What Accounts for the Growing Divergence between Employment Measures?

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Summary:

Our analysis reveals a significant and persistent divergence between employment measures from the Current Employment Statistics (CES) and Current Population Survey (CPS). Adjusting for the net birth-death contribution of businesses only partially explains this gap. The remaining large discrepancy is likely due to an underestimation of population growth in the CPS, potentially linked to recent immigration fluctuations. This finding has substantial implications for understanding the current labor market: adjusted CPS data reveals a more robust labor market with healthy demand and rapid supply growth from the beginning of 2023 to June 2024, contrasting with the unadjusted CPS data, which suggest only tepid demand growth. Our study underscores the importance of accurate estimates and continuing data revisions for informed policy decisions.

Key findings:

1. The Current Employment Statistics (CES) measure of employment is likely overstating the level of employment in 2024. Our analysis suggests that the CES forecast for the net birth-death contribution to employment overstates the cumulative contribution to employment by 440,000.

2. This downward adjustment to CES employment only explains a small share of the current gap of 3.9 million between the CES and Current Population Survey (CPS) measures of employment (after adjusting the CPS to be consistent with the CES measure).

3. The remaining discrepancy is like due to an underestimation of population growth in the CPS, likely to the result of an unexpected increase in net immigration.

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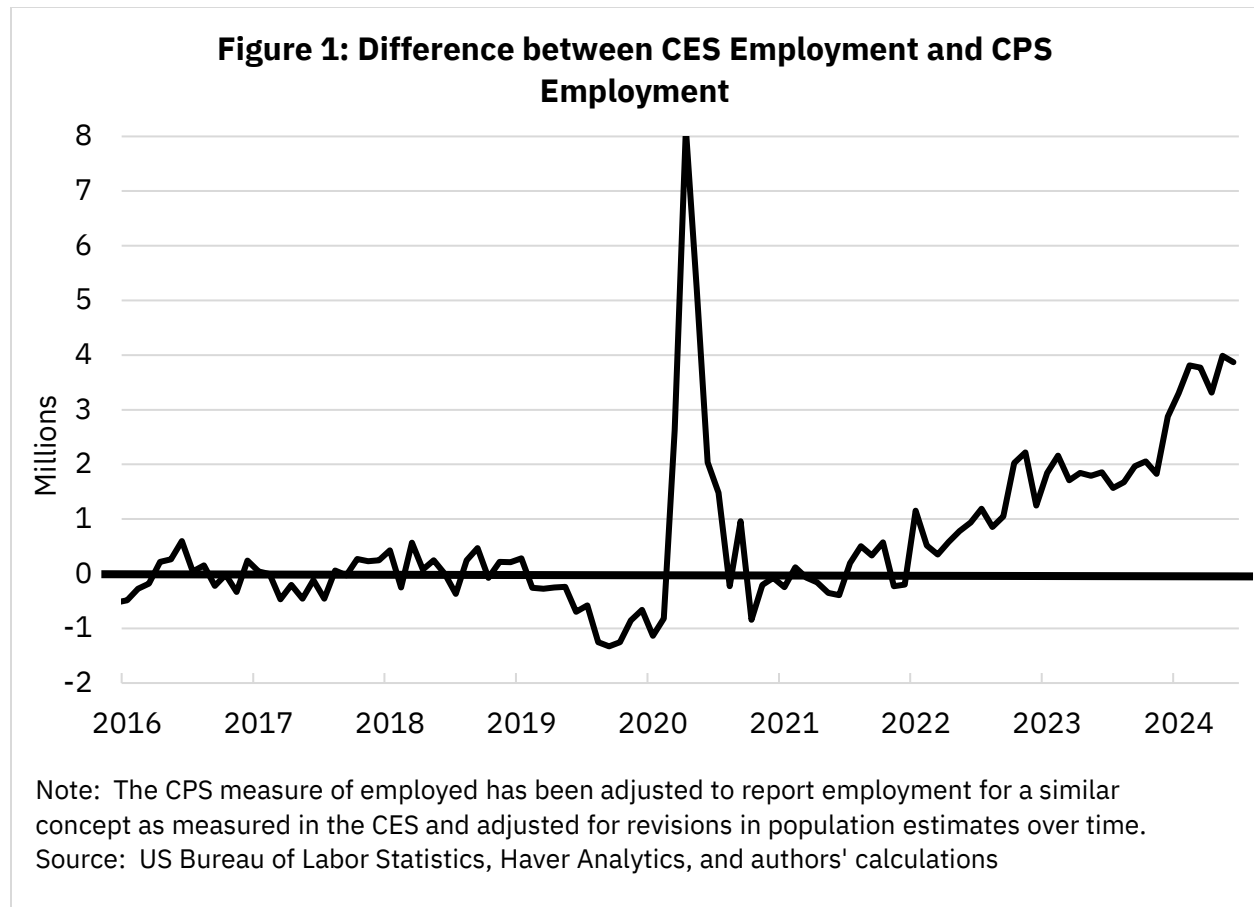
1.   Introduction

During the past three years, the two main employment indicators for the US economy have been sending conflicting signals about the pace of employment growth. Payroll employment according to the Current Employment Statistics (CES) survey has increased by 9.4 million since November 2021. Meanwhile, the number of employed people according to the Current Population Survey (CPS) has increased by 5.3 million during the same period (adjusted to report employment for a similar concept as measured in the CES and adjusted for revisions in population estimates over time).[1] The emergence of such a large gap in employment growth measures is unusual and certainly inconsistent with data from the years preceding the Covid pandemic when both measures were providing similar signals regarding the level of employment (figure 1). This article investigates one possible concern with the CES employment measure and discusses implications of this disagreement of employment measures for assessing current economic and labor market conditions.

Our analysis assesses the likely contributors to the significant divergence between the CES and CPS employment measures. Adjusting for the net birth-death contribution of businesses narrows this gap, but a substantial discrepancy remains. The majority of the unexplained difference is likely due to an underestimation of population growth in the CPS survey, supported by a back-of-the-envelope calculation and evidence from the Congressional Budget Office's (CBO) upward revision of population estimates.

Our finding has important implications for assessing labor market conditions. Unadjusted CPS data suggests tepid labor demand growth and modest labor supply growth since early 2022. Adjusting the CPS data to be consistent with the adjusted CES employment measure, however, reveals healthy labor demand growth and rapid labor supply growth during the same period. These contrasting views highlight the importance of providing the best assessment of underlying labor market conditions for policy makers. The adjusted employment data series from this analysis points to economic conditions characterized by moderate growth in labor demand accompanied by strong growth in labor supply.

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[1] Haver Analytics is the source for the CPS measure of the number of employed has been population-smoothed and adjusted to be compatible with the payroll survey.
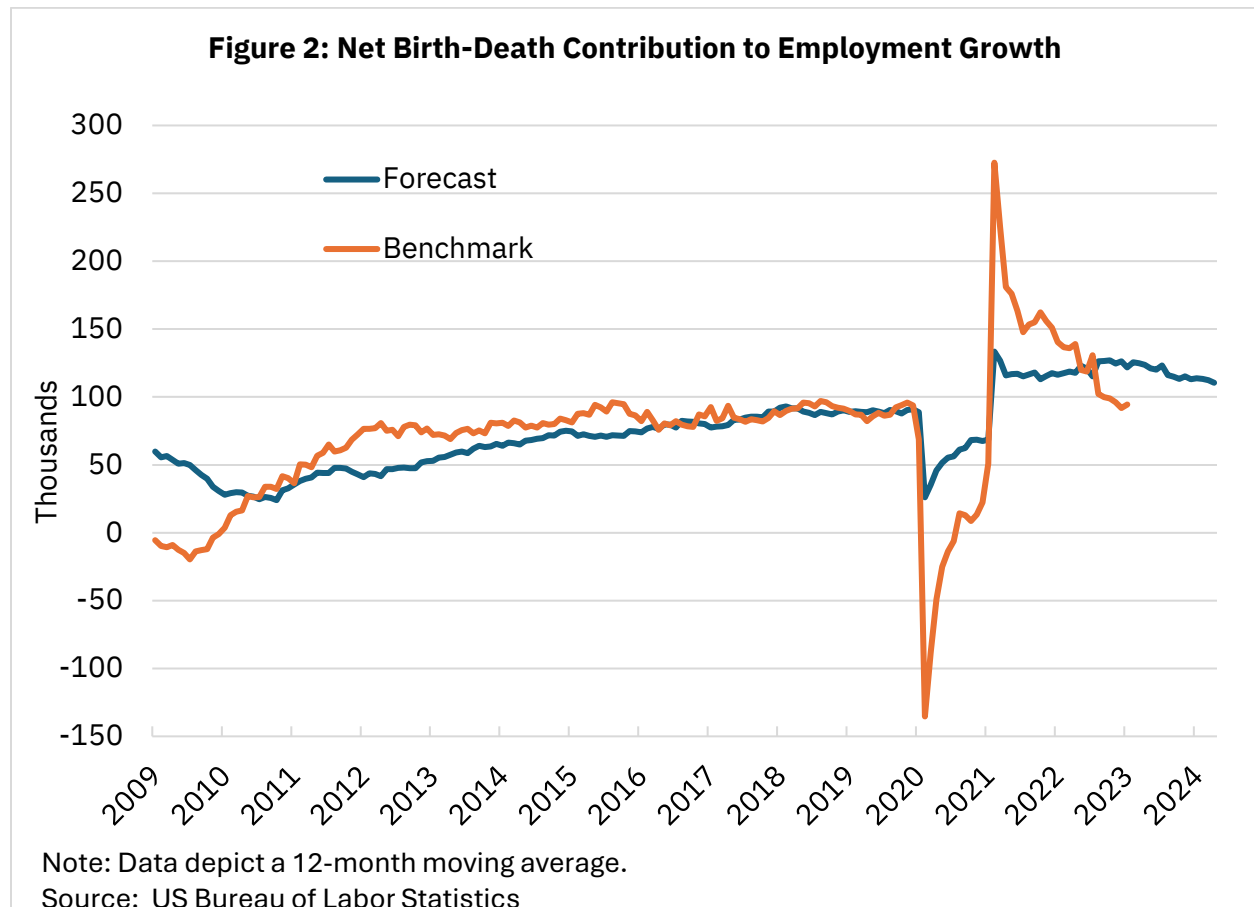
Figure 1: Difference between CES Employment and CPS Employment

Note: The CPS measure of employed has been adjusted to report employment for a similar concept as measured in the CES and adjusted for revisions in population estimates over time.
Source: US Bureau of Labor Statistics, Haver Analytics, and authors' calculations

2.   Assessing current measurement concerns for CES payroll employment

When discrepancies arise between the CES and CPS employment measures, the CES employment measure is usually assumed to be the better indicator for measuring employment because of its larger sample size. The CES employment measure is based on a survey of 119,000 businesses and government agencies, representing approximately 629,000 individual worksites. The survey sample includes approximately one-third (52 million) of all nonfarm payroll jobs. The CPS survey is a sample of about 60,000 households providing labor market information on approximately 110,000 individuals. Thus, given the much larger size of the sample, the CES measure has a much smaller margin of error in its measurement of employment.

However, recent evidence has emerged to suggest that one component of the CES employment measure might be overstating the current level of employment. A primary source of nonsampling error for the CES survey is the result of the inability of the sample to capture employment growth generated by new businesses. To account for this issue, the US Bureau of Labor Statistics (BLS) uses an estimation procedure to account for employment gains from business births and employment losses resulting from business deaths, which is called the net birth-death model. Each month, the BLS computes a forecast of the net birth-death

contribution to employment that is incorporated into the CES payroll employment measure. This forecast is then updated each February, when the BLS computes a benchmark revision for data through March of the prior year. Currently, the most recent benchmark revision has provided data through March 2023. All CES employment data after March 2023 currently rely on the forecast of the birth-death model. The most recent data from the benchmark revision suggest that the net birth-death contribution might be trending below the current forecast (figure 2). If true, this would suggest that employment growth from April 2023 to present might be overstated.

Figure 2: Net Birth-Death Contribution to Employment Growth

Note: Data depict a 12-month moving average.
Source: US Bureau of Labor Statistics

To investigate this potential employment mismeasurement issue, we use information from relevant labor market data series to provide an estimate of the benchmark revision to net birth-death contribution to employment growth. This estimate will allow us to assess by how much the current measure for CES employment might be overstated because of the forecast for the net birth-death contribution to employment.

We use information from relevant labor market indicators to estimate the benchmark net birth-death contribution from April 2023 to June 2024. The first variable used is the quarterly series on the net birth-death contribution to employment growth from the Business Employment Dynamics (BED) data produced by the BLS. This is a quarterly series that currently

is available through the third quarter of 2023, which will provide information covering six months beyond the current endpoint for the benchmark series. The data from this series suggest that the net birth-death contribution to employment growth has continued to decline through the third quarter of 2023.

The next two labor market variables that we use are the Kansas City Fed Labor Market Conditions Indicators (LMCI). The KC Fed LMCI consolidates information from 24 labor market variables into two measures that capture the level of labor market activity and the momentum of the labor market (Hakkio and Willis, 2013 and 2014). These two measures are available through June 2024 and therefore provide measures of broad labor market conditions up to the present. Both measures are correlated with the benchmark net birth-death contribution series. For the period between March 2009 and December 2019, the correlation between the benchmark series and the KC Fed LMCI Level of Activity is 0.66, and the correlation between the benchmark series and the KC Fed Momentum Indicator is 0.78.[2]
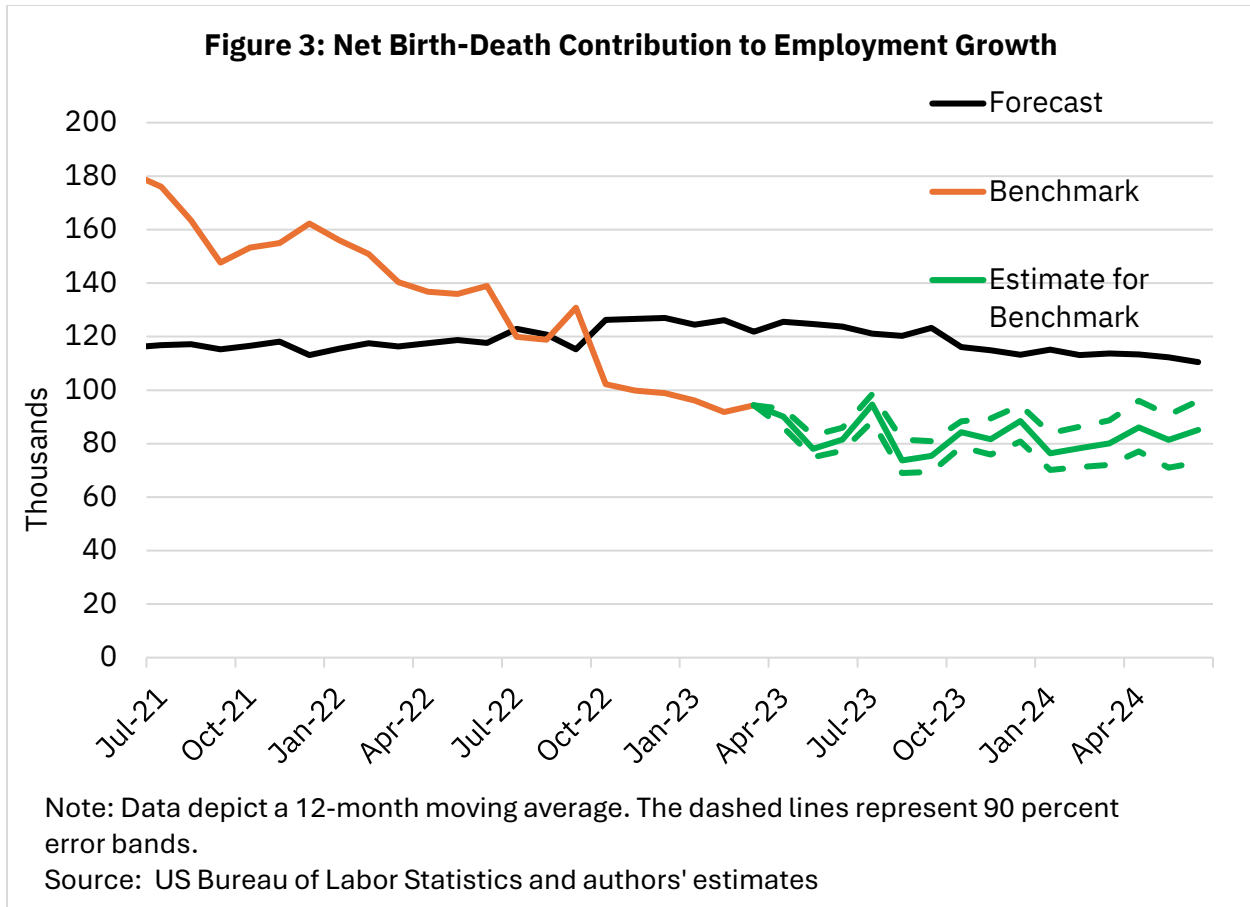
We use the modeling methodology of Waggoner and Zha (1999) to estimate the benchmark net-birth death contributions to employment growth, using the dynamic relationships between the historical benchmark net birth-death contribution series (observable from November 2021 to March 2023) and three other data series spanning longer periods: the BED net birth-death contribution to employment growth and the two Kansas City Fed LMCI indicators: Level of Activity and Momentum. The date sample for the estimation is November 2021 to June 2024, where November 2021 was selected as the start date when the CES and CPS employment measures began to diverge in recent years.[3]

The estimated series for the benchmark net birth-death contribution to employment growth from April 2023 to June 2024 suggests that the cumulative net birth-death contribution during this period is approximately 440,000 fewer jobs than the BLS forecast (currently used to compute CES employment) implies. This translates into a reduction in the monthly employment growth rate during this period of about 35,000 jobs per month less than the published CES data currently report (figure 3). The 90 percent error bands shown in the figure indicate the precision of these estimates that incorporate the three other data series covering more recent months.
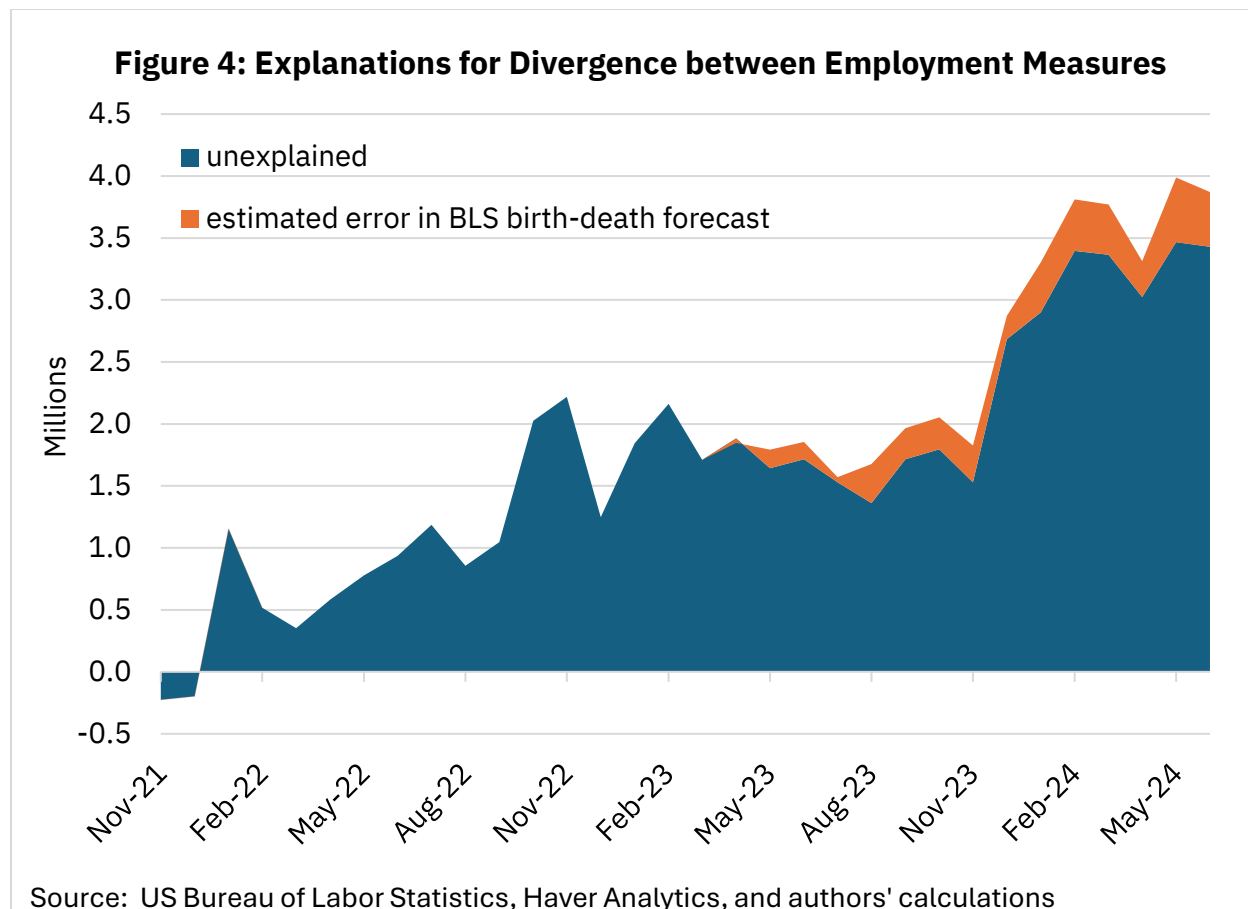
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[2] All measures are expressed as 12-month moving averages when computing these correlations.
[3] See the appendix for a detailed description of this analysis.

Figure 3: Net Birth-Death Contribution to Employment Growth

Note: Data depict a 12-month moving average. The dashed lines represent 90 percent error bands.
Source: US Bureau of Labor Statistics and authors' estimates

3.   Assessing the divergence between CES and CPS employment measures

The estimated error in the forecast of the net birth-death contribution to employment growth only accounts for a small portion of the deviation between the CES and CPS employment measures. Using the estimated values, we recalculate an adjusted CES employment level by removing the forecast value for the net birth-death contribution to employment and replacing it with our estimate of the benchmark net birth-death contribution. With this recalculation, the adjusted CES employment level for June 2024 is approximately 440,000 workers lower than the published CES employment level. Although this is an economically significant adjustment to CES employment, it only accounts for a minor share of the divergence between CES and CPS employment measures (figure 4).

Figure 4: Explanations for Divergence between Employment Measures

Source: US Bureau of Labor Statistics, Haver Analytics, and authors' calculations

We can think of several candidates that could account for the unexplained divergence between employment measures. First, sampling errors in the CES and CPS surveys might contribute to this gap, but it seems unlikely that such errors would accumulate over time to account for much of this growing divergence. Second, adjustments to the next CES benchmark (in addition to updating the net birth-death contribution) in February 2025 could further reduce the level of CES employment and thereby narrow the divergence. Third—and in our minds the most likely contributor—is that the current population forecast underlying the CPS survey might not reflect recent population growth in the economy. In January 2024, the CBO significantly increased its estimate for population growth during the past several years, with upward revisions to net immigration accounting for most of the upward revisions (CBO 2024), but such adjustments have not yet been made to the CPS Survey. If the population assumption for the CPS survey should understate actual population growth, this implies that the employment measure in the CPS survey, which depends on the assumption for population growth, would understate the true employment level.

The recent upward revision to population growth by the CBO appears to be of a sufficient magnitude to account for a majority of the unexplained divergence in employment measures. To check this explanation with a back-of-the-envelope calculation, we use the
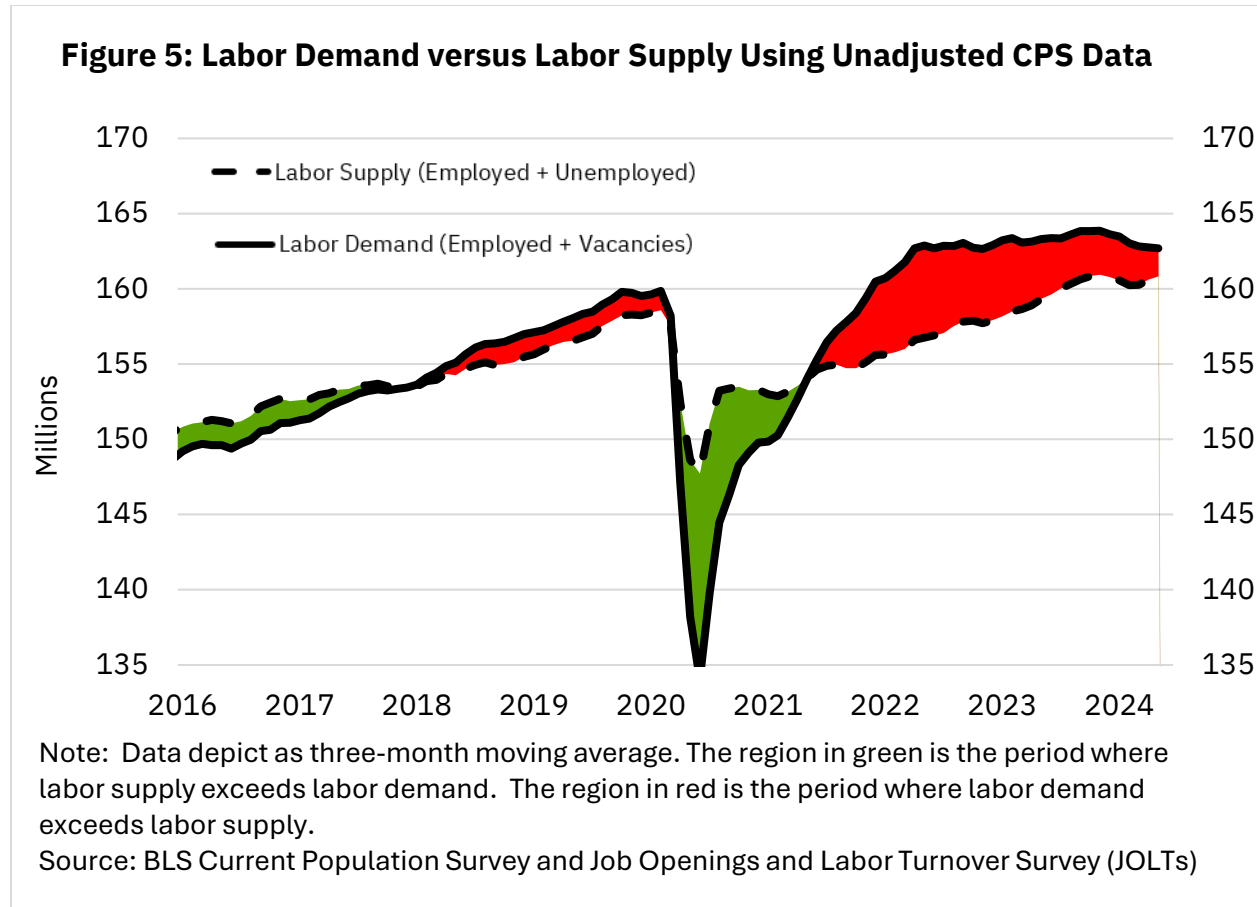
upward revision to net immigration from the CBO of 5.4 million in the years 2022 to 2024. We then incorporate the assumption from Edelberg and Watson (2024) that 81 percent of new immigrants are over age 16, civilian, and noninstitutionalized. Then applying an assumption that 60 percent of net immigrants over age 16 are employed, we arrive at a back-of-the-envelope estimate that this upward revision to net immigration of 5.4 million would translate into an additional 2.6 million employed workers. This estimate of 2.6 million additional employed workers from the upward revision to net immigration from the CBO would account for about 75 percent of the unexplained gap in figure 4.

Importantly, the revision to the CBO population estimate was based on data unrelated to the unexplained divergence between the CES and CPS employment measures. But the similar magnitudes of the implied employment shifts from these two sources suggest that the main contributor to the unexplained employment divergence is mostly likely a faster-growing population than the CPS survey, as it's constructed, currently assumes.
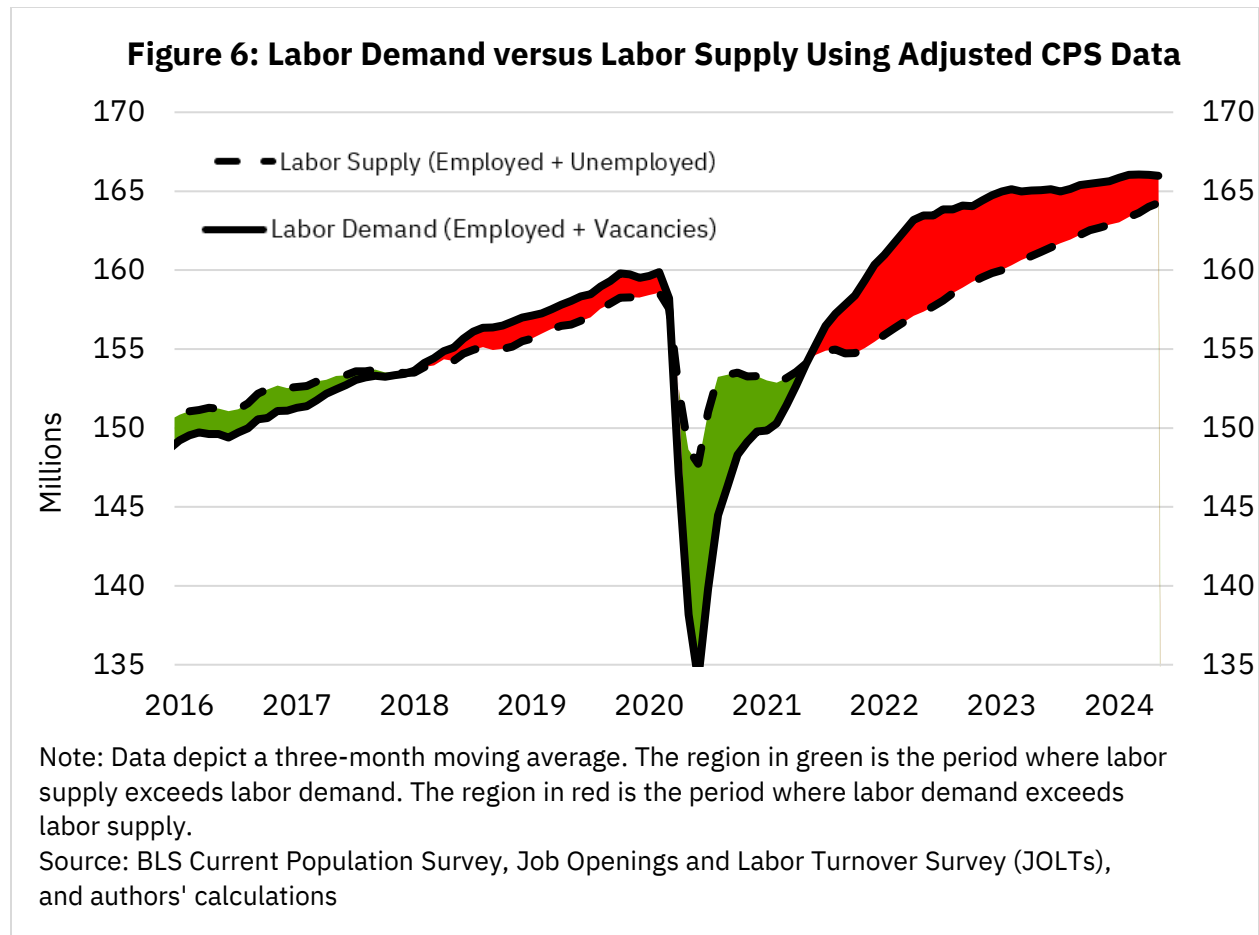
4. Implications of alternative employment measures for assessing current conditions

The reconciliation of the differences between employment measures is important for policymakers because alternative measures could lead to different assessments of current economic and labor market conditions. One way to assess the evolution of labor market conditions is to construct measures of labor demand and labor supply. Labor demand is defined as the sum of employed individuals (from the CPS survey) and the number of job vacancies from the Job Openings and Labor Turnover Survey (JOLTS). Labor supply is defined as the sum of employed and unemployed individuals (both from the CPS survey).

Using the currently published CPS measures of employment and unemployed individuals, the past two years have consisted of minimal growth in labor demand accompanied by modest growth in labor supply that has served to reduce the imbalance between demand and supply. Following the pandemic, a large gap emerged between elevated labor demand and constrained labor supply shown by the red area in figure 5. Following a rapid recovery and increase in labor demand in the second half of 2020 and throughout 2021, labor demand has been basically flat since early 2022. Since early 2022, the gap between demand and supply has been reduced primarily due to a gradual increase in labor supply.

Figure 5: Labor Demand versus Labor Supply Using Unadjusted CPS Data

Note: Data depict as three-month moving average. The region in green is the period where labor supply exceeds labor demand. The region in red is the period where labor demand exceeds labor supply.
Source: BLS Current Population Survey and Job Openings and Labor Turnover Survey (JOLTs)

Using an alternative measure of employment where the CPS employment measure is shifted upward to be consistent with the adjusted CES employment measure, the past two years have consisted of moderate growth in labor demand accompanied by rapid growth in labor supply. For this adjustment, the CPS employment measures is revised upward to match the adjusted CES employment measure described above in which we incorporate our estimate of the benchmark net birth-death contribution to employment. The measure of unemployed is adjusted using the assumption that the unemployment rate should match the published unemployment rate in the adjusted CPS data for employed and unemployed. The data on vacancies are unchanged from above. Using this alternative data, during the past two years labor demand has grown at a moderate pace following the rapid growth in the second half of 2020 and throughout 2021. The imbalance between labor demand and labor supply was reduced by strong growth of labor supply, to which net immigration has likely made a strong contribution (Edelberg and Watson 2024).

Figure 6: Labor Demand versus Labor Supply Using Adjusted CPS Data

Note: Data depict a three-month moving average. The region in green is the period where labor supply exceeds labor demand. The region in red is the period where labor demand exceeds labor supply.
Source: BLS Current Population Survey, Job Openings and Labor Turnover Survey (JOLTs), and authors' calculations

In comparing the two views of the labor market, the assessment using the adjusted CPS data (figure 6) points to a much more robust labor market experiencing moderate growth than under the view based on currently published CPS data, which suggests that labor demand has been stagnant over the past two years. Under the adjusted CPS view, solid growth in the labor supply has been a key contributor to the rebalancing of labor demand and labor supply. Further monitoring and analysis of these labor market dynamics going forward will be important to ensure that policymakers have the best understanding of labor market conditions.

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TECHNICAL APPENDIX TO
"WHAT ACCOUNTS FOR THE GROWING DIVERGENCE BETWEEN EMPLOYMENT MEASURES?"

JON WILLIS AND TAO ZHA

The Bureau of Labor Statistics (BLS) publishes the monthly Employment Situation Summary, which includes a key measure of job growth derived from the Current Employment Statistics (CES) survey. This survey covers a large sample of establishments to estimate employment changes. The CES survey, however, has a known limitation: it cannot fully capture the effects of business births (new businesses starting up) and business deaths (businesses closing down) on employment. To address this shortcoming, the BLS uses a statistical model called the "birth-death (BD) model" to gauge the net impact of these business dynamics.

Each year, the BLS revises its initial estimates by comparing them to more comprehensive data sources, primarily the Quarterly Census of Employment and Wages (QCEW). This process, called "BLS benchmarking," provides a more accurate picture of employment changes. After the benchmark revision, one can gain a clearer understanding of how many jobs were actually created or lost due to business births and deaths. The actual BD data after BLS benchmark is available only up to March 2023. The delayed release of actual BD data is always a problem. We propose a general approach to address the issue of delayed data releases. The BD model forecasts can be inaccurate, especially when estimating recent employment figures.

Alongside the BD publication, the BLS also publishes Business Employment Dynamics (BED) data. BED tracks employment changes at the establishment level (individual business locations) rather than the firm level. This data is derived from the QCEW, offering a more detailed view of establishment-level dynamics than the monthly CES survey used for the main employment report. BED reports gross job gains (from openings and expansions) and gross job losses (from closings and contractions), which together give a net change in employment.[1] Since business births and deaths in BD data are not directly observed in the CES survey, BED and BD series complement each other. BED data are quarterly and available up to 2023Q3, and we use the standard procedure to interpolate the monthly series up to September 2023 from this quarterly data.[2]

In addition to BD and BED publications by the BLS, the Federal Reserve Bank of Kansas City (KCF) publishes two monthly labor market conditions indicators (LMCIs) that track the overall health and momentum of the labor market:

- Level of Activity Indicator (KCFL): This measure assesses the current state of the labor market compared to its historical average. A positive value indicates that the labor market is performing above average, while a negative value signifies below-average conditions.
- Momentum Indicator (KCFM): This measure focuses on the rate of change in labor market conditions. A positive value suggests the labor market is improving, while a negative value indicates a slowdown.

These indicators are derived from a comprehensive analysis of 24 different labor market variables, including employment, unemployment, wages, hours worked, and job openings. By aggregating this diverse information, the LMCIs offer a holistic view of the labor market's overall health and trajectory.

Because all these monthly series are not seasonally adjusted, we follow common practice in the literature and use a 12-month moving average. We denote the BD model forecast series by ΔF_t^{BD}, where F_t represents the forecast for month t and Δ is the difference operator, so that ΔF_t^{BD} represents a monthly change in employment. Our goal is to leverage other information and estimate the actual BD series from April 2023 to June 2024, denoted by ΔE_t^{BD}, where "E" stands for employment. The information we use to obtain ΔE_t^{BD} from April 2023 to June 2024 includes the BED series from November 2021 to September 2023, KCFL and KCFM from from November 2021 to June 2024, using the multivariate conditional forecasting approach of Waggoner and Zha (1999).[3] The difference $\nu_t = \Delta E_t^{\text{BD}} - \Delta F_t^{\text{BD}}$ captures the potential error associated with using ΔF_t^{BD} as an estimate from April 2023 to June 2024.

We use this error series ν_t to adjust the nonfarm payroll employment. Let E_t^{CES} be the level series for the CES survey. We calculate a 12-month moving average of monthly changes ΔE_t^{CES}, denoted by $\Delta \bar{E}_t^{\text{CES}}$. For April 2023 to June 2024, we adjust this monthly series as

$$\Delta \widehat{E}_t^{\text{CES}} = \Delta \bar{E}_t^{\text{CES}} + \nu_t,$$

and subsequently convert this 12-month moving average series to monthly changes according to the formula[4]

$$\Delta \widetilde{E}_t^{\text{CES}} = 12\Delta \widehat{E}_t^{\text{CES}} - \Delta \widetilde{E}_{t-1}^{\text{CES}} - \ldots - \Delta \widetilde{E}_{t-11}^{\text{CES}}.$$

In a final step, we transform the series of monthly changes $\Delta \widetilde{E}_t^{\text{CES}}$ to the level series $\widetilde{E}_t^{\text{CES}}$ so that

$$\widetilde{E}_t^{\text{CES}} = E_t^{\text{CES}} + \varepsilon_t.$$

Note that $\widetilde{E}_t^{\text{CES}}$ differs from E_t^{CES} only for the period from April 2023 to June 2024, and ε_t is an error accumulated from ν_t.

Over the past year, a growing discrepancy has emerged between CES estimates (based on jobs reported by firms) and household survey estimates (based on the Current Population Survey, or CPS), denoted by

$$\widetilde{E}_t^{\text{CPS}} = E_t^{\text{CPS}} + u_t,$$

where u_t is the household survey measurement error. We assume $\widetilde{E}_t^{\text{CES}} = \widetilde{E}_t^{\text{CPS}}$. Thus, the discrepancy between the two employment measures is

$$E_t^{\text{CES}} - E_t^{\text{CPS}} = -\varepsilon_t + u_t.$$

The unexplained employment divergence, u_t, may be partly due to an underestimation of population growth in the CPS caused by significant fluctuations in immigration flows.

NOTES

[1]It also provides data on establishment births and deaths, which are subsets of openings and closings.

[2]Given that quarterly data is the average of the three months within the quarter, we treat it as an approximation of the middle month's value. To derive a monthly series, we employ cubic spline interpolation, a technique that generates smooth curves connecting data points. Subsequently, the middle month's value is fine-tuned to guarantee that the average of the three-month data equals the original quarterly value.

[3]D. Waggoner and T. Zha, "Conditional Forecasts in Dynamic Multivariate Models," *The Review of Economics and Statistics*, 81(4), November 1999, pages 639–651.

[4]For the months prior to April 2023, $\Delta \widetilde{E}_t^{\mathrm{CES}} = \Delta E_t^{\mathrm{CES}}$.

FEDERAL RESERVE BANK OF ATLANTA