

How to Use Alternative Data to Understand the Labor Market

Key Takeaways:

- The Labor Market is one of the main pillars of business cycle macro, and a deep understanding of it enables policy and investment decisions.
- MacroX's engine is able to produce a wage-growth measure with a longer history (back to 2004 vs. 2019) and a stronger statistical performance than other alternative datasets when explaining the Fed's preferred—though lagged—wage metric, the Employment Cost Index (ECI).
- In this piece, we explain how MacroX achieves these results - by pursuing a strategy of “data diversification” coupled with deep domain expertise, we provide a comprehensive and statistically superior view of the labor market.
- This provides decision-makers with a deeper, more reliable understanding of the labor market than they would obtain from lagged, frequently revised government data (see our previous blog) or from real-time alternative datasets that capture only a narrow segment of the workforce.

In the second in a series of deep understanding about the US labor market, MacroX deep-dives into the alternative data based measures of the labor market. We discuss why most alternative data measures of the labor market lack comprehensive coverage of the labor market, why MacroX's approach leads to a more holistic view and that it statistically dominates when explaining the variation in government data.

Understanding wage growth is a crucial piece of a deep understanding of the economy

Wage pressures are a crucial labor market variable - particularly in times of elevated inflation, as we've seen in the post-pandemic period. Fed Chair Powell, [in a 2022 speech](#), remarked that nonhousing services “may be the most important category for understanding the future evolution of core inflation,” and that “wages make up the largest cost of delivering services” and therefore “the labor market holds the key to understanding inflation in this category”.

The Fed's preferred measure of wage growth is the Employment Cost Index, but, unfortunately for the Fed, this is only published quarterly - hence the ECI for Q4 2025 will only be released at the end of

January 2026! Hence, a more timely but accurate measure of wage growth would be extremely useful. Numerous more real-time, alternative data measures of wage growth exist, including the [Indeed Wage Tracker](#), [ADP Pay Insights](#), and [Revelio Labs](#) salary data. Both Indeed and Revelio Labs seem to use salary data from job postings to measure wages, while ADP uses its payroll database to measure wage growth.

The 3M Faster and Most Significant Wage Measure: How does MacroX do it?

MacroX also measures wage growth using its multimodal AI engine. And instead of relying on a single alternative data source (e.g., job postings), it draws on multiple data types (described below) to measure the net bargaining power of workers and

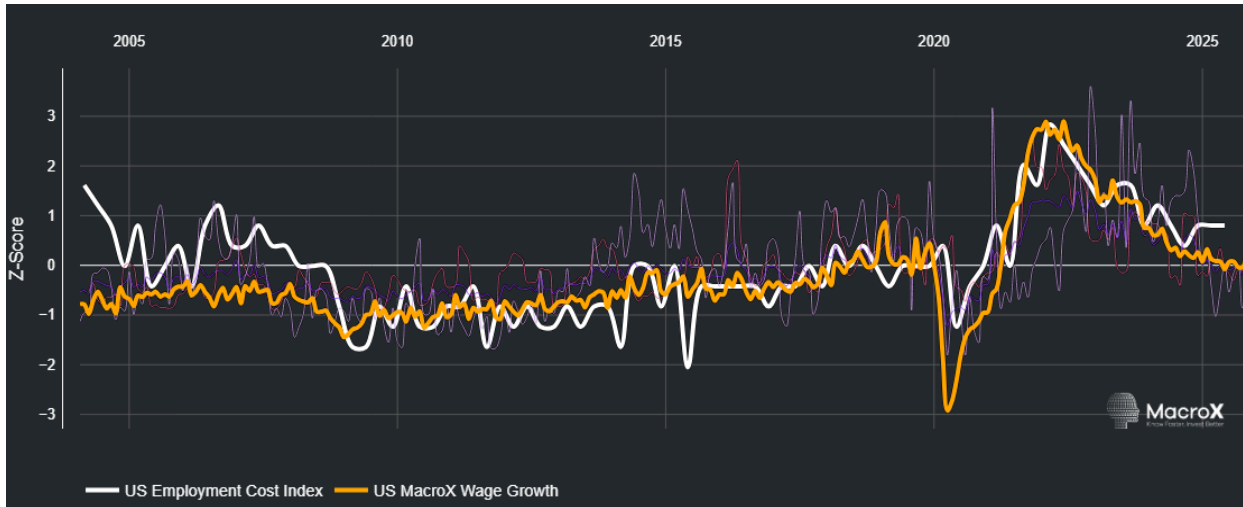


Fig 1: MacroX's measure of wage growth tracks the Employment Cost Index well and is available in real-time - about 6 weeks to 3 months ahead of the quarterly ECI.

employers—ultimately mapping that balance to wage pressures. Crucially, MacroX's approach means that our measure is available monthly from January 2004, which is a much longer time history than the other providers mentioned.

We first test statistically whether MacroX's measure of wage pressures is statistically significant in explaining the variation in the ECI from 2004 to today, even after controlling for its previous value. After confirming it is statistically significant, we run simple horse-race regressions and find that our measure statistically outperforms all other indicators in explaining variation in the Employment Cost Index.

	Model 1 (2004-)	Model 2 (2019-)	Model 3 (2020-)	Model 4 (2022-)
Intercept	0.41*** 6.26	0.77*** (5.23)	1.02*** (4.92)	0.91*** (3.12)
ECI QoQ(t-1)	0.45*** (5.25)	-0.01 (-0.10)	-0.51** (-2.18)	-0.07 (-0.20)
MacroX Wage Pressures(t)	0.11*** (5.09)	0.13*** (3.58)	0.15** (2.49)	0.16** (2.34)
Indeed Wage Tracker(t)		1.77 (1.03)		
ADP Pay Insights(t)			0.06 (1.26)	
Revelio Wage Growth QoQ(t)				-0.84 (-0.94)
Observations	85	25	18	13
R ²	68%	81%	76%	86%

Employment Cost Index QoQ(t) ~ Constant + MacroX Labor Nowcast(t) + Alternative Wage Tracker(t) + Employment Cost Index QoQ(t-1)

Table 1: MacroX is statistically significant when explaining the variation in the Employment Cost Index from 2004 to present. Furthermore, when doing horse race regressions for the period in which Indeed (2019-), ADP (2020-) and Revelio (2022-) data is available, MacroX's measure of wage pressure statistically dominates each provider.

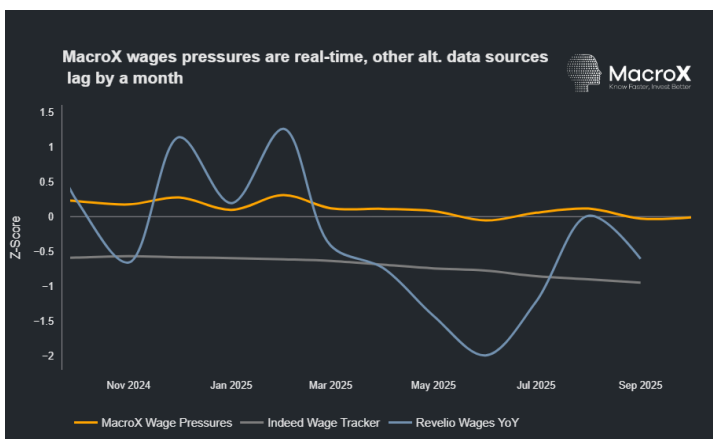
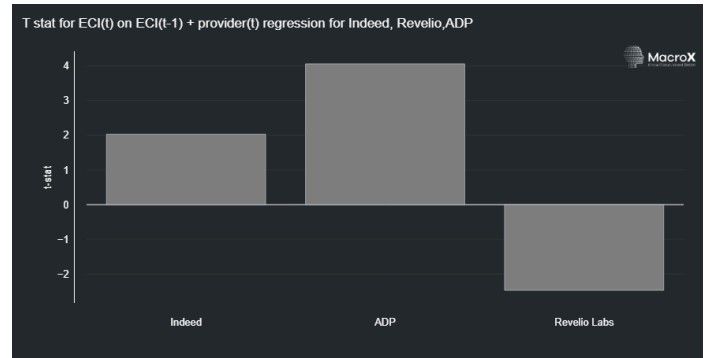
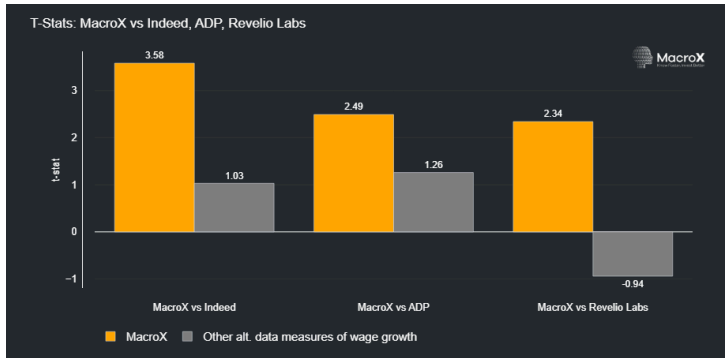


Fig 2: MacroX's measure of wage growth is also released ~1 month ahead of other alternative data providers such as Indeed or Revelio Labs which are produced with a 1m lag



Figs: Alternative data sources are generally quite good at explaining the variation in the ECI (both Indeed and ADP are statistically significant in AR(1) regressions) but MacroX’s measure of wages dominates them in horse race regressions (as shown by higher t-stats)

Because 2020 and 2021 were unusually turbulent for the labor market, a reasonable critique is that the significance in the regression table could simply reflect those extreme shocks. However, when we rerun the regression excluding 2020 and 2021, the results are essentially unchanged—MacroX’s variable remains significant at the 1% level in explaining ECI variation. Moreover, MacroX’s wage pressure measure also predicts future movements in the Employment Cost Index, remaining statistically significant in regressions using next quarter’s ECI.

MacroX’s measure remains statistically significant even when taking out the pandemic years (2020 and 2021) and can also explain future variation in the ECI.

The Labor Market: Major pillar for understanding the economy

The labor market comprises the interactions among employers, employees, and job seekers that determine employment, unemployment, and wages. Because of this, the health of the labor market is directly tied to the health of the overall economy - a weak labor market, characterised by high unemployment and sluggish wage growth, will mean other macroeconomic outcomes, e.g., economic growth is also weak. This underpins the Federal Reserve’s well-known dual mandate, which focuses on both low and stable inflation and “maximum employment.” As a result, precise labor-market measurement is crucial for understanding the broader economy.

Table 12: ECI: Excluding 2020 + 2021

	Model 1
Intercept	0.37*** (5.46)
ECI(t-1)	0.49*** (5.54)
MacroX Wage Pressures(t)	0.11*** (4.32)
Observations	77
R ²	71%

Table 12: ECI (t+1)

	Model 1
Intercept	0.42*** (6.26)
ECI(t-1)	0.44*** (5.06)
MacroX Wage Pressures(t)	0.11*** (5.02)
Observations	84
R ²	67%

Table 2: MacroX’s measure remains statistically significant even when taking out the pandemic years (2020 and 2021) and can also explain future variation in the ECI.

Government macro data measures this complex system reasonably well, but it is often revised and typically lagged

By definition, the labor market includes every single worker and employer in an economy. A market of this scale is impossible to understand using just one metric, which is why economists typically use multiple metrics to form their understanding of the labor market. Most countries release data on standard labor-market measures like employment, unemployment, and wages. However, these measures are typically measures of “stocks” in the labor market, but commentators are also interested in “flows” between these “stocks”. The United States, as is frequently the case, is a global leader in labor-market data and monitors labor “flows” via the monthly Job Openings and Labor Turnover Survey (JOLTS). This coverage is sadly lacking in other countries.

The Atlanta Fed spider diagram clearly maps key labor-market elements and the official data used to track them.

Unfortunately, as we mentioned in our previous blog, these various measures of the labor market are published with a lag and can be subject to large revisions (particularly around turning points in the economic cycle).

Current popular alternative data measures of the labor market typically rely on one source of data (e.g, job postings), which measures one aspect of the labor market

Alternative data, on the other hand, is often available in real-time and is subject to much lower revisions. The recent government shutdown - and the related inability of statistical agencies to produce macroeconomic data - has only increased the focus on alternative data-based measurement of the labor market, with firms like ADP, LinkedIn, Revelio Labs, and Indeed all producing free and valuable insights from their proprietary data. However, as the diagram below shows, comprehensive alternative data coverage remains elusive.



Fig 5: The Atlanta Fed spider chart shows how a comprehensive view of the labor market requires coverage of many different aspects of the labor market. Source: [AtlantaFed](#)

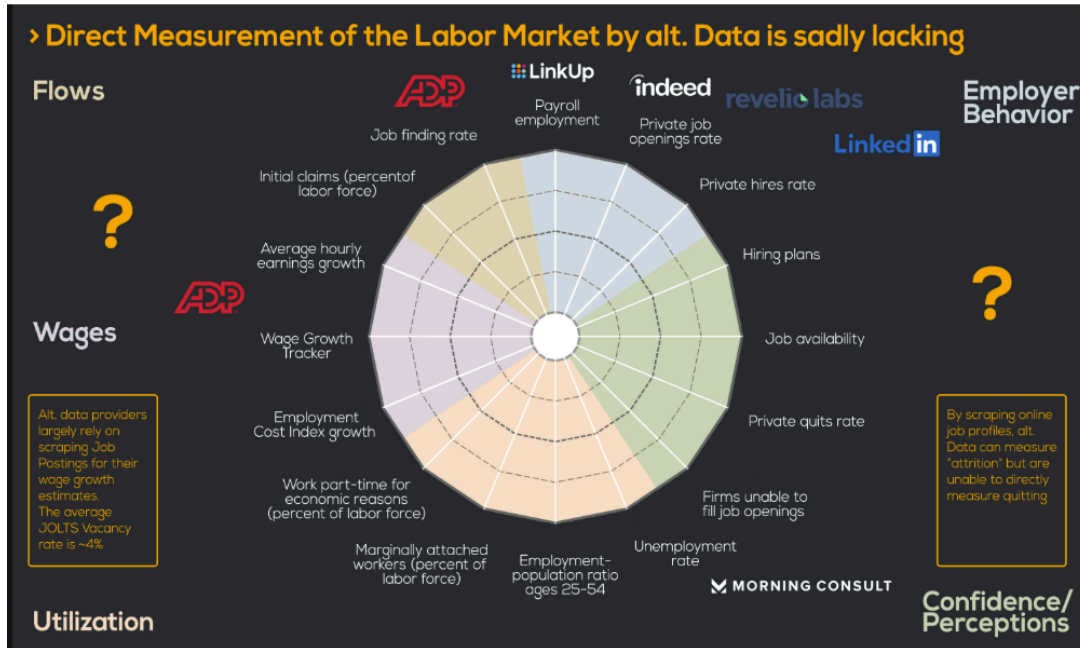


Fig 6: Popular alternative data providers such as Indeed or Revelio are very good at measuring particular aspects of the labor market. However, a comprehensive measurement of the labor market is beyond them. Source: [AtlantaFed](#) + MacroX labelling

Alternative data providers such as LinkUp, RevelioLabs and Indeed are extremely dependent on online job postings for their measurement of the labor market. This means they are excellent at measuring job vacancies but much less good at nowcasting other aspects of the labor market. Although, they can provide inferences on hiring and wages based on job postings data but the only variable they directly measure is vacancies.

Furthermore, although online job postings often provide salary information which can provide insights into trends in wage growth, these job postings are a very small part of the workforce. Since 2004-, the JOLTS Vacancy rate has been around 4% i.e. the number of vacancies is just over 4% of the number of employees in the economy. This is a very small sample of the labor market and is likely biased by not having access to data on existing employees. Hence relying on data from job postings to make inferences on the state of wage growth in the overall economy seems risky.

Alternative data measures of labor market “slack” are also sadly lacking

At the recent NABE annual meeting, MacroX participated in a panel with several alternative data providers. A key point raised was that while these data sources provide good coverage of hiring, they are less reliable for measuring economic slack, including layoffs and unemployment. This highlights the risk of relying on a single data source— for example, job postings offer no direct information on unemployment levels.

Accordingly, although alternative data is available in real time and not subject to the frequent revisions typical of government statistics, it comes with its own drawbacks.

Data Dimension	Govt. Data	Single Atl. Data
Low Revisions	✗	✓
Fast	✗	✓
Unbiased	✓	✗
History	✓	✗
Cost	✓	✗

Table 3: Alternative data typically has its own flaws - it likely has a biased sample, has a shorter time history and is often prohibitively expensive.

MacroX’s philosophy enables a much wider coverage of the labor market culminating in our 9 real-time measures of the labor market on our JOLTS+ dashboard

Unlike other alt data providers, MacroX approaches the problem of measuring the world economy using alternative data as it imagines any professional decision maker would - it tries to find as much information as it can and then reaches a conclusion post-processing said information.

To do that, we use a diversified data strategy, combining multiple independent sources—behavioral, transactional, and geospatial—rather than relying on any single dataset.

Combining many different types of data not only produces a more comprehensive view of the economy but also mitigates bias (by reducing the reliance on any one data source and its particular bias) and hence improves the robustness of our nowcasts.



Fig 7: MacroX’s multimodal engine ingest many different types of alternative data to provide a 360 degree view of the macroeconomy - we approach the problem how we imagine a professional decision-maker would

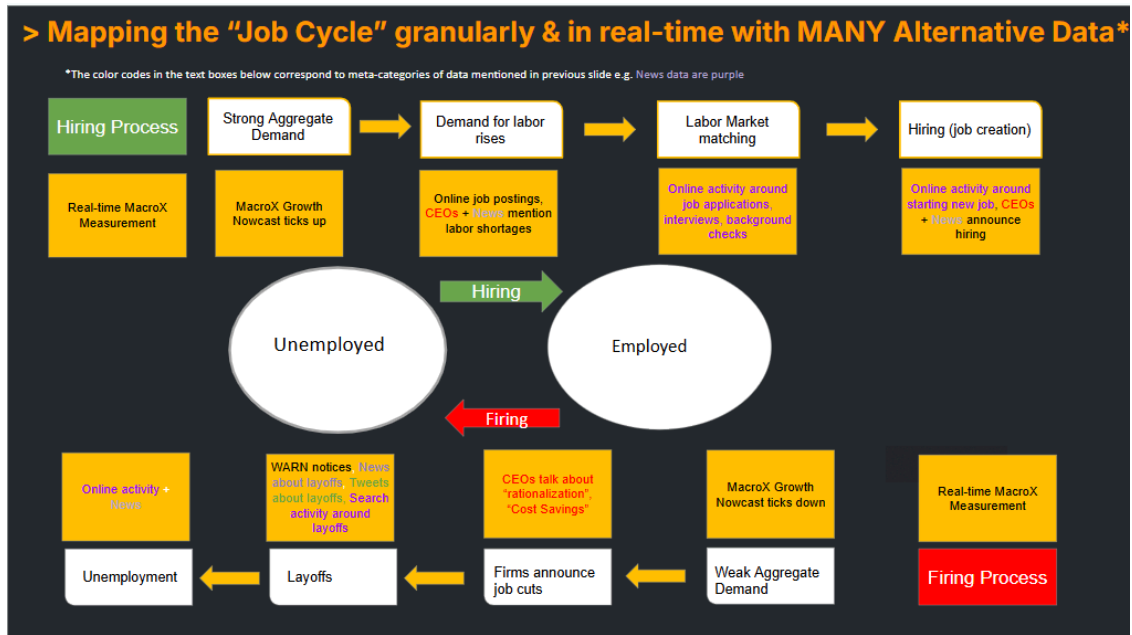


Fig 8: MacroX's approach to measuring the hiring and firing process - we first map out each stage of the "cycle" and think which alternative data can measure each stage accurately and timely.

This approach works for tracking both stocks AND flows in the labor market

An example of how our engine can track key labor market variables is shown in the diagram above, demonstrating how we use many different types of alternative data to track the hiring and firing processes. For instance, in monitoring the hiring process, we systematically map each stage of job creation and leverage our domain expertise to correlate it with social, news, corporate, and job-posting datasets.

We then combine these signals to generate our hiring nowcast. This generalized approach works for tracking both labor market "stocks" (e.g., the unemployment rate) and "flows" (e.g., layoffs). By carefully curating each step of the hiring and firing process, we are able to use our engine to track each individual step, culminating in a holistic and comprehensive view of the process. This means our JOLTS+ dashboard has much more extensive coverage of the labor market than other alternative data providers typically do.

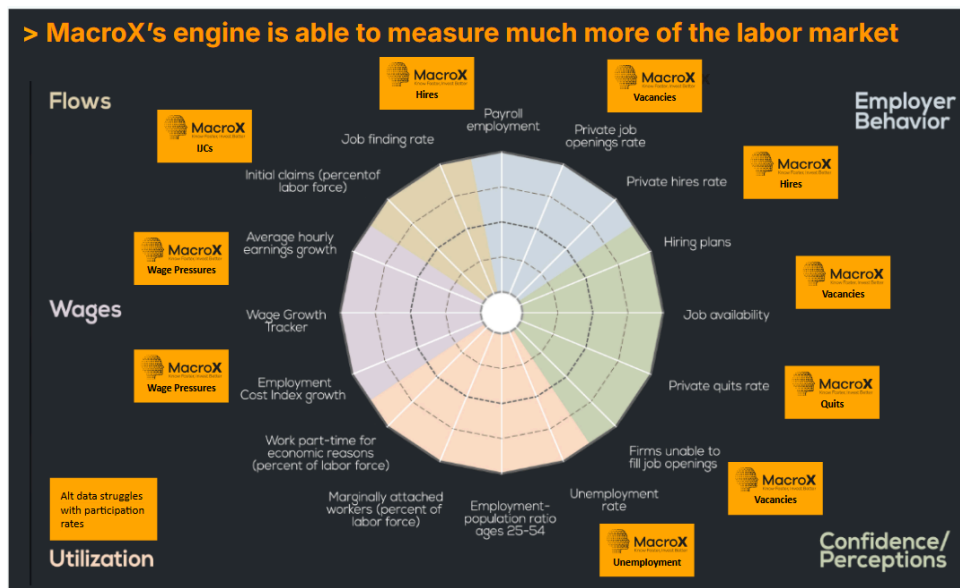


Fig 9: This approach enables a much more comprehensive measurement of the labor market - all our variables are available in real-time, hence ~1m ahead of the lagged government data

This approach is how our measures statistically dominate other alternative data measures when nowcasting key government data releases, e.g., the Employment Cost Index

MacroX believes that understanding a complex system like the labor market requires a broad range of data, and that no single alternative source can provide comparable coverage.

Conclusion

In this note, we explain why a comprehensive view of the labor market requires data across multiple dimensions. Alternative data providers that rely on a single type of source—typically online data—can often measure one aspect well (e.g., job vacancies) but cannot directly capture the many other facets of the labor market.

MacroX, by contrast, intentionally integrates multiple alternative data types to measure nine key labor-market dimensions: unemployment, layoffs, unemployment claims, wage growth, vacancies, quits, hiring, union activity, and public-sector pay pressures. This approach gives users a far more complete view of the labor market and generates statistically superior measurements.

In the next post, we will show how these investors can use these superior measurements for trading purposes.

INTRODUCING THE NEXT GEN OF MACRO DATA				
DATA DIMENSION	GOVT. DATA	SINGLE ALT. DATA	MACROX COMBO ALT. DATA	DETAILS
LOW REVISIONS	✗	✓	✓	<ul style="list-style-type: none"> MacroX Huge Sample Size => Low Revisions
FAST	✗	✓	✓	<ul style="list-style-type: none"> MacroX => 1-3 Months Faster
UNBIASED	✓	✗	✓	<ul style="list-style-type: none"> MacroX Engine combines MANY Alt data & CALIBRATES carefully to government data detail => Low Bias
HISTORY	✓	✗	✓	<ul style="list-style-type: none"> Gov. Data 50Y MacroX 20Y Typical Alt. Data 5-7Y
COST	✓	✗	✓	<ul style="list-style-type: none"> Gov. Data Free; Even a single Alt. data + Expertise is expensive and takes years

Fig 10: MacroX's Multimodal AI engine delivers 10X benefit on the data dimension