US Employment: Breakevens, Benchmarking and Blindspots

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An impossible question

- **"[The breakeven is]... somewhere between 0 and 50k and you'd be right, or wrong."**. Chair Jerome Powell, FOMC Press Conference, September 2025.
- By November 2025 the Fed faced a labour market in flux:
  - Migration patterns were thought to have distorted the breakeven.
  - Next benchmark revision was expected to lower 2024 payrolls by approximately **900k** jobs.
  - The federal government shutdown had delayed the official BLS employment report.
- Without an idea of the balance between supply and demand, with revisions of historic magnitude, and without official data, what do we know about the US labour market in real-time?

What this paper does, and what we find

- Introduce a unified framework to answer three questions about the US labour market:
  1. What rate of employment growth keeps unemployment stable?
     - Falling fast to c. +50k jobs/month as net migration normalises.
  2. How much will the BLS benchmark revision adjust employment?
     - Around half the 2024 initial estimate, less than canonical models predicted.
  3. What did the labour market do during the shutdown?
     - Continued softening (-138k jobs/month in Oct and U3 at 4.7%).
- A state-space model which embeds the **institutional structure** of US employment data through **vintages**, the QCEW administrative **anchor**, and the persistent CES to QCEW **wedge**.

Outline

- Employment Data and Revisions
- Model
- Results
- Applications

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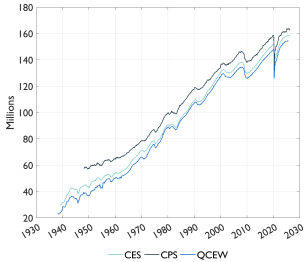
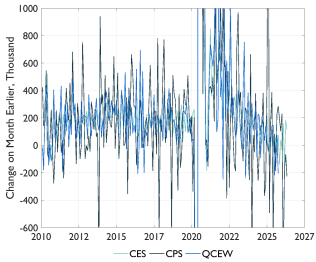
Large disagreements in employment series

- Three series share trend (cointegrated), but very volatile on monthly basis.
- QCEW: 10 million establishments; CES: 666,000 establishments; CPS: 60,000 households.

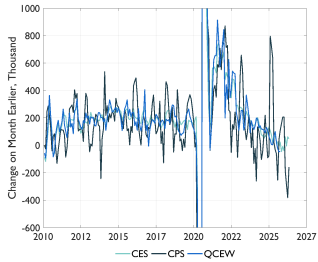
(a) US Employment Level



(b) 1 Month Change



(c) 3 Month Change

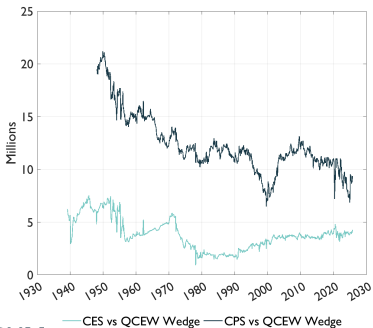


Sources: Fulcrum Asset Management LLP, BLS and Haver Analytics. Figure shows level and change in US employment according to alternative measures. QCEW uses the definitional adjustments as discussed in the main text. May 11, 2026.

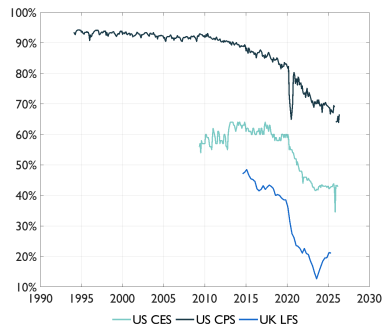
Wedges and responses

- Survey wedges (levels differences) are persistent, reflecting definitional differences, although magnitude has varied over time.
- Recent collection challenges reduced CES (CPS) response rates from 60% (90%) to 45% (70%).

(a) US Employment Survey Wedge



(b) Employment Survey Response Rates

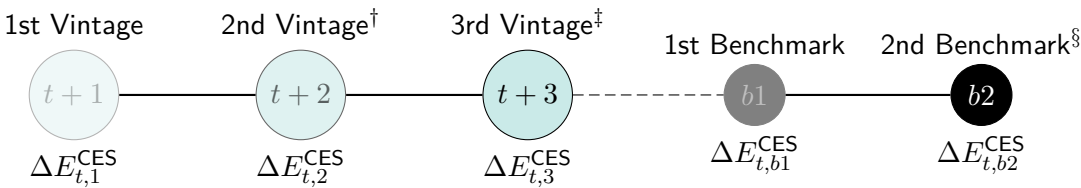


Sources: Fulcrum Asset Management LLP, BLS and Haver Analytics. May 11, 2026.

Employment revisions process

- The household survey (CPS) is revised once for an annual census update.
- Non-farm payrolls (CES) are revised multiple times. In the first three months this reflects additional survey responses, before later revisions reflect the benchmarking process.

Notation and Current Employment Statistics Revisions Process

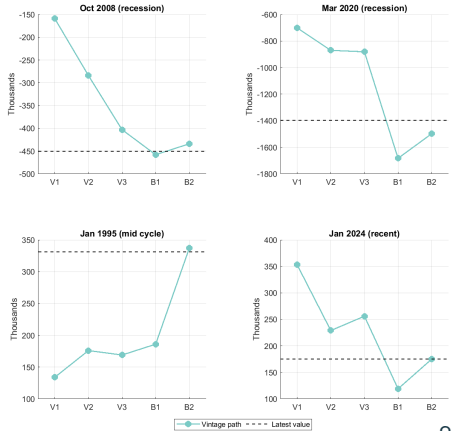


Source: Fulcrum Asset Management LLP. May 11, 2026. Notes: Figure shows a graphical representation of the vintage structure in the Current Employment Statistics Survey. †First revision. ‡Second revision. §Non-seasonally adjusted data in January, February and March do not undergo a second benchmark revision. Text within circles represents the release dates.

CES revisions are systematic, not noise

1. V1 RMSE 100k vs eventual benchmark, same order as the typical monthly change.
2. Bias is state-dependent (-20k in expansions; +15k in recessions).
3. Noise share is state-dependent (16% in expansions; 44% in recessions).
4. Cumulative wedge between V1 and benchmark runs to millions of jobs over a decade.
5. Revisions are predictable ($R^2 = 0.16$ from a regression on lags + recession dummy).

Successive Vintages of Monthly CES Change



Source: Fulcrum Asset Management LLP. May 11, 2026.

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Three identification layers

- **QCEW** jointly anchors trend & cycle. Administrative coverage of around 10m establishments. Released annually with 6-month lag. Anchors low-frequency total employment.
- **CES** to **QCEW** co-integration identifies the benchmarking wedge w_t. CES is mechanically aligned to QCEW each March. Outside benchmark dates, the gap is the persistent definitional/coverage wedge.
- **Cyclical indicators** (U3, JOLTS, ISM etc.) discipline trend vs cycle. Enter only through the cycle. Shared low-frequency comovement with employment goes into trend, not cycle.

Explicit Form: Observation Equations I

- The observed employment levels (of differing survey and vintages) are the sum of a trend and a cyclical component, starting with the employment measurement error block:

$$
\begin{aligned}
E_{t,2}^{\mathsf{QCEW}} &= E_t^{\mathsf{T}} + E_t^{\mathsf{C}}, \\
E_{t,1}^{\mathsf{QCEW}} &= E_t^{\mathsf{T}} + E_t^{\mathsf{C}} + \tilde{\eta}_{t,1}, \\
E_{t,B}^{\mathsf{CES}} &= E_t^{\mathsf{T}} + E_t^{\mathsf{C}} + w_t, \\
E_{t,3}^{\mathsf{CES}} &= E_t^{\mathsf{T}} + E_t^{\mathsf{C}} + w_t + \tilde{\eta}_{t,2}, \\
E_{t,2}^{\mathsf{CES}} &= E_t^{\mathsf{T}} + E_t^{\mathsf{C}} + w_t + \tilde{\eta}_{t,2} + \tilde{\eta}_{t,3}, \\
E_{t,1}^{\mathsf{CES}} &= E_t^{\mathsf{T}} + E_t^{\mathsf{C}} + w_t + \tilde{\eta}_{t,2} + \tilde{\eta}_{t,3} + \tilde{\eta}_{t,4}, \\
E_{t,1}^{\mathsf{CPS}} &= E_t^{\mathsf{T}} + E_t^{\mathsf{C}} + w_t + \tilde{\eta}_{t,5}, \\
E_{t,1}^{\mathsf{ADP}} &= E_t^{\mathsf{T}} + E_t^{\mathsf{C}} + w_t + \tilde{\eta}_{t,6}
\end{aligned}
$$

- Where $E_{t,1}^{\mathsf{CES}}$ refers to the level of non-farm employment, $E_{t,1}^{\mathsf{QCEW}}$ refers to the QCEW, and $E_{t,1}^{\mathsf{CPS}}$ refers to the household survey. w_t is a QCEW wedge and $\tilde{\eta}_{t,i}$ are persistent measurement errors.

Explicit Form: Observation Equations II

- To improve identification of the cyclical employment component, we incorporate additional labour market indicators, denoted Z_t^i.
- These include both official variables, such as the monthly unemployment rate, and unofficial data, such as the employment subcomponent of the ISM index.
- Each of these variables load on the cyclical component according to:

$$Z_t^i = a^i + \sum_{j=0}^{k} \lambda_j^i E_{t-j}^{\mathsf{C}} + \eta_t^i.$$

where $k \geq 1$ represents the number of lags in the system.

Explicit Form: State Equations

- The unobserved components evolve according to standard stochastic processes.
- Trend employment follows a local-linear trend (allows for migration dynamics), while the cyclical component is persistent:

$$
\begin{aligned}
E_t^{\mathsf{T}} &= \mu_{t-1} + E_{t-1}^{\mathsf{T}} + \epsilon_{t,1}, \\
\mu_t &= \mu_{t-1} + \epsilon_{t,2}, \\
E_t^{\mathsf{C}} &= \beta_3 E_{t-1}^{\mathsf{C}} + \epsilon_{t,3}, \\
w_t &= \alpha_4 + w_{t-1} + \epsilon_{t,4}, \\
\tilde{\eta}_{t,j} &= \alpha_{j+4} + \beta_{j+4}\tilde{\eta}_{t-1,j} + \epsilon_{t,j+4},
\end{aligned}
$$

- Measurement errors are (potentially) persistent processes.

Compact Form: Observation and State Equations

- The measurement equation and state equation can respectively be written in matrix companion form as:

$$\mathbf{Y}_t = \mathbf{A} + \mathbf{H}\mathbf{X}_t + \eta_t,$$
$$\mathbf{X}_t = \mathbf{D} + \mathbf{F}\mathbf{X}_{t-1} + \epsilon_t,$$

- where:

$$\mathbf{Y}_t = \begin{bmatrix} E_{t,2}^{\text{QCEW}} & E_{t,1}^{\text{QCEW}} & E_{t,B}^{\text{CES}} & E_{t,3}^{\text{CES}} & E_{t,2}^{\text{CES}} & E_{t,1}^{\text{CES}} & E_{t,1}^{\text{CPS}} & E_{t,1}^{\text{ADP}} & Z_t^{\text{U3}} & Z_t^{\text{ISM}} & Z_t^{\text{Quits}} & \cdots \end{bmatrix}',$$
$$\mathbf{X}_t = \begin{bmatrix} E_t^{\text{T}} & \mu_t & E_t^{\text{C}} & w_t & \tilde{\eta}_{t,1} \cdots \tilde{\eta}_{t,6} & E_{t-1}^{\text{C}} \cdots E_{t-k}^{\text{C}} \end{bmatrix}',$$

Compact Form: Matrix Restrictions I

- Matrices $\mathbf{A}$, $\mathbf{H}$, $\mathbf{D}$, and $\mathbf{F}$ impose restrictions implied by observation and state equations.
- The observation equation intercept vector, $\mathbf{A}$, is of size $n \times 1$, with the first 8 elements restricted to 0, and remainder unconstrained representing the a^i components.
- The state equation intercept vector, $\mathbf{D}$, is of size $(10 + k) \times 1$, and restricted to be zero except for positions 5 to 10.

Compact Form: Matrix Restrictions II

- Observation loading matrix, $\mathbf{H}$, is partitioned into: (i) **employment indicators**, $\mathbf{H}^{\text{EI}}$, linking survey vintages; above (ii) **cyclical influence**, $\mathbf{H}^{\text{CI}}$, linking auxiliary indicators to the cyclical employment components:

$$\mathbf{H} = \begin{bmatrix} \mathbf{H}^{\text{EI}} \\ \mathbf{H}^{\text{CI}} \end{bmatrix} \quad \text{with} \quad \mathbf{H}^{\text{CI}} = \begin{bmatrix} \mathbf{0}_{n_z \times 2} & \boldsymbol{\lambda}^0_{n_z \times 1} & \mathbf{0}_{n_z \times 7} & \boldsymbol{\Lambda}_{n_z \times k} \end{bmatrix},$$

$$\mathbf{H}^{\text{EI}} = \begin{bmatrix} 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & 0 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix} \quad \mathbf{0}_{n-n_z \times k}$$

- where $\boldsymbol{\lambda}^0_{n_z \times 1}$ and $\boldsymbol{\Lambda}_{n_z \times k}$ are matrices containing contemporaneous and lagged λ^i_j entries.

Compact Form: Matrix Restrictions III

- Similarly, state equation loading matrix, $\mathbf{F}$, is partitioned into the components which incorporate three blocks: (i) a **trend definition** block, $\mathbf{F}^{\mathsf{TD}}$; (ii) a **measurement error** block, $\mathbf{F}^{\mathsf{ME}}$; and (iii) a **cyclical influence** block, $\mathbf{F}^{\mathsf{CI}}$ where lags of the employment cycle are identified:

$$\mathbf{F} = \begin{bmatrix} \mathbf{F}^{\mathsf{TD}} \\ \mathbf{F}^{\mathsf{ME}} \\ \mathbf{F}^{\mathsf{CI}} \end{bmatrix}$$

$$\mathbf{F}^{\mathsf{TD}} = \begin{bmatrix} 1 & 1 & 0 & 0 & \\ 0 & 1 & 0 & 0 & \\ 0 & 0 & \beta_3 & 0 & \mathbf{0}_{4\times(6+k)} \\ 0 & 0 & 0 & 1 & \end{bmatrix}$$

$$\mathbf{F}^{\mathsf{ME}} = \begin{bmatrix} \mathbf{0}_{6\times 4} & \mathsf{diag}\{\beta_5 \cdots \beta_{10}\} & \mathbf{0}_{6\times k} \end{bmatrix}$$

$$\mathbf{F}^{\mathsf{CI}} = \begin{bmatrix} \mathbf{0}_{k\times 10} & \mathbf{I}_k \end{bmatrix}$$

Compact Form: Error Processes

- The observation error processes, $\eta_t \overset{\text{iid}}{\sim} N(\mathbf{0}, \mathbf{R})$:
- While the state equation errors $\epsilon_t \overset{\text{iid}}{\sim} t(\mathbf{Q})$.
- $\mathbf{R}$ and $\mathbf{Q}$ denote the covariance matrices of observation and state errors, respectively. Both matrices $\mathbf{R}$ and $\mathbf{Q}$ are diagonal.
- There are no fat tails assumed in the first two states.
- The use of a Student t-distribution for $\boldsymbol{\epsilon}_t$ allows for occasional large innovations to accommodate occasional large employment shocks. These arose in the aftermath of the Global Financial Crisis and the COVID-19 pandemic. In both instances monthly change in employment exhibited extreme movements that are difficult to reconcile with Gaussian innovations without inflating unconditional variance estimates.

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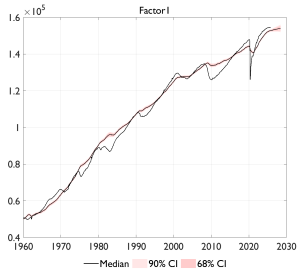
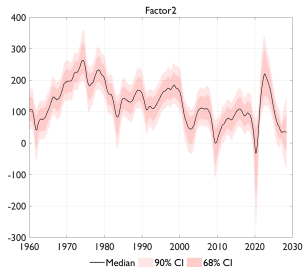
Model Estimates

- Trend closely tracks the QCEW benchmark series over the sample period
- But clear moderation in recent months as the pace of trend employment growth has declined well below 100k per month as the 2023/24 migration boost has faded.
- Cyclical factor remains mildly positive, gradually fading and is now close to neutral.

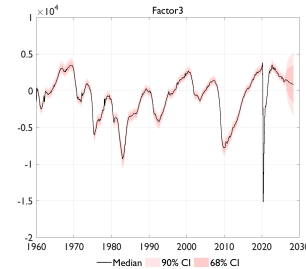
(a) Employment Trend



(b) Δ Employment Trend



(c) Cycle



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Source: Fulcrum Asset Management LLP. Figure shows: in panel (a) the employment trend alongside QCEW latest data; in panel (b) the change in the employment trend; and in panel (c) the uncovered employment cycle. May 11, 2026.

Optimal Smoother Weights

- Smoother places essentially all weight on the most recent CES release.
- CPS enters with a relatively small but stable weight.
- After first QCEW vintage (c. 8 mths after ref date), less weight on the CES/CPS/ADP.

Optimal Smoother Weights on CES and CPS Vintages

Offset	QCEW V1	CES V1	CES V2	CES V3	CES BMK	CPS	ADP	Sum
$t^* + 1$		0.55				0.18	0.02	0.75
$t^* + 2$		-0.00	0.57			0.18	0.02	0.77
$t^* + 3$		0.00	0.00	0.69		0.13	0.01	0.83
$t^* + 8$	0.23	0.00	0.00	0.59		0.11	0.01	0.95
$t^* + 13$	0.00	0.00	0.00	0.00	1.00	-0.00	-0.00	1.00
$t^* + 24$	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00

Source and Notes: Fulcrum Asset Management LLP. Table reports the share of each vintage's content that the optimal Kalman smoother attributes to underlying employment (Trend + Cycle + Wedge) at the reference month t^* taken here to be January 2011. Weights are computed by perturbing each vintage by a fixed amount and recording the change in the smoothed signal at t^*, divided by the perturbation size. Parameters are fixed at their posterior means. A weight of 1 indicates the smoother treats that vintage as a noiseless reading of underlying employment; a weight of 0 indicates it provides no incremental information given the other vintages already observed. Empty entries indicate the vintage has not yet been released at that stage. May 11, 2026.

Optimal Smoother Weights II

- Corresponding impact weights of auxiliary indicators quantify their roles.
- Each assists with identifying cyclical state at t^* in the absence of benchmark anchored employment data.

Optimal Smoother Weights on Cyclical Component from Auxiliary Indicators

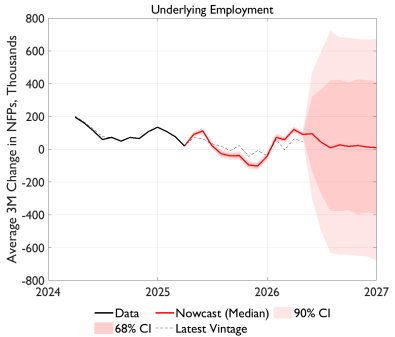
Offset	U3	U6	Quits Rate	Layoff Rate
$t^* + 1$	-322	-109		
$t^* + 2$	-245	-83	50	-23
$t^* + 3$	-210	-71	43	-20
$t^* + 8$	-185	-63	37	-18
$t^* + 13$	-184	-62	37	-18
$t^* + 24$	-184	-62	37	-18

Sources and Notes: Fulcrum Asset Management LLP. Table reports the change in the smoothed estimate of the cyclical component of employment $E^C_{t^*}$ in response to a one-unit perturbation in selected auxiliary indicators at the reference month t^* taken here to be January 2011. Parameters are fixed at their posterior means. The unemployment rate (U3) and underemployment rate (U6) are enter with negative sign because higher unemployment is associated with weaker cyclical employment. Empty entries indicate the vintage has not yet been released at that stage. May 11, 2026.

Underlying employment growth

- Median posterior estimates over-estimation to mid-2025 and under-estimation subsequently.
- Latest data show a pick-up which fades in coming year.

Change in Underlying Employment, $\Delta^3 E^{\text{CES}}_{t,B}$



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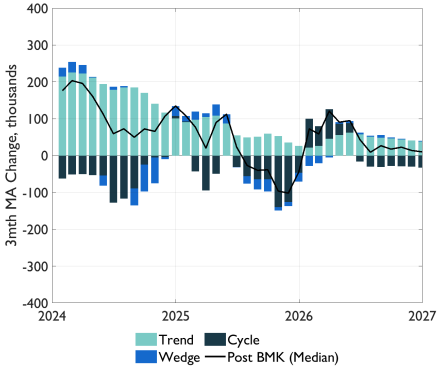
Source and Notes: Fulcrum Asset Management LLP. Figure plots the median posterior estimates and credible intervals derived from the state space model. The dotted series in panels (a) and (b) indicate the latest vintage of the data. May 11, 2026.

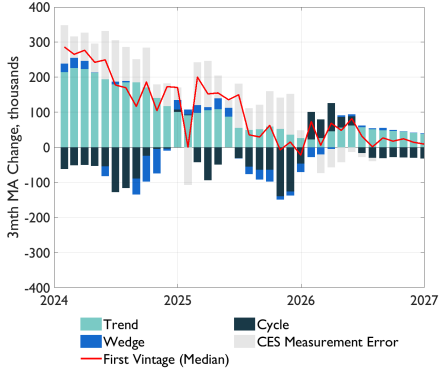
Employment decompositions

- Slowing trend and normalising cycle both weight on employment projections.

(a) Underlying Employment Change, $\Delta^3 E^{\text{CES}}_{t,B}$



(b) First Vintage Employment Change, $\Delta^3 E^{\text{CES}}_{t,1}$

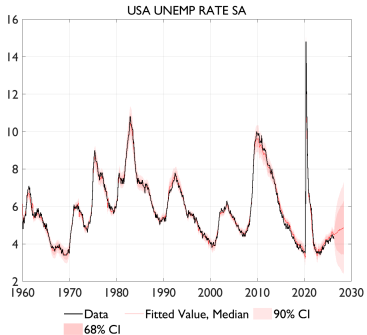


Source and Notes: Fulcrum Asset Management LLP. Figure plots the median posterior estimates derived from the state space model. May 11, 2026.

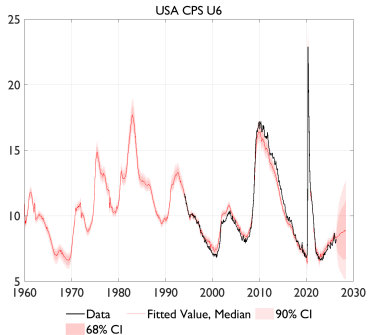
Unemployment projections

- Model also implies an increase in labour market slack over the coming year.
- Similar deterioration in broader measure of labour market slack.

(a) Unemployment Fitted Value, $U3$



(b) Underemployment Fitted Value, $U6$



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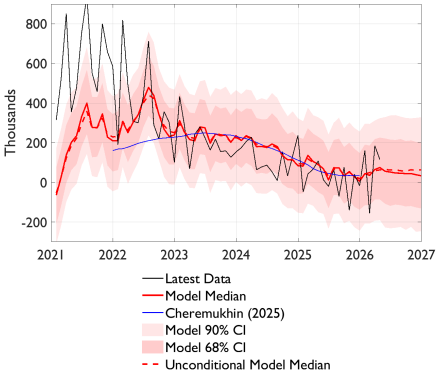
Q1: US employment breakeven estimates of 50k

- Fallen from 100k in mid-2025 to 50k, driven by net migration normalisation.
- Definition via labour-force identity and in model equivalent to stable cycle:

$$\Delta E^{\text{BE}} \approx PR \cdot \Delta Pop \cdot (1-u) \Rightarrow \mathbb{E}_t[\Delta E^T_{t+1} + \Delta w_{t+1}]$$

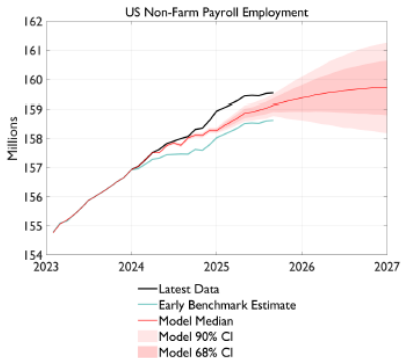


Source and Notes: Fulcrum Asset Management LLP, BLS, Haver Analytics and Cheremukhin (2025). Figure shows the latest vintage of one-month changes in CES employment alongside estimates of the employment breakeven. May 11, 2026.

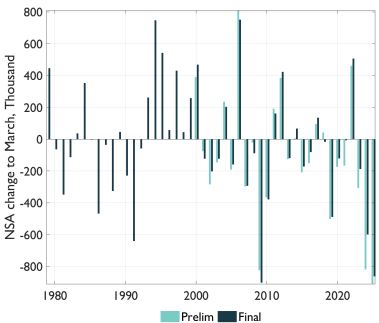
Q2: Continually updated benchmarking estimates

- BLS Mar 2025 preliminary benchmark of -911k, our model closer to -800k in Sep 2025.
- Final revision was -861k.

(a) Sep 2025 Benchmark Revision Estimates



(b) Benchmark Revision Outturns



Source: Fulcrum Asset Management LLP. May 11, 2026.

Q3: Real-time inference in 2025 shutdown

- By end-Nov, model's Oct estimate (-138k) matched the eventual BLS print exactly, using available indicators (ADP, ISM, claims).
- Materially weaker current view of Sep/Oct than published vintages: a forecast of further downward revisions.

Real-Time Model Estimates Through the 2025 Federal Government Shutdown

	Pseudo-real-time model estimate			
Reference month	End-Oct 2025	End-Nov 2025	Current	Latest data
Panel A: CES employment, 1-month change (BMK basis), thousands				
Sep 2025	-200	-202	-193	86
Oct 2025	79	-138	-162	-138
Nov 2025	134	152	50	64
Dec 2025	128	118	-20	-26
Panel B: Unemployment rate (U3), per cent				
Sep 2025	4.7	4.7	4.6	4.4
Oct 2025	4.8	4.9	4.7	TBD
Nov 2025	4.8	4.9	4.6	4.5
Dec 2025	4.8	4.9	4.6	4.4

Source: Fulcrum Asset Management LLP, May 11, 2026.

Takeaways

- **Methodology** embedding the institutional data structure (vintages, QCEW anchor, CES/QCEW wedge) directly into the state space treats revisions as a feature, not a nuisance.
- **Empiric** show US underlying employment growth close to the 50k jobs/month breakeven on an underlying basis.
- **Practically**, this framework remained operational even in absence of official data due to the the 2025 federal government shutdown.

An impossible question

- **"[The breakeven is]... somewhere between 0 and 50k and you'd be right, or wrong"**. Chair Jerome Powell, FOMC Press Conference, September 2025.
- Our framework says: a breakeven close to 50k, with predictable revisions and ability to smooth through blindspots.
- Thank you. Questions?

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Literature

- The most closely related paper is Goto et al. (2023), which combines CES and CPS surveys to construct an underlying employment factor. They suggest minimal weight placed on the CPS.
- But, their process assumes all error processes are non-stochastic white noise, an inappropriate simplification which omits valuable information about CPS revisions. They also overlook the co-integrating relationship between the CES and QCEW, established during the annual benchmarking process.
- Wu (2004) discusses the differences between the CES and CPS employment surveys in the context of recovery from the 2001 US recession.
- Additional relevant contributions include data revisions models (Berger and Phillips, 1993; Brave et al., 2021) and breakeven topics (Bick, 2025; Bidder et al., 2016; Gregory and Bick, 2025; Petrosky-Nadeau and Stewart, 2024)