycle transitions, we may see some larger revisions. The monthly revisions are typically inconsequential in the grand scheme of things, but the widening change during the yearly adjustment with the QCEW introduces worries as to why this is happening, as well as why academics and practitioners are not investigating it closely.

Why does this matter

While the CES provides early monthly estimates, the reliance on responses, seasonality, and different model assumptions means that readers of the data will have to take that into account **before** reading the provisional data. Additionally, we have to consider the usability of the data as well. As mentioned before, using an ARIMA model has its limitations, making it particularly difficult to interpret in times of structural change, and in turn, *includes the most noise when the data is the most important* (during economic turning points).

Current Population Survey

Released in the Current Population Survey (CPS), unemployment and labor force participation rate (LFPR) are two of the most fundamental measures to assess the health of an economy and its labor market. They describe how effectively an economy utilizes human resources and how engaged its population is in productive activity. However, analyzing only one of these indicators without considering the other can lead to misleading conclusions. For instance, on the surface level, a decline in the unemployment rate may appear to signal a strong labor market. However, if it occurs in tandem with a declining LFPR, it may instead be a reflection of people leaving the labor force rather than finding jobs.

1. Key Metrics

The unemployment rate measures the share of the labor force that is not currently employed but is actively seeking work:

$$\text{Unemployment Rate} = \frac{\text{Number of Unemployed Individuals}}{\text{Labor Force}} \times 100$$

The LFPR measures the proportion of the working-age population that is engaged in the labor market, either by working or seeking work:

$$\text{Labor Force Participation Rate (LFPR)} = \frac{\text{Labor Force}}{\text{Total Working-Age Population}} \times 100$$

The labor force represents the number of people who are either employed or actively looking for work. Those who are not working or seeking employment (students, retirees, discouraged workers, etc.) are excluded from the labor force. The total working age population consists of individuals 16 and over who are not in active-duty military or institutions. Unemployed individuals refer to people who are looking for a job but are unable to find one. Thus, the unemployment rate reflects the proportion of people who want to work but cannot find jobs. The CPS, conducted monthly by the U.S. Census Bureau and the Bureau of Labor Statistics (BLS), is the primary source of labor statistics for the U.S. population. It collects data from a stratified sample of approximately 60,000 households through interviews, recording individuals' employment status, job search activities, and reasons for nonparticipation. Within this survey, the BLS publishes six measures of unemployment (labeled U1 – U6), which expand on the standard unemployment rate (U3).

Table 1: U1–U6 Alternative Measures of Labor Underutilization (BLS CPS)

Measure	**Description and Formula**
U1	Persons unemployed 15 weeks or longer, as a percentage of the labor force. $$U1 = \frac{\text{Unemployed 15+ Weeks}}{\text{Labor Force}} \times 100$$
U2	Job losers and persons who completed temporary jobs, as a percentage of the labor force. $$U2 = \frac{\text{Job Losers} + \text{Temporary Job Completers}}{\text{Labor Force}} \times 100$$
U3	Total unemployed, as a percentage of the labor force (the official unemployment rate). $$U3 = \frac{\text{Total Unemployed}}{\text{Labor Force}} \times 100$$
U4	Total unemployed plus discouraged workers, as a percentage of the labor force plus discouraged workers. $$U4 = \frac{\text{Unemployed} + \text{Discouraged Workers}}{\text{Labor Force} + \text{Discouraged Workers}} \times 100$$
U5	Total unemployed plus all marginally attached workers, as a percentage of the labor force plus all marginally attached workers. $$U5 = \frac{\text{Unemployed} + \text{Marginally Attached Workers}}{\text{Labor Force} + \text{Marginally Attached Workers}} \times 100$$
U6	Total unemployed, all marginally attached workers, and those employed part-time for economic reasons, as a percentage of the labor force plus all marginally attached workers. $$U6 = \frac{\text{Unemployed} + \text{Marginally Attached} + \text{Part-Time for Economic Reasons}}{\text{Labor Force} + \text{Marginally Attached Workers}} \times 100$$

2. Revisions

Since the CPS relies on survey sampling and not administrative records, the BLS periodically conducts revisions on population controls, seasonal adjustment factors, and survey methodology. The annual population control revision happens every January and adjusts CPS weights to match updated population estimates. These updates account for immigration revisions, death rate estimates, birth estimates, and updated demographic projections. This may shift the level of employment, unemployment, or the labor force, but the unemployment rate usually does not change that much since the numerator (unemployed) and denominator (labor force) are revised by roughly the same percentage. Seasonal adjustment revisions also happen every January, accounting for the evolution of retail hiring, school patterns, and holiday effects over time. Methodological revisions occur very infrequently, but can include redefining certain employment categories, changing how multi-job holders are counted, or survey design improvements.

Job Openings and Labor Turnover Survey

The Job Openings and Labor Turnover Survey (JOLTS) is one of the most-watched series for labor dynamics. Unlike the Current Employment Statistics (CES), which measures employment levels, JOLTS focuses on the flow of workers and openings in the labor market by measuring job openings, hires, quits, and separations. JOLTS data is used to understand the interaction between labor supply and demand to determine the ‘labor market tightness’. These metrics influence wage dynamics and inflation, causing the Federal Reserve to monitor the series when determining interest rates.

1. What is JOLTS (Design, Coverage, Key Metrics)

JOLTS is a monthly survey conducted by the Bureau of Labor Statistics that collects data about labor flow. The survey collects data from a stratified random sample of ~21,000 nonfarm business and government establishments. The entities are selected from a frame that includes data from the BLS’s Quarterly Census of Employment and Wages (QCEW), intended to cover 95% of total nonfarm payroll jobs in the United States.

The survey is conducted monthly across all businesses, with the data being released the month following collection. While the high frequency of data collection does allow for timely understanding, the delay implies that it is typically available after the CES’s payroll numbers. Thus, to keep the different series consistent, JOLTS employment figures are ratio-adjusted to CES employment levels once a year, typically either March or April. In addition to the main annual adjustment, there are seasonal adjustments that are used to account for fluctuations in cyclical industries or factors like holidays and weather. This is done monthly using an in-house concurrent adjustment method (X-13ARIMA-SEATS) that recalibrates seasonal factors monthly to help maintain standardization across seasons. This ultimately helps viewers to observe overarching trends within the labor market, regardless of seasonality.

Key Metrics

Job Openings: Represents the number of unfilled positions on the last business day of the month. Directly acts as an indicator for labor demand. (August 2025: 7.181M vacancies)

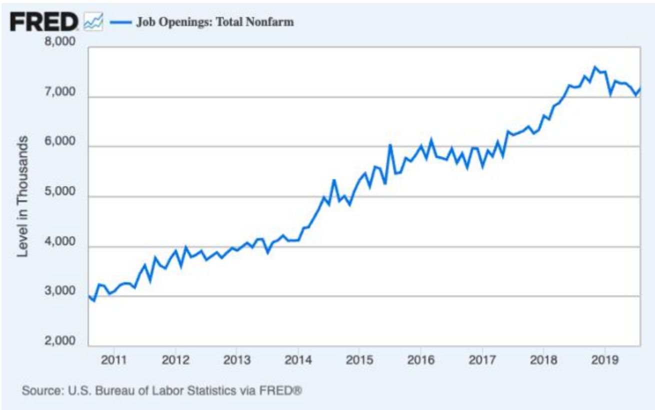
- Hires: The total number of additions to payrolls that month. A metric that reflects the pace at which employers are hiring/bringing on new employees. (August 2025: 5.1M new hires)
- Separations: Encompass a variety of different circumstances:
- Quits: Voluntary separations by the employee (August 2025: 3.1M voluntary separations)
- Layoffs and Discharges: Involuntary separations from the employer. (August 2025: 1.7M involuntary separations)
- Other Separations: This includes retirements, death, disability, or internal transfers (August 2025: 295,000 other separations)
- Market Tightness: Ratio of job openings to unemployed persons, helping show the balance between labor supply and demand.
- Separation/Hire Churn: The combined total of (hires – separations), indicating if it's a dynamic or stable labor market.

Trends

Historical Patterns in the JOLTS

To help introduce an understanding of what is ‘normal’ in terms of market dynamics, this section will look at labor dynamics during the period 2015-2019. From 2015 to 2019, job openings (total nonfarm) consistently grew between 6 and 7 million nationwide (FRED). Over that same period, the quit rate (voluntary separations as a percent of employment) hovered around 2.0% – 2.3%, showing a moderate and steady rate of mobility. Additionally, the ratio of unemployed persons to job openings was often around 1.0 (i.e., there is one job opening for each unemployed worker).

There are typical upturns and downturns during these years, such as openings would drift downwards during recessions, quits would decline (cautious workers), and layoffs would spike.



COVID-19 Disruption (2020)

The early introduction of the pandemic in 2020 had several effects on JOLTS:

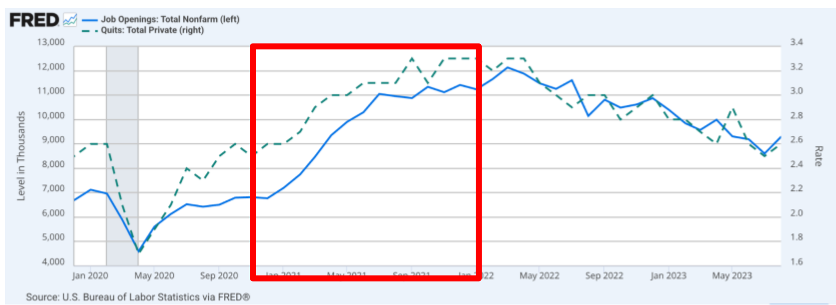
- Job Openings Plunged as firms halted hiring.
- Quits dropped sharply, as workers were uncertain about the current economy and were unlikely to voluntarily leave.
- Layoffs/Discharges rose, reflecting the mass firings, cost-cutting, and program reductions.

In April 2020, many of the JOLTS metrics had reached an all-time low as both labor supply and demand showed a reversal from the normal behavior, and a transition into a contractive/recessive state.

Post-Pandemic Surge (2021 – 2022)

Post April 2020, the initial shock of the pandemic had worn out, and the labor market rallied and was moving towards all-time high levels:

- Job openings are increasing, reaching a peak of 12.0M – 12.1M in March 2022.
- The quit rate also hit record levels: in March 2022, it neared 3.0% (compared to the 2% average) of people leaving their jobs that month.
- The ratio of unemployed to openings was well below 1 as well, implying fewer unemployed workers than open jobs (labor tightness).



Outside of just broad industry trends, sectoral trends in leisure, hospitality, and food service had extremely high turnover, labor shortages, and wage pressures as labor was becoming more demanding due to changing labor demand.

Cooling / Reversion to Mean (2022–2025)

In the years following the post-pandemic hiring surge, the labor market began to moderate towards more typical patterns. Job openings gradually decline from the high of ~12.0 M to about 7.3 M in July 2025. At the same time, worker mobility (quit rate) also drifted downwards to near the 2% range in August 2025 (compared to the 3% high). Most of the other measurable metrics have also shifted towards more pre-pandemic levels. From a macro perspective, these trends signal a labor market that is healthy, but less overheated.

Some other noteworthy observations include

- While job openings have declined from the peaks, they are still well above pre-pandemic levels (which were in the 6-7 M range).
- Layoffs and discharges are relatively low, around 1.1% of employment in the most recent months.

- The ratio of unemployment level to job openings is also lower than the long-term average of 1.2 (currently it is 1.01), indicating that we may be moving towards a tighter labor market as the norm.

The evolution of JOLTS data over the past decade illustrates not just cyclical demands in labor demand, but also a structural adjustment of how the U.S. labor market functions. The post-pandemic period has shown a labor force that is more adaptable and tight. The sustained low level of layoffs and steady participation rates point to a more stable market. From a policy standpoint, these data points serve as a forward-looking metric for wage dynamics, especially in today's economic climate, where the Federal Reserve is putting increased importance on labor dynamics.

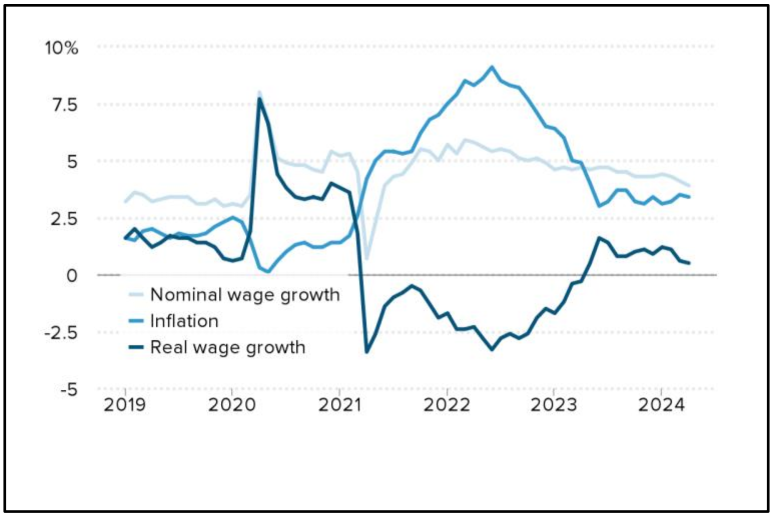
Headline Data and Immediate Interpretation (last 6 – 18 months)

Over the past 6 – 18 months, the U.S. labor market has moved from a strong, post-pandemic expansion towards a much lower-momentum trend. The CES's headline for August 2025 showed total nonfarm payroll employment rising by +22,000 and the unemployment rate increasing to 4.3% (compared to 4.2% in July 2025), as we see unemployment growing since the beginning of 2025. At the same time, average hourly private earnings rose by $0.10 (0.3%) to $36.53 in August (3.7% YoY increase), while average weekly hours were relatively steady.

Momentum and Trends

Looking at the month-to-month momentum shows how important a role revisions play in the process. June's initial gain was revised down and showed a net loss of 13,000 jobs. July and August were slightly revised up, but it leaves the 3-month and 6-month averages significantly lower than the 12-month average. In addition, the benchmark revision in March showed a -0.6% adjustment, one that is very large relative to the historical average of 0.2%.

In terms of wages and compensation, nominal wage growth is still positive at 3.7% YoY for average hourly earnings in August. However, real hourly earnings only grow 0.7% over the year, indicating that wages are changing at the same rate as current inflation growth. Average hours in private nonfarm were also relatively unchanged. This means that firms are not cutting hours or facing much difficulty, but the modest wage growth and flat real wage growth show limited pressure from labor cost inflation, helping limit one of the key drivers promoting inflation.



Real Wage Growth vs Inflation Growth 2019 – 2024

Revisions and Benchmarks

The annual benchmark adjustment to QCEW records trimmed about 911,000, as noted before, from April 2024 to March 2025, which is the largest preliminary adjustment on record. The revision lowers the implied average monthly job gain from 150,000 to 70,000, changing the overall narrative of labor market strength. This makes it very difficult to consider whether the data is useful pre-benchmark to make assumptions. Since the CES is based on an autoregressive regression model, in times of increased immigration, decreased survey response rates, and increased gig workers, the model is not able to accurately determine employment levels.

The true meaning behind the growing yearly revision has not been studied extensively, but I would venture to say that we may be undergoing a structural shift in the labor market. Increased immigration and a shift in part-time vs full-time employment have made the model deviate from the norm and caused the revisions to grow.

Relation to JOLTS

However, when comparing to other series, we are able to get a better understanding. From the JOLTS, the ratio of job openings to unemployed persons is approaching 1.0, indicating a market that is slightly less tight. Additionally, unemployment claims are modest and relatively constant. This corroborates the CES showing that the labor market is slightly softening and showing a cooling of labor demand.

Additionally, the JOLTS also notes weekly initial jobless claims as relatively stable, at around 218,000 in September, and we see that continued claims are also relatively low, implying that layoffs are reasonably contained. This depicts an environment where firms are no longer in a mode of hiring and are currently just maintaining their workforce. Employers still have a large number of openings, but the rate for these openings is settling towards a cooler, less demand-heavy market.

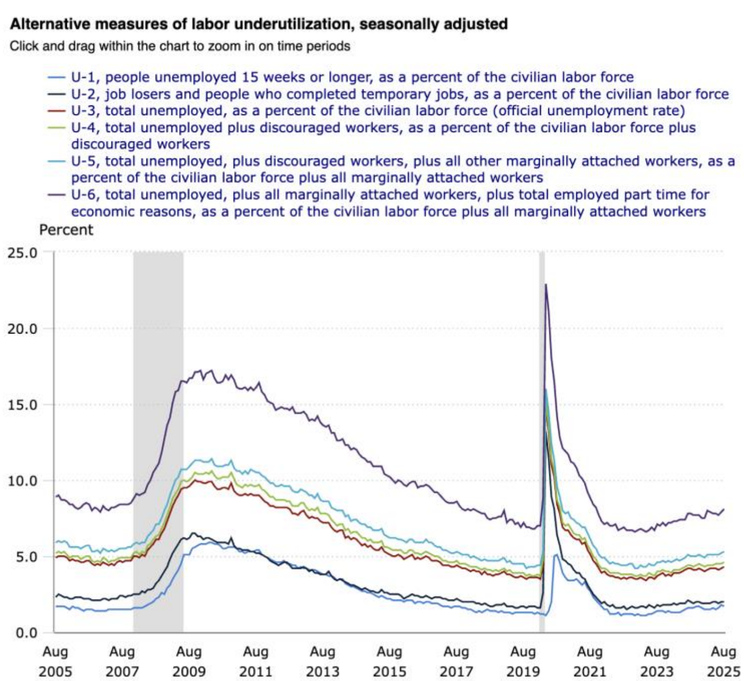
This is very much in line with what we see in the CES: modest job gains, flat average hours, and low wage growth. In conjunction with the JOLTS, we are able to see that the labor demand is clearly softening, which implies that there is less upward pressure for wage growth and smaller wage inflation.

Policy/Market Implications

So far, the Federal Reserve has been paying close attention to labor data, indicating that weak hiring, low wage growth, and large revisions all show that there is a reduced labor-inflation risk (indicating a future of rate cuts). It creates cause for concern regarding momentum and may cause some concern for broader consumer spending (since that is tied to wage growth).

Historical Patterns in U1-U6

Within the U1-U6 unemployment data provided by the BLS, short-term cyclical labor trends become clearer. By comparing the standard U3 rate with broader measures, we can identify the trends involved in marginally attached or part-time workers, for example, which can have larger implications on the general economy.



	December 2007	Date of recovery to pre-GFC levels
U6	8.8%	Mar 2017
U5	5.8%	Dec 2016
U4	5.2%	Feb 2016
U3	5.0%	Sep 2015
U2	2.5%	Aug 2015
U1	1.6%	Jun 2017

	Feb 2020	Date of recovery to pre-Covid levels
U6	7.0%	Mar 2022
U5	4.4%	Jul 2022
U4	3.7%	Dec 2022
U3	3.5%	Jul 2022
U2	1.6%	May 2022
U1	1.2%	Mar 2022

Analyzing unemployment data from the Global Financial Crisis (GFC) reveals a slow and uneven labor market recovery across the different measures of unemployment that persisted long after GDP growth had resumed. While the U3 rate returned to its pre-recession levels by September 2015, U5 and U6 did not fully recover until December 2016 and March 2017, respectively. Looking at these broader measures of unemployment reflects the "jobless recovery" dynamic of an endogenous incident where many displaced workers remained marginally attached or discouraged even as corporate profits rebounded. U6, which captures involuntary part-time workers and individuals loosely attached to the labor force, took the longest to return to normal, suggesting a general trend where firms rely on reduced hours and part-time hiring before restoring full-time positions during economic recovery. In this sense, the GFC provided a case study to analyze the run-up to and recovery from a severe economic downturn through the lens of cyclical unemployment measures.

In contrast, the COVID recession presents an exogenous case study, resulting in a sharp rise and much faster rebound across all unemployment measures. Although U6 rates spiked sharply during the 2020 shutdown, they returned to their pre-COVID levels by March 2022. Measures U2-U5 recovered shortly thereafter. Unlike the GFC, the Covid recession was driven by an abrupt shutdown rather than a gradual economic contraction, which allowed for a rapid employment rebound once mobility and demand returned. Even broader measures, such as U5 and U6, normalized within roughly two and a half years, far quicker than the seven to nine-year timeline observed after the GFC. This indicates Covid's shorter, less scarring cyclical impact.

When analyzing the combined U1-U6 line graph, a slight lag seems to be present during the GFC, with U6 beginning to rise before the other unemployment measures. One natural question that arises from this is whether early signs of slack measured in the U6 rate can help anticipate future shifts in the U3 headline unemployment rate. The logic for this would be that the broader U6 measure captures underutilization, such as involuntary part-time work or an increase in marginally attached workers. As such, when this additional slack begins to build, the gap between U6 and U3 could potentially be used as an early-warning indicator of softening labor conditions.

To determine whether this spread contains meaningful predictive information, it is worth conducting a linear regression, analyzing whether month-to-month changes in the U6-U3 spread are associated with subsequent changes in the following period's U3 unemployment rate. Focusing on changes rather than levels isolates short-run dynamics and avoids misleading correlations arising from long-run demographic or structural shifts. As such, the following regression results are from the next month's change in U3 on the current month's change in (U6-U3) to test whether incremental deteriorations in broader labor utilization reliably precede an increase in the headline unemployment.

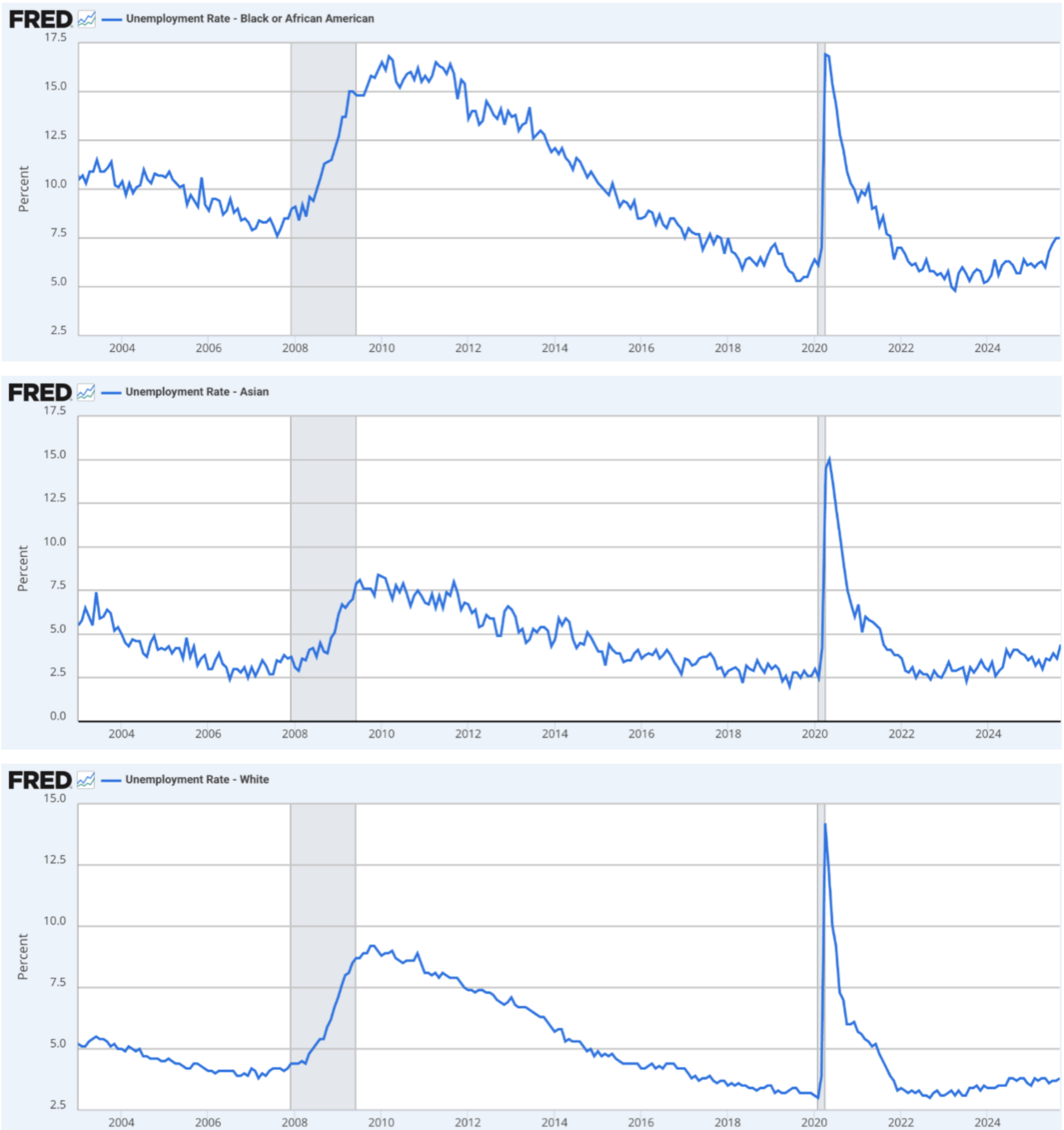
Statistic	**Value**
Slope (β)	0.3640
Intercept (α)	-0.00247
Standard Error of Slope	0.1457
t-Statistic	2.50
p-Value	0.013
R^2	0.0256

Table 1: Regression Results: $\Delta U3_{t+1}$ on $\Delta(U6 - U3)_t$

The regression results indicate that the month-to-month changes in broader underutilization carry statistically significant information about the following period's change in headline unemployment rate. When the U6-U3 spread widens by .1 percentage points, the unemployment rate tends to rise by about .036 percentage points in the following month. The t-statistic of 2.50 and p-value of .013 indicate that this relationship is unlikely to be due to random variation. The modest R^2 value of .0256 reflects the inherently noisy nature of monthly labor-market data and macro data in general. However, the significance of the slope underscores that movements in underutilization beyond U3 consistently precede shifts in the unemployment rate. All in all, the results support the interpretation that incremental increases in labor-market slack captured by a U6-U3 spread provide an early signal of short-term upward pressure on the U3 headline unemployment.

Additionally, given the cyclical nature of unemployment rates as a metric, it is useful to examine unemployment trends across major demographic groups. Pictured in *Figure 1* below are the unemployment rates for the demographic groups of Black or African Americans, Asians, and White people from 2003 to the present. Keeping the percentages on the y-axis in mind, Black or African American workers consistently experience the highest unemployment rates and the greatest sensitivity to recessions, indicating their relatively higher concentration in lower-wage or less formal employment relationships. Moreover, there is an especially pronounced spike during the GFC and Covid-19 shock and a slower return to pre-recession levels. In contrast, unemployment rates for Asian and White workers are lower and relatively close to one another over most of the sample. Overall, the data suggest that economic shocks may amplify unemployment disparities across demographic groups, even as the general cyclical pattern remains similar. It is also worth noting that the unemployment rate graph for white people seems a lot less choppy and volatile compared to the other two. This hints at the White labor force being far larger than the Asian or Black labor force. This likely reflects the fact that the White labor force is far larger, and thus each additional unemployed individual represents a smaller share of the population. In general, a larger denominator in the unemployment formula produces a smoother, less sensitive time series.

Figure 1: Unemployment rates across demographics



Long-term Structural Trends (LFPR)

While unemployment measures like U1 through U6 primarily capture cyclical trends in the economy as they fluctuate with short-term changes in labor demand and business cycles, changes in LFPR are more indicative of structural trends. Long-term shifts in demographics, social norms, or worker incentives may affect the size of the labor force itself. Intuitively, this makes sense since the denominator of the unemployment rate is the labor force. While U1-U6 measures changes within the existing labor pool, LFPR measures how that pool itself expands or contracts over time due to deeper, structural forces.

Looking at *Figure 2*, it is evident that the LFPR rose steadily throughout the second half of the 20th century and into the early 2000s. This reflects one of the most significant structural shifts in the U.S. labor market: the large-scale entry of women into paid employment. Beginning in the 1960s and accelerating through the 1970s and 1980s, reasons such as the changing social norms, increasing educational attainment, declining fertility rates, and expanded access to professional opportunities all contributed to a sharp increase in female labor force participation. Indeed, *Figure 3* reinforces this pattern, showing a clear structural increase in the women's LFPR, while men's LFPR is gradually declining. For women, this may be attributed to an increase in clerical or managerial work, stronger anti-discrimination enforcement, or later childbirth. For men, the decline likely reflects fewer middle-skill physically intensive jobs or a reduced demand for men without a college degree.

However, the decline in the overall LFPR since the early 2000s largely reflects the aging of the U.S. population rather than a broad-based withdrawal from work. As the baby boom cohort has progressed into older age groups, where participation rates naturally fall, the demographic composition of the labor force has shifted towards individuals aged 55 and over. In other words, as slowing population growth prevails, older populations grow faster than younger ones, which reduces net population growth and depresses LFPR. Thus, it is useful to split the total population into prime-age and 55 years and over when considering LFPR to accurately evaluate willingness to work without including the secondary effects of an aging population. According to *Figure 4*, prime-age participation has remained relatively stable and has even rebounded in recent years. However, in recent years, the non-prime-age LFPR has failed to rebound to its pre-COVID level, reflecting the possibility that many older workers lack sufficient incentives to return after periods of forced labor detachment. All in all, the demographic headwind of an aging population explains most of the long-term decline in LFPR beginning in the early 2000s, showing how changes in the population structure may skew headline labor market indicators even when the underlying labor supply behavior among prime-age adults remains stable.

Figure 2: Overall Labor Force Participation Rate

Figure 3: Labor Force Participation Rate separated by gender

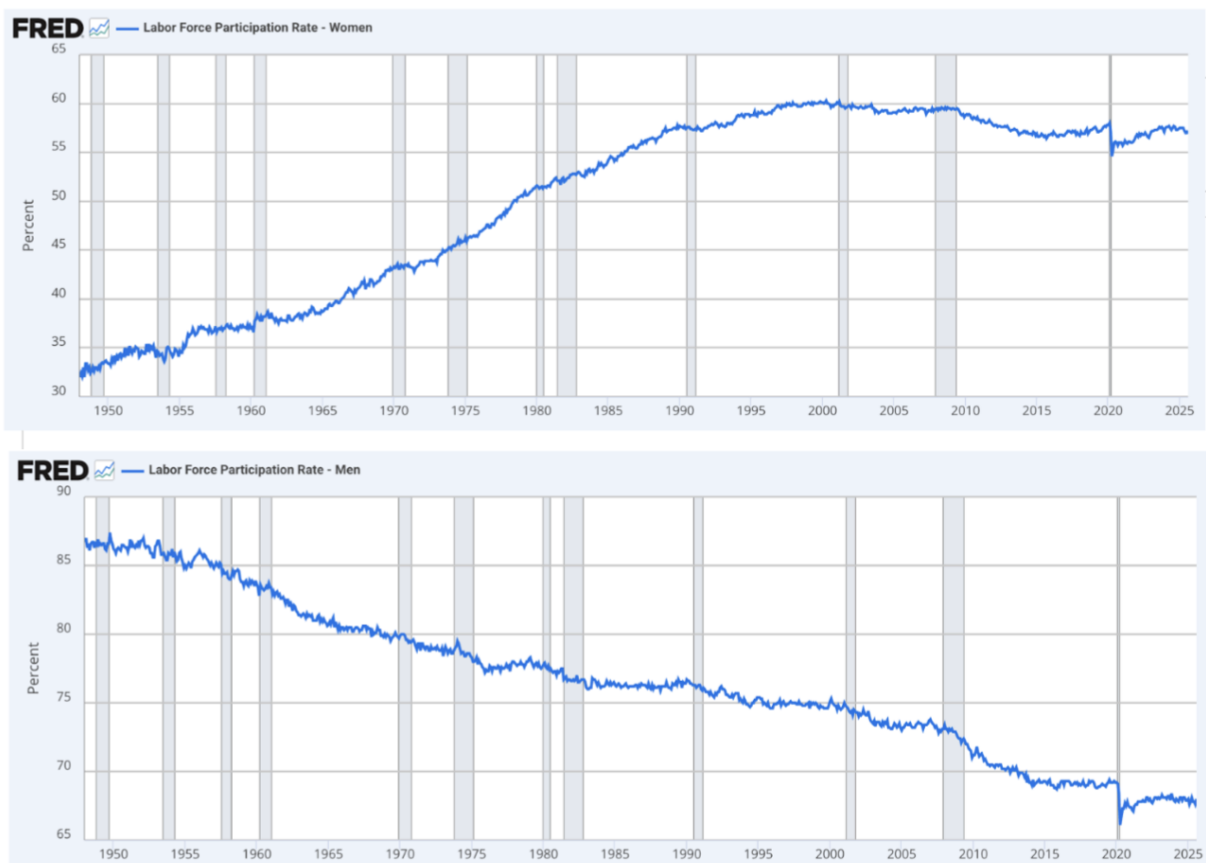
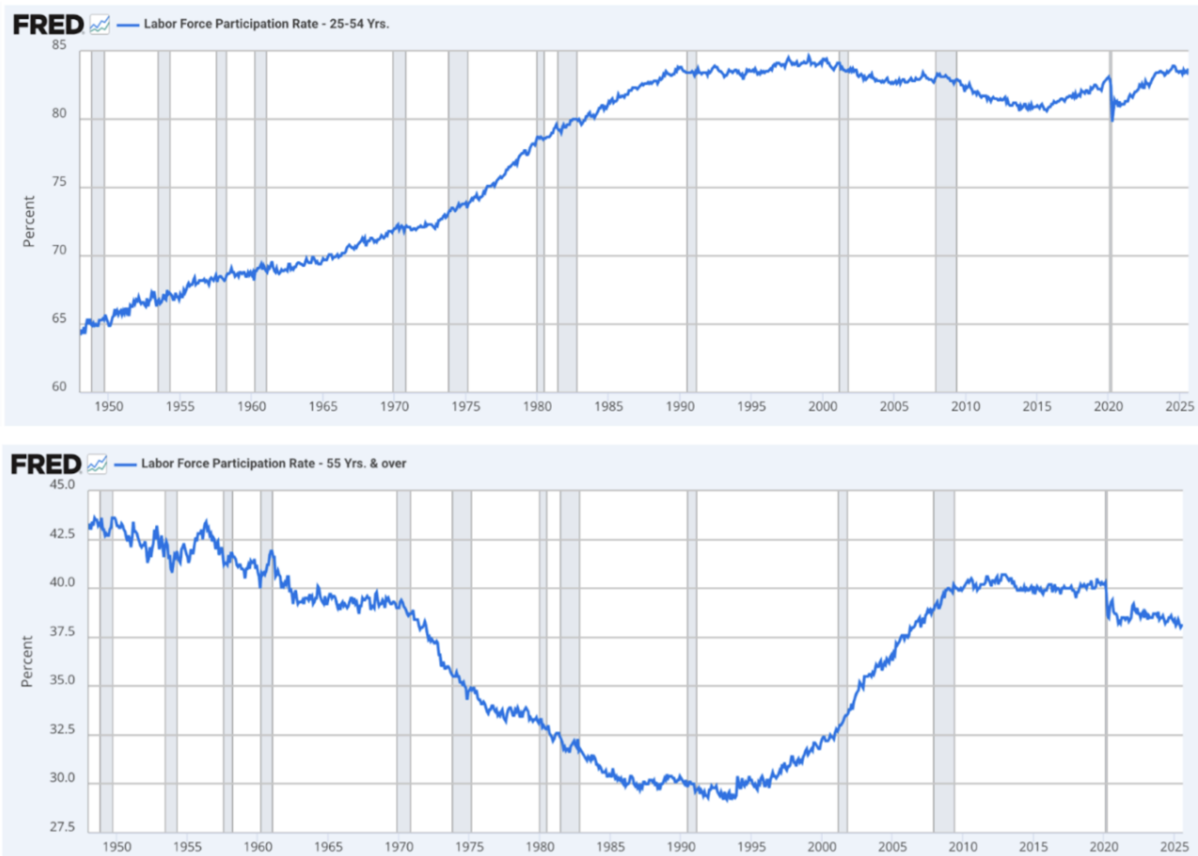


Figure 4: Labor Force Participation Rate Separated by Prime Age (25-54 Yrs..) and 55 Yrs. and over



Market Reaction to Labor News

Effect on Non-Farm Payrolls

Current Period

Period	Release Date	Consensus (k)	Actual	Surprise (k)	S&P Prior Close	S&P Next Close	Return
Past Year				Actual - Consensus			
Aug-25	Sep-25	75	22	-53	6502.08	6481.5	-0.317%
Jul-2025	Aug-25	**105**	**74**	**-31**	**6339.39**	**6238.01**	**-1.599%**
Jun-2025	Jul-25	106	147	41	6227.42	6279.35	0.834%
May-2025	Jun-25	126	139	13	5939.3	6000.36	1.028%
Apr-2025	May-25	138	177	39	5604.14	5686.67	1.473%
Mar-2025	Apr-25	**140**	**228**	**88**	**5670.97**	**5074.08**	**-10.525%**
Feb-2025	Mar-25	160	151	-9	5738.52	5770.2	0.552%
Jan-2025	Feb-25	174	143	-31	6083.57	6025.99	-0.946%
Dec-2024	Jan-25	**165**	**256**	**91**	**5918.25**	**5827.04**	**-1.541%**
Nov-2024	Dec-24	220	227	7	6075.11	6090.27	0.250%
Oct-2024	Nov-24	100	12	-88	5705.45	5728.8	0.409%
Sep-2024	Oct-24	150	254	104	5699.94	5751.07	0.897%
Aug-2024	Sep-24	**100**	**12**	**-88**	**5503.41**	**5408.42**	**-1.726%**

***Note: April 2025 Return includes Liberation Day Outcomes**

COVID–19 Period

Period	Release Date	Consensus (k)	Actual	Surprise (k)	S&P Prior Close	S&P Next Close	Return
COVID Era				Actual - Consensus			
Apr-2020	5/8/20	-22000	-20537	1463	2881.19	2929.8	1.69%
May-2020	6/5/20	**-7500**	**2509**	**10009**	**3112.35**	**3193.93**	**2.62%**
Jun-2020	7/2/20	3230	4800	1570	3115.86	3130.01	0.45%
Jul-2020	8/7/20	1480	1763	283	3349.16	3351.28	0.06%
Aug-2020	9/4/20	1350	1371	21	3455.06	3426.96	-0.81%
Sep-2020	10/2/20	859	**661**	**-198**	**3380.8**	**3348.44**	**-0.96%**
Oct-2020	11/6/20	580	638	58	3510.45	3509.44	-0.03%
Nov-2020	12/4/20	460	245	-215	3666.72	3699.12	0.88%
Dec-2020	1/8/21	50	-140	-190	3803.79	3824.68	0.55%
Jan-2021	2/5/21	105	49	-56	3871.74	3886.83	0.39%
Feb-2021	3/5/21	200	379	179	3768.47	3841.94	1.95%
Mar-2021	4/2/21	**660**	**916**	**256**	**3972.89**	**4077.91**	**2.64%**

*Note: The S&P 500 Returns were taken from the last close of the day preceding the data release to the close of the day of the data release.

1. Context

Nonfarm Payroll (NFP) releases are considered one of the most important macro indicators since they indicate the labor demand, income levels, and economic growth. I defined employment surprises as (actual job gains – consensus), and they often influence rate expectation market sentiment. There was some research done by the former Federal Reserve chair, Ben Bernanke, which found that the surprises can contribute to market volatility in the short-term (Bernanke 2005).

2. Overview of Macroeconomic Periods

The COVID Era (2020 – 2021) was typically stimulus-driven and extremely liquid markets. During this time period, we see significant labor market volatility (with massive job losses as well as hiring periods), near-zero interest rates, significant fiscal stimulus, and stock market activities. We see that strong job growth was the initial evidence of economic recovery, and we used stimulus as a means to get there (leading to more market activity as well).

Transitioning to the current period, where we are moving towards normalization, we see a much more Fed-dominated environment. Inflation is still well above the 2% target, tighter labor markets, and there is also more market sensitivity to interest rate expectations.

3. Data Summary

Employment surprises ranged from extremes of both sides of the spectrum (+10,009k to -256k). However, the S&P reactions were mostly positive on significant negative surprises, ex:

- May 2020
    - Consensus: -7500k
    - Actual: +2509k
    - Surprise: +10,009k
    - S&P Response: +2.62%

Even negative surprises had positive or mildly negative returns, indicating that there would be several confounding factors then, seeing that there may still be market reactions to stimulus expectation or Fed actions. In the past year, we have seen much more moderate surprises (-88k to +104k), but market reactions were more directional and tied towards Fed expectations. Several upside surprises, which would logically be associated with economic growth, instead resulted in equity declines. The +91k surprise in

January 2025 corresponded with a 1.54% drop in the S&P 500, while the +88k surprise in April 2024 resulted in a sharp decline (due to Liberation Day news).

4. Findings and Interpretations

The data reinforces the importance of direction of the labor market, especially in the COVID era, where we see upside surprises followed by equity rallies, and downside surprises relatively limited due to stimulus protections. However, in 2024 – 2025, the labor market's relationship with equities is significantly more asymmetric and nonlinear due to other changing economic factors.

We can attribute some of this difference between the periods to forecasting accuracy and structural labor trends. During the pandemic, forecasting employment was extremely difficult due to disruptions, sector-specific shutdowns, and rapid growth. Consensus estimates were regularly missed by several 100k's, and the markets may discount these errors because of the macro narrative. The more normalized labor market today sees smaller month-to-month deviations, making the surprises more significant.

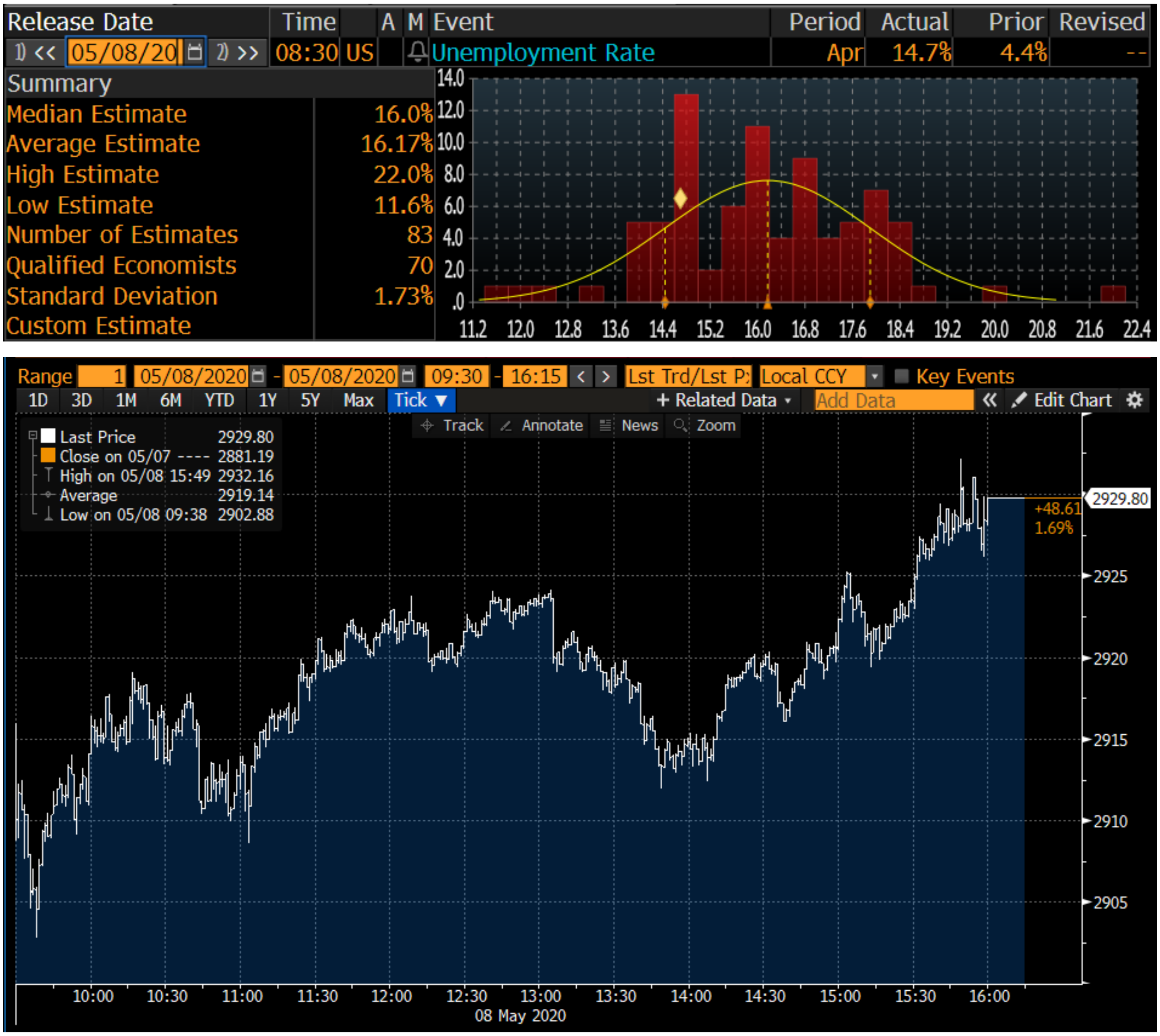
Several structural factors also contributed to the complexity when estimating. Demographic aging, immigration, sectoral hiring, and remote-work availability all played a part in changing labor data estimations and the real figures that were released. In a period where we see sticky wages and labor shortages, the small upside surprises were seen as reinforcing inflation concerns.

Taking the two periods, we can see that the labor-market data cannot be a good indicator of equity returns, and there is more of an emphasis on how the labor market relates to current macroeconomic trends. During the COVID period, employment gains were a sign that the economy was recovering from a recession, and monetary policy was supportive of it. In contrast, during 2024-2025, employment strength influenced monetary policy and raised concerns for a 'slow down'.

In the market today, as long as inflation is above the target and the labor market is relatively tight, employment reports will likely continue to have a significant influence on short-term market volatility.

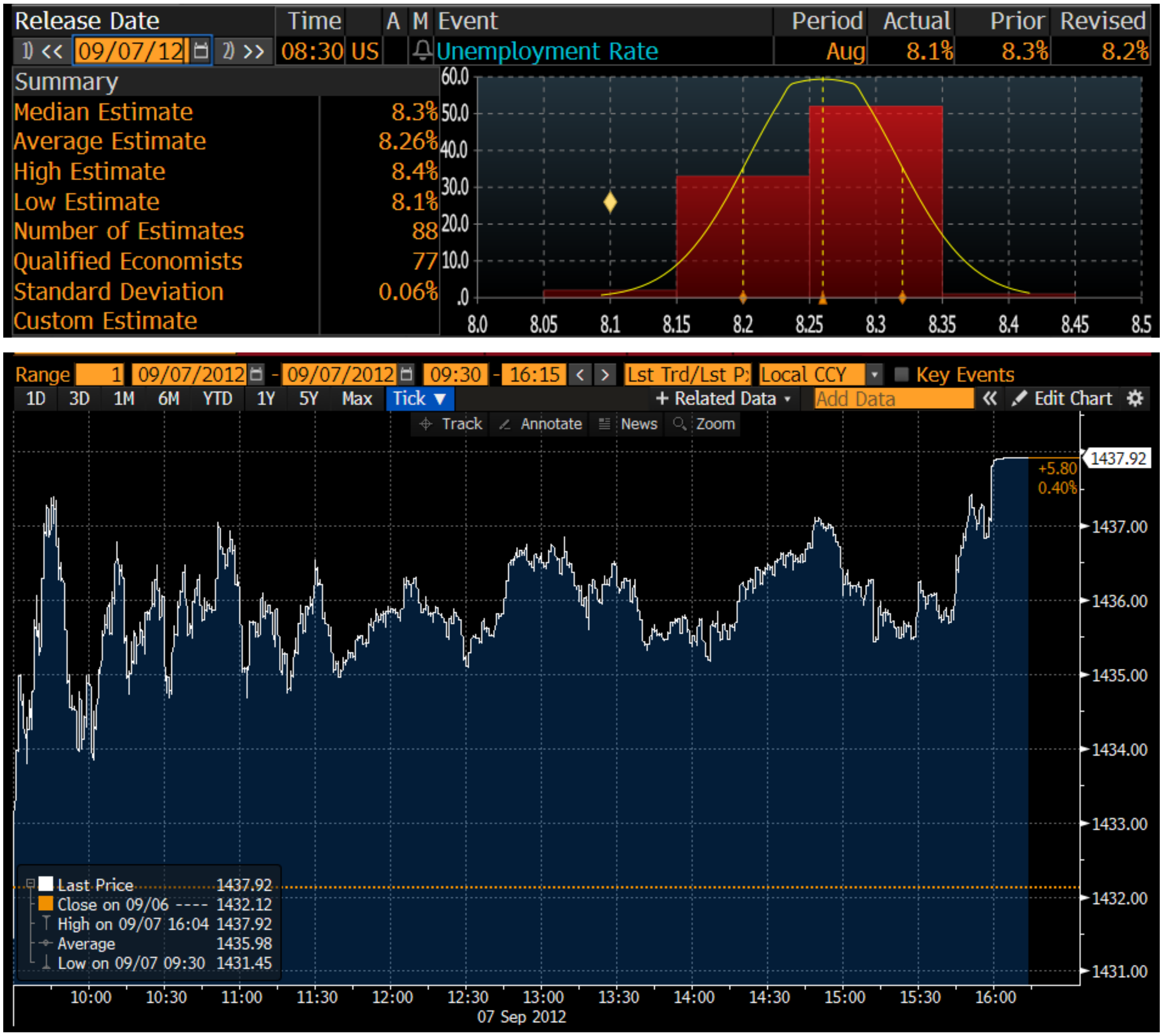
Effect on U3 Employment Rates in Different Scenarios

Figure 5: April 2020



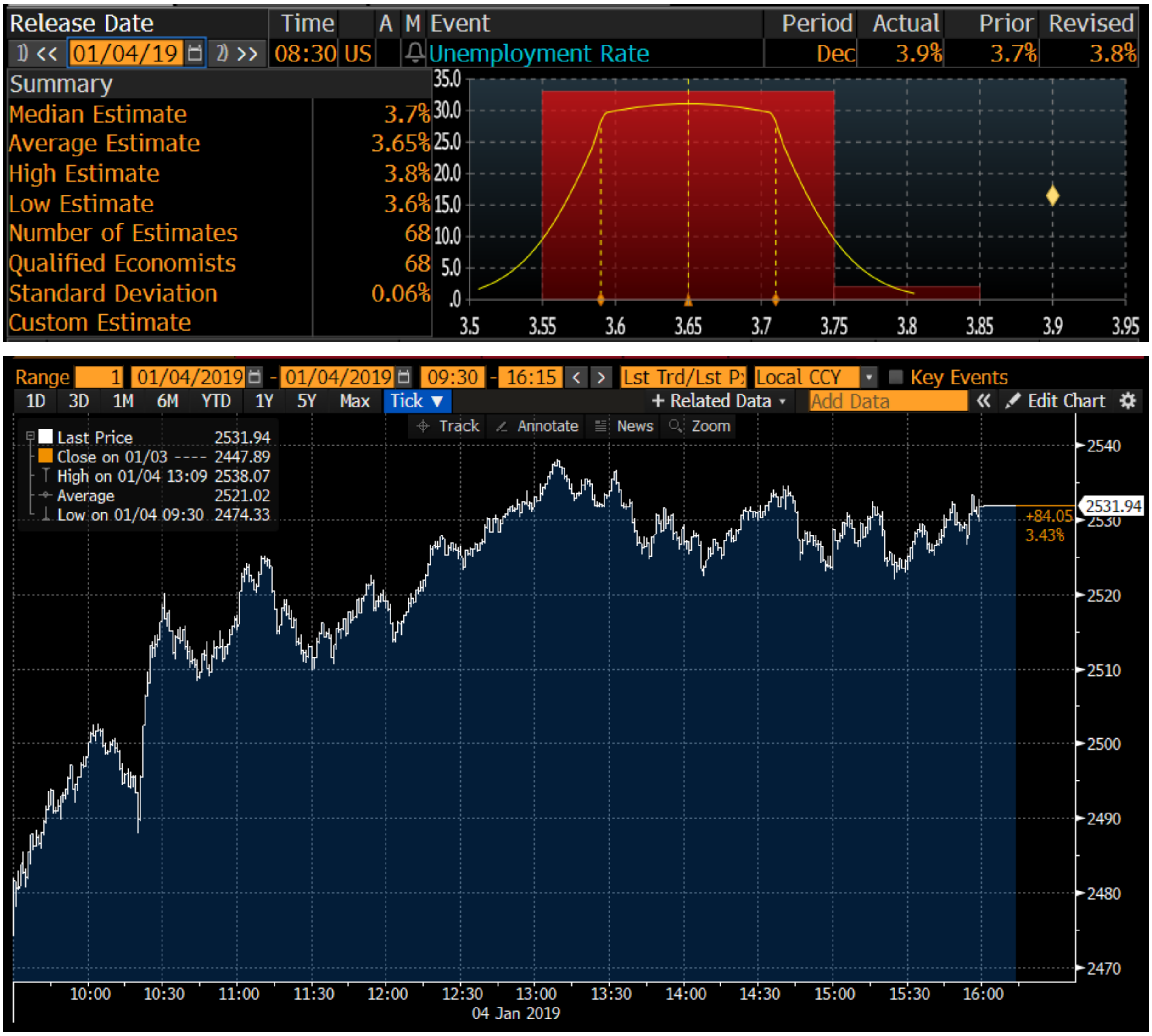
The April 2020 unemployment report was one of the most anticipated and anxiety-inducing data releases in modern economic history. Given that April was the first full month after the COVID-19 lockdowns, many experts struggled to anchor expectations in regard to the headline unemployment rate. As seen in *Figure 5*, there was a 1.73% standard deviation in estimates (ranging from 11.6% to 22.0%) and a median of 16.0%, encapsulating a level of uncertainty rarely seen in labor market forecasting. The actual rate came in at 14.7%, and the S&P rose 1.7% intraday. This reaction underscored that the equity markets had already digested weeks of negative labor market signals and investors were more focused on the policy response, including massive Fed interventions and multi-trillion-dollar fiscal stimulus packages.

Figure 6: August 2012



Although the August 2012 unemployment rate came in slightly better than expected (8.1% vs. 8.3% median forecast), markets largely interpreted this report as confirmation that labor market conditions remained fundamentally weak. This was because the improvement was driven by a decline in labor force participation rather than healthy job creation, so a shift in the denominator of the unemployment formula was the primary reason for this beat in expectations. The root of the unemployment problem was not solved. With the September FOMC meeting approaching later that year, the disappointing internals of the report increased expectations that the Fed would initiate QE3. This major asset-purchase program would be aimed at pushing down long-term interest rates and providing additional support to the credit markets. This policy-driven interpretation helps explain the intraday equity rally in the bottom panel of *Figure 6*. Rather than responding directly to the unemployment figure itself, investors appeared to be pricing a higher probability of near–term monetary stimulus.

Figure 7: December 2018



The slightly higher-than-expected unemployment rate for December (3.9% vs. 3.7% median forecast) reinforced concerns that the labor market was beginning to cool and economic momentum was softening heading into 2019. As such, this data was quickly viewed through a policy lens rather than a purely economic one. Throughout 2018, the Fed imposed a rate-hike cycle, and a cooling labor market strengthened the argument that the Fed should pause its tightening campaign and consider a more dovish stance. Thus, the S&P rallied on the day as markets priced in a reduced probability of further rate hikes, and this interpretation was validated hours later after the unemployment data release when Jerome Powell signaled greater flexibility and willingness to pause rate hikes if economic conditions warranted. The dovish pivot catalyzed by a softer-than-expected unemployment print helped stabilize equities after one of the most volatile fourth quarters in post-GFC history.

Views on Upcoming Release (December BLS Report 12/16)

From the Federal Reserve's current assessment of the labor market – based in part on third-party private-sector sources—policymakers are indicating that the "outlook for employment and inflation has not changed much" since October (Powell, 2025). There is growing concern, however, that official statistics may be overstating recent hiring. Much of this stems from increasingly volatile revisions and a general slowdown in job growth, raising the possibility that revisions may ultimately flip the direction of change, revealing job losses rather than gains. The BLS is planning methodological adjustments to the revisions process—particularly within the CES birth-death model—to improve accuracy, but these changes will not take effect until February.

A broader narrative has emerged suggesting that upcoming job numbers continue to be overstated and that the underlying labor market may be in weaker condition than reported. Private payroll data has shown an estimated loss of 32,000 jobs, pointing to an unexpectedly soft reading, and several large employers like UPS, Amazon, and Verizon have recently announced significant job cuts, which may or may not be reflected in the upcoming report.

That said, there are still competing signals pointing to a more stable or modestly expanding labor market. Through September, payrolls grew by 119,000 jobs, and weekly jobless claims have remained relatively stable. As we approach the December report, the initial direction of these indicators will help set the tone for monetary policy discussions as the Federal Reserve navigates the final stretch of Jerome Powell's term.

As we get closer to the December 16th release, we have 3 scenarios that emerge regarding the labor data:

- **Weaker Than Expected:** This would push another cut cycle going into the new year. It also puts strain on the current administration, as we are maybe seeing the first signs of decline due to tariffs or other recent macroeconomic involvements.
- **As Expected:** This leads us to focus on the secondary series (JOLTs and LFPR) and determine if there is a significant structural change happening. Specifically looking at the private sector, to delineate it from the DOGE layoffs, as well as construction hiring, due to its interest rate sensitivity.
- **Stronger Than Expected:** This makes Federal Reserve actions significantly more murkier going into 2026, as we are heading into a tighter labor market. It strengthens the narrative of the current administration regarding reshoring and tariff practices. This would also place significant emphasis on AI growth (and theories of a 'bubble') going forward as well.