

## A Closer Look at a Hot Labor Market

Lauren Bauer, Wendy Edelberg, and Sara Estep



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Our strategy calls for combining public investment, a secure social safety net, and fiscal discipline. In that framework, the Project puts forward innovative proposals from leading economic thinkers—based on credible evidence and experience, not ideology or doctrine—to introduce new and effective policy options into the national debate.

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## Introduction

In this economic analysis, we use the Job Openings and Labor Turnover Survey (JOLTS) data from the Bureau of Labor Statistics (BLS) to determine the degree to which firms that are looking to hire a significant number of workers can expand employment (a “hot” labor market) or cannot (a “tight” labor market). We provide evidence that the **job openings-to-hires** and **job opening-to-net hires ratios** are worthwhile additions to the list of indicators that assess the state of the labor market.

In this analysis we find that most industries are in a “high need” state: the job openings-to-hires ratio hit a historic high in April 2020 and remains elevated in almost every industry. But, we see some evidence that job openings tend to move more than hires, such that an increase in hires is associated with a proportionally large increase in job openings. Moreover, the relationship between job openings and net hires (a better measure of firms’ *expansion* of their payrolls because it accounts for separations) signals a greater payroll expansion per opening than prior to the pandemic. We show below that the very high rate of job openings is evidence that firms desire to expand payrolls significantly and that firms in aggregate can meet their hiring needs, even if additional (yet proportional) effort is needed.

This analysis suggests that a high job opening-to-unemployment rate overstates how hard it is for firms to hire, i.e. how tight the labor market is. An unusually large fraction of hiring is coming from people who reported they were outside the labor force (meaning that they were *not* unemployed and actively seeking work). To be sure, the pace of hiring is very high, unsustainable, and is pushing up wages and inflation. Nonetheless, if it is the case that firms have been able to meet their needs by hiring from a more expansive pool than just the unemployed—including those with jobs and those who are out of the labor force—then perhaps as the labor market returns to a more sustainable pace, more of the adjustment occurs by a drop in job-taking from those people and the unemployment rate does not need to rise as much as some have said in order to settle at a sustainable level.

## What Do Common Labor Market Indicators Show Now?

By nearly any measure the labor market is very hot. Since January 2021, job openings as a share of employment have been higher than any time since 2000 (when data collection started), and monthly gains in payroll employment have remained above 250,000. Comparisons over time are complicated by population growth (which pushes up job gains relative to history) and recent developments in labor force participation (which depress job gains relative to the period from 1970 to 1990). Nonetheless, the fact that job gains have never been this persistently high is remarkable. The enormous and consistent expansion of employment month after month is an indication of a hot labor market.

A related but different question is how tight the labor market is: how far beyond a sustainable level is labor market activity?

## By Some Measures, the Labor Market is Very Tight

- Firms have reported difficulty hiring workers across all industries (Barnes et al. 2022).
- In August 2022, total nonfarm job openings numbered 10 million, and there were 6 million people unemployed and actively seeking work. The three-month average of the ratio of job openings to the number of unemployed was over 1.8, well above the 1.2 ratio in 2019 (which was itself elevated relative to 2017 and earlier). In August, the ratio of job openings-to-unemployed was just modestly below the series high recorded in March 2022.
- Labor demand has grown quickly relative to supply since early 2020, which has resulted in a tighter labor market (Bauer et al. 2022). Even as the recovery in jobs from the pandemic recession has been relatively speedy, labor force participation has remained depressed particularly among older people, likely reflecting retirements that occurred somewhat earlier than they would have in absence of the pandemic (Barnes and Edelberg 2022).
- The labor force is smaller because of COVID-related reasons: morbidity, mortality, early retirements, and immigration.
- The quits rate remains high, with nearly every industry at or above the pre-pandemic series high.

## By Other Measures, the Labor Market is More Hot Than Tight

- Nominal wages gains have not kept pace with inflation, suggesting that firms have not needed to increase real wages on average to expand employment. Relatedly, with the business sector showing remarkable strength, corporate profits in the second quarter of 2022 were 14 percent of national income, close to an all-time high, while compensation as a share of national income roughly equaled its pre-pandemic level.
- The rate of job openings-to-hires is elevated but less dramatically than the ratio of openings-to-unemployed. The job openings-to-hires ratio averaged 1.7 from June to August, up from 1.2 percent in 2019, itself less elevated relative to history than openings-to-unemployed.
- Many openings are being filled by people who reported they had recently been out the labor force entirely (Ahn and Hamilton 2019). In 2021 and so far in 2022, roughly 3.0 percent of the flow into employment was accounted for by people out of the labor force, higher than any year since 1990 (when data collection started). This difference should not be overstated: from 2017 to 2019, the average was 2.9 percent but from 1990 to 2016 it averaged 2.6 percent and never rose above 3.0.



The indicators above provide evidence regarding the extent to which firms can fill open positions. In the remaining analysis, we show how an expansive set of labor market indicators (including the ratios of job openings-to-hires and openings-to-net hires as well as the quits rate) help provide a more complete picture of the labor market.

## What Job Openings and Employment Status Changes are Measured in JOLTS?

### Job Openings

In JOLTS, job openings are measured as the total number of unfilled positions on the final business day of the month. These job openings must meet certain criteria to count: the specific position and associated work exist, the job could start within 30 days, and the employing firm must engage in “active recruiting,” i.e., taking action to fill the job opening, for example advertising on a jobs board.<sup>1</sup> The 30-day rule produces a consistent, narrow, and clear calculation of job openings that excludes both old “phantom” postings for positions that have been filled and postings that are hiring for a start date more than a month in the future. However, the rule does include vacancies for positions that always remain open, as long as the employer is actively recruiting and the job could start within 30 days.<sup>2</sup>

### Hires

Hires made during the month include both newly hired and rehired employees regardless of hours worked or whether the work is seasonal. Additionally, included within the JOLTS hiring measure are on-call employees, individuals hired and separated within the month, transfers from other locations, and employees recalled from a layoff lasting more than seven days. The hire measure does not include transfers or promotions that occur within an establishment or workers returning from strikes.

### Separations

JOLTS measures voluntary and involuntary separations to calculate how many employees leave payroll in a month. The separations measure includes quits, firings, discharges,

retirement, transfers, death, disability, and layoffs. Layoffs are considered a separation if they are expected to last more than seven days and if they are the result of mergers, downsizing, and closures.

## The Job Openings-To-Unemployed Ratio Suggests the Labor Market is Very Tight

The Beveridge Curve shows the relationship between the job openings rate (which is measured as a share of employment) and the unemployment rate, i.e. the ratio of job openings to the share of people who are actively seeking work. Figure 1 plots this relationship with blue dots for 2001 to 2007, green dots for 2007 to early 2020, orange dots for 2021, and purple dots for the data in hand for 2022. The observations for March 2020 to December 2020 are excluded because the depths of the pandemic created very unusual and less informative movements.

The fact that the job openings are very high is a clear sign that the labor market is hot. Moreover, employers during 2021 and 2022 have been posting far more jobs relative to unemployment than in prior periods, indicating that they are struggling to an unusual degree to find workers to fill the positions. At this time, the Beveridge Curve suggests the labor market is very tight—the fact that the job opening rate is unusually high relative to the unemployment rate is an indication firms cannot hire the workers that they need. More precisely, the 12-month average through August 2022 of the job openings rate is a remarkable 8 standard deviations above the value predicted using the best-fit line.

Some have argued that a substantial increase in unemployment will be needed to bring down the job openings rate (Ball et al. 2022; Blanchard et al. 2022) while others have argued that the very sharp change in the relationship between jobs openings and the unemployment rate may overstate how much the unemployment rate needs to rise to return the labor market to a sustainable level of activity (Figura and Waller 2022). Next, we explore some additional labor market indicators to assess the labor market.

## What Information Does the Relationship between Job Openings and Hires Provide about Labor Market Activity?

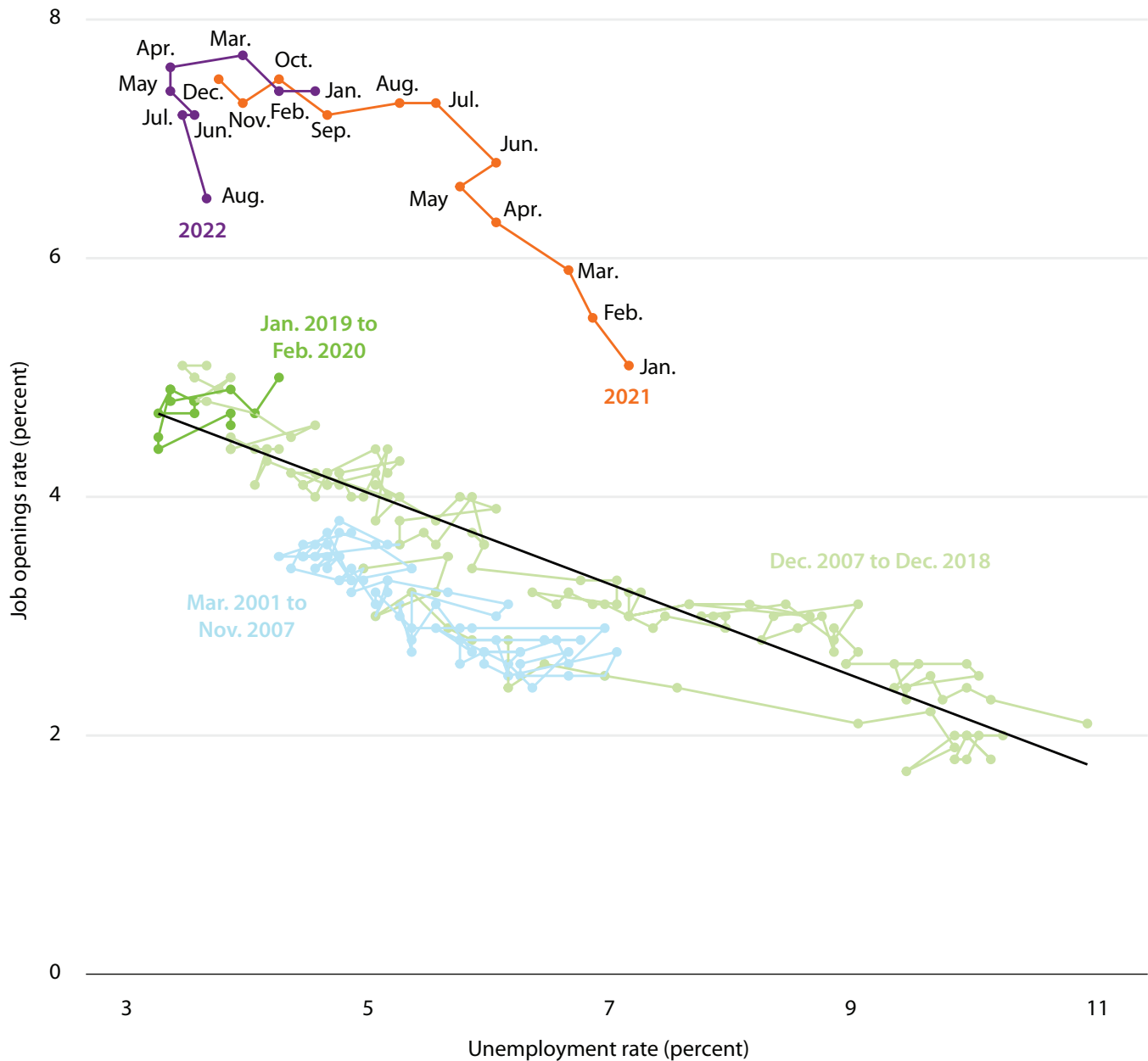
The job openings-to-hires ratio could be used as another indicator of whether the labor market is tight. This ratio captures the difficulty that firms have in hiring workers for positions that they want filled within 30 days. When the job openings-to-hires ratio is above one, the job openings rate is greater than the hires rate. An industry in this circumstance is defined as “high need” (Mueller and Wohlford n.d.)

Figure 2 shows the openings-to-hires ratio by industry from January 2001 to August 2022. In 2014, only six

1. Under this definition, the following behaviors would *not* count as a job opening: promotions or demotions, individuals recalled from layoffs, jobs only available to internal transfers, positions that have hired someone who has yet to respond for work, and openings designed for temporary or contracted employees or consultants.
2. During the pandemic, the availability of remote work options may have led some companies to post the same job more than once, leading to duplication and inflated job opening numbers. Using data from the labor market analytics company Linkup, researchers at Goldman Sachs estimated in May 2022 that about 3 percentage points of the 65 percent increase in job openings shown in the Linkup data since the pandemic began were due to duplicate postings (Hatzius et al. 2022). JOLTS data, however, may not be susceptible to this duplication problem because JOLTS surveys employers directly.

FIGURE 1

## Job Openings Rate to Unemployment Rate, March 2001–August 2022



Source: Bureau of Labor Statistics, n.d.

Note: The series is total private industry; data points for March 2020 to December 2020 are excluded. The black trend line is for the points covering December 2007 to February 2020.

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industries had greater job openings than hires; at the time, a BLS study called those industries “historically unusual” because they had such high ratios (Oslund 2016). In recent years, every industry has entered this range. Moreover, since 2020, across all private industries the job openings-to-hires ratio has been well above historical levels. In August 2022, the ratio was more than 30 percent higher than its 2019 average.

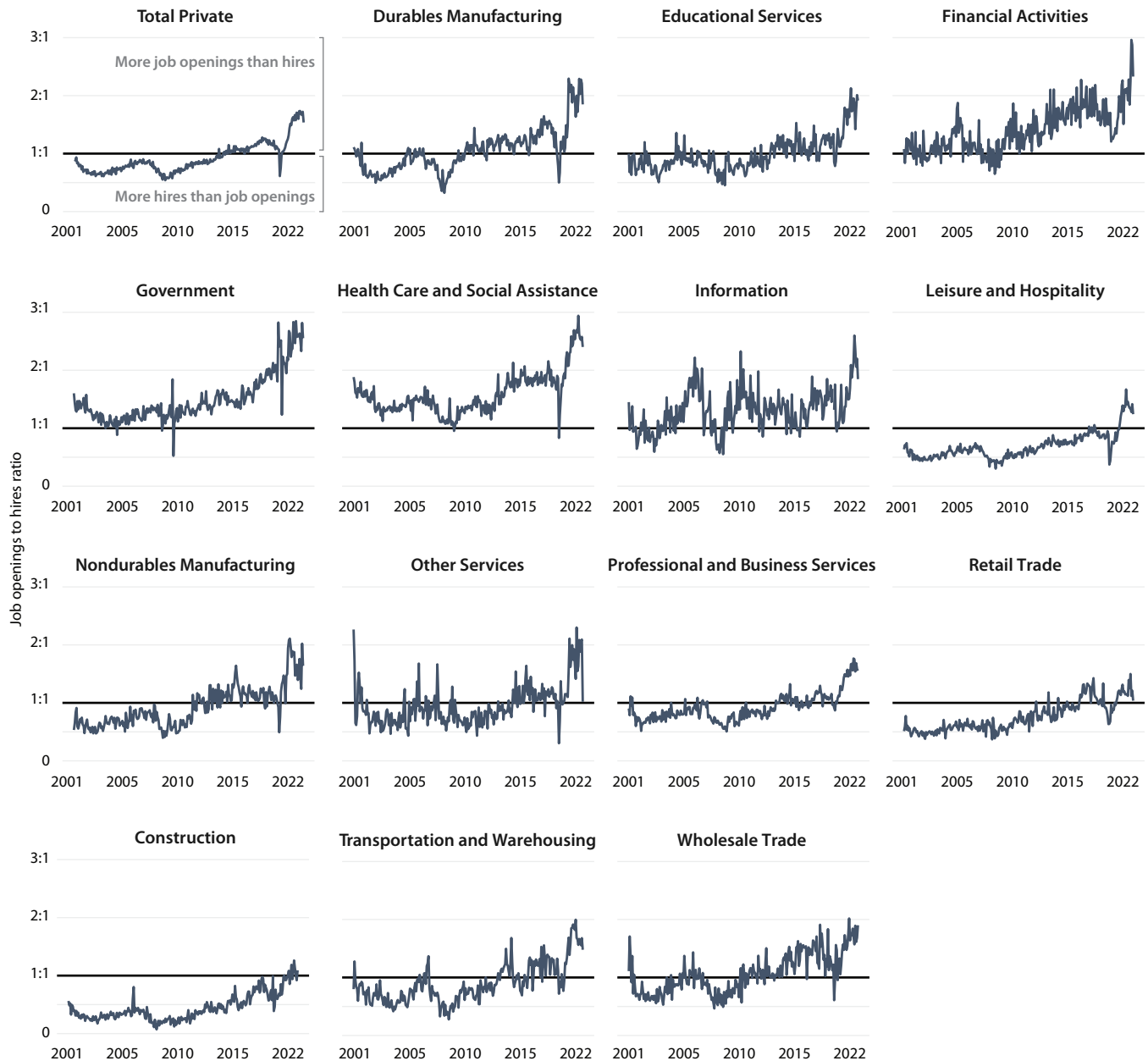
Nevertheless, the ratios vary considerably across industries. Some industries, like health care and social assistance, have been high need for the vast majority of the series. However, construction and retail have typically been below one,

implying that some hiring has occurred in the absence of the formal job openings that JOLTS counts. Some industries have been generally more cyclical and some have been strongly affected in the recent cycle: for example, the openings-to-hires ratio in leisure and hospitality is more than 40 percent higher now than it averaged in 2019. In contrast, for retail trade the ratio is close to its pre-pandemic level.

While the job openings-to-hires ratio is significantly elevated by historical standards, that same history shows that when industries increase hiring, job openings typically rise disproportionately. In other words, historical patterns

FIGURE 2

## Job Openings to Hires Ratio, January 2001 to August 2022



Source: Bureau of Labor Statistics, n.d.

Note: When the ratio is above one, the openings rate exceeds the hires rate and the industry is considered “high need.” The transportation and warehousing industry includes utilities and mining and logging have been excluded due to industry size and volatility. When the job openings-to-hires ratio is 0, there are no openings or hires.

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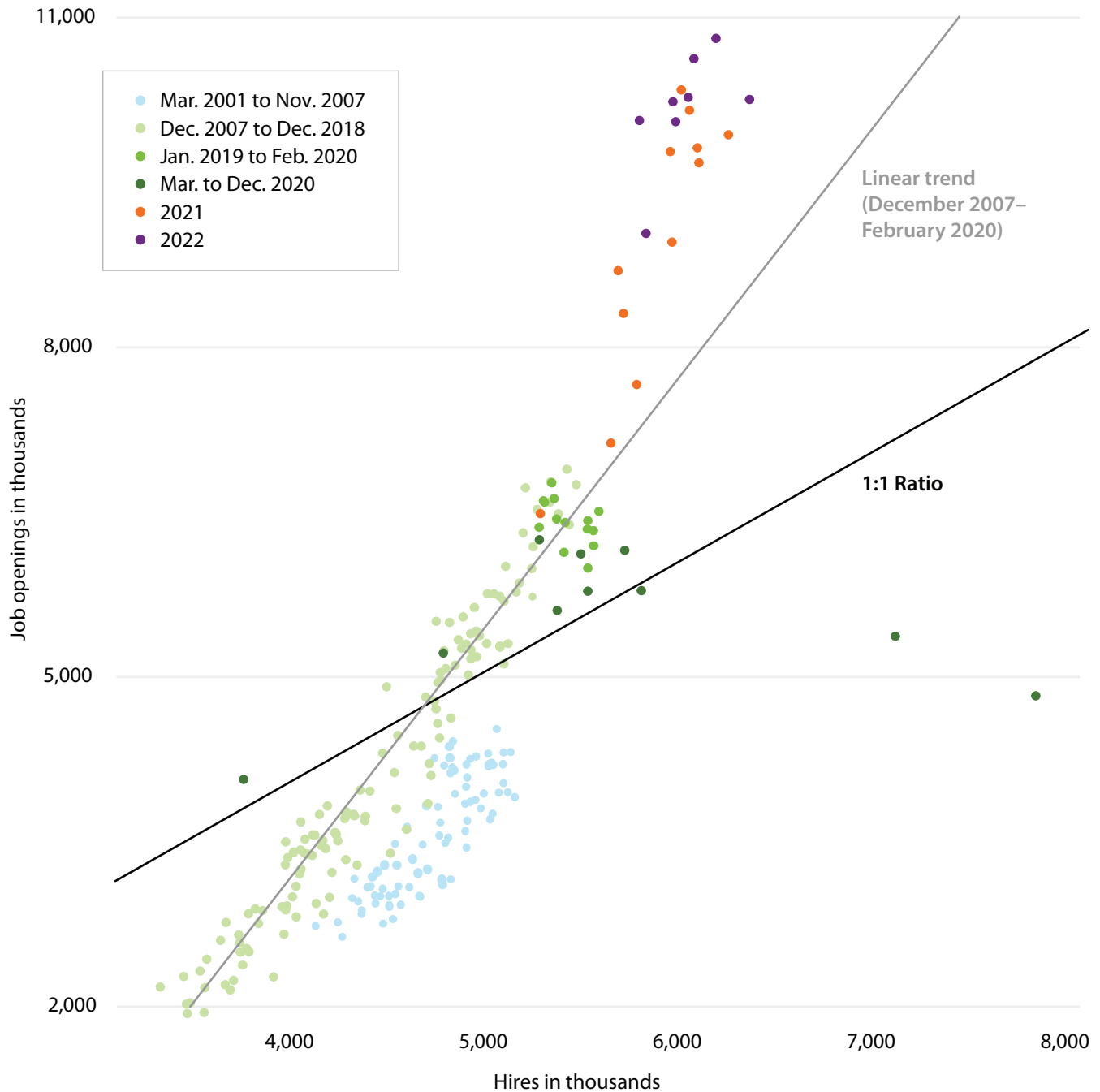
suggest that as the number of hires increases by 1 million, the number of job openings increase by *more* than 1 million.

The Beveridge curve in Figure 1 suggests that as job openings come down to more a sustainable level, the unemployment rate will settle at a rate considerably higher than just before the pandemic. We can ask a similar question of the job openings-to-hires rate. Would a more sustainable rate of job openings imply a much lower hire rate than before the pandemic?

To start answering this question, we replot the job openings-to-hires ratio for total private industry in a slightly different format in Figure 3. The figures for specific industry sectors are shown in the appendix. We place the number of job openings on the vertical axis and the number of hires on the horizontal axis. Each dot represents a particular month’s values, with time periods denoted by color: March 2001–November 2007 (light blue), December 2007–December 2018 (light green), January 2019–February 2020 (bright

FIGURE 3

## Job Openings to Hires Over Time, Total Private Industry, by Business Cycle



Source: Bureau of Labor Statistics, n.d.

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green), March–December 2020 (dark green), 2021 (orange), 2022 (purple). Drawn through these graphs is a black line that represents the 1:1 job openings-to-hires ratio and a linear best-fit line for the December 2007–February 2020 ratio (grey). This figure helps explore the degree to which the elevated ratio of job openings-to-hires is driven by firms wanting to hire more workers versus their decreased ability

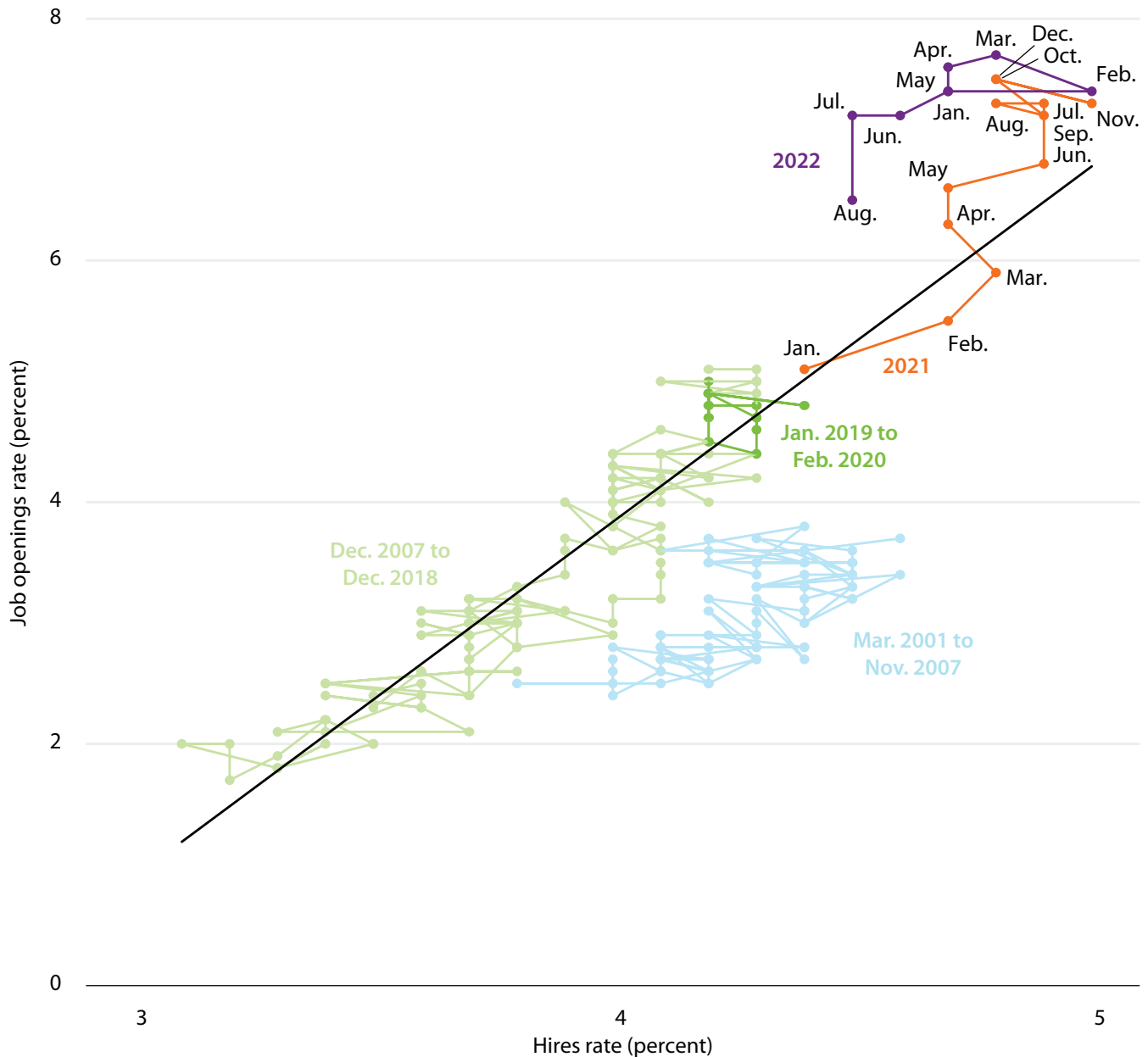
to hire. From the 2001–07 period (light blue) to the 2007–18 period (light green) there was a leftward shift, meaning that there were fewer hires per opening.

Since the end of 2020, both openings and hires have been significantly elevated and openings have been more elevated than hires. On one hand, the job market is clearly hot given that firms have elevated rates of both openings and



FIGURE 4

## Job Openings Rate to Hires Rate, March 2001–August 2022



Source: Bureau of Labor Statistics, n.d.

Note: The series is total private industry and points for March 2020 to December 2020 are excluded. The black trend line is for the points covering December 2007 to February 2020.

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hiring. On the other hand, the elevated ratio may not reflect that much tightness, given what historical patterns show is required when firms desire a very high rate of hiring. Put differently, despite the very high level of current job openings, the relationship between openings and hires today across all private industry shown in Figure 3 lies close but above the pre-pandemic best-fit line (grey), if outside historical ranges.<sup>3</sup>

3. We also calculated the job openings-to-hires ratio with a one-month lag for job openings because JOLTS captures job openings at the end of the month rather than the beginning. The analysis does not substantially change with the calculation of the ratio is computed with the lag.

Next, in Figure 4 we plot the job openings rate against the hires rate in the same way that we plot the Beveridge curve above in Figure 1. The relationship using the hires rate points to less disruption in the labor market in order to achieve a more sustainable rate of job openings. In August 2022, the 12-month average of the job openings rate was 3.6 standard deviations above the level consistent with the historical relationship—suggesting more consistency with history than the Beveridge Curve. Thought about another way, Figure 1 suggests that if the job openings rate was to return to its 2019 average of about 4.7 percent, recent history

points to an unemployment rate as high as 8 to 10 percent based on recent data. In this sense, the labor market appears to be so tight currently that a more sustainable pace implies more than a doubling of the unemployment rate. Instead, consider the job opening-to-hire rate: if the job opening rate were to return to its 2019 average, recent history points to a hires rate of 4 percent, consistent with the pace of hiring in 2014 and 2015. That labor market outcome would be far less disruptive than an unemployment rate of 8 to 10 percent.

Over the 2007 to 2020 business cycle, both the job openings-to-unemployed ratio as well as the job openings-to-hire ratio have explanatory power for wage growth and price growth.<sup>4</sup> However, the job openings-to-hire ratio does a better job than the job openings-to-unemployment ratio of predicting the growth in wages since early 2021. Because the unemployment rate rose so dramatically early in the pandemic, the job openings-to-unemployment ratio predicts considerable softness in wage growth for most of 2021, with growth rates returning to pre-pandemic levels in mid-2022 (and then poised to keep rising). In contrast, the quick onset of an elevated hires rate helped the job openings-to-hire ratio to predict strong wage growth as firms quickly expanded payrolls. The result is the increase in that ratio can explain 0.4 percentage points of the 2.5 percentage point increase in wage growth (as measured by the Employment Cost Index) from the first quarter of 2021 through the second quarter of 2022.

## How Does Job Churn Affect the Labor Market?

Just because a job posting has been filled does not indicate that the job will stay filled. As we have highlighted through the recovery from the COVID-19 pandemic, an elevated quits rate is evidence of a hot labor market (Bauer et al. 2021). However, we find that workers may be cycling through jobs as labor demand shifts across industries and employers raise wages to convince workers to switch (Barnes et al. 2022). Part of the elevated opening and hire rates thus result from high turnover: that suggests that a higher-than-normal number of jobs being filled are not long-term matches.

Figure 5 shows the quits rate, overall and for each industry. The quits rate was rising from 2010 to early 2020, in line with the decline in the unemployment rate over that period. However, some researchers have noted that the quits rate may have been also rising for noncyclical reasons. A recent paper splits firm job postings into two categories based on which population they target—the unemployed and people currently employed with a rival firm (Cheremukhin and Restrepo-Echavarría 2022). They find that there has been a major shift towards job poaching since roughly 2015. This may play a role in the rising quits trend over the period. The

authors argue that this phenomenon weakens the relationship between job openings and unemployment. One piece of evidence of a noncyclical increase in the quits rate is that the 12-month average of the quits rate peaked just before the pandemic at a level about 5 percent higher than the peak prior to the Great Recession.

The quits rate rose sharply through 2021—far more than would be expected given the historical relationship with the unemployment rate. In recent months, however, quits rates in most industries have been falling.

To the degree that the quits rate remains higher for the kinds of reasons that Cheremukhin and Restrepo-Echavarría cite, those argue that the relationship between job openings and unemployment has weakened. In other words, any reduction in job openings resulting from tighter monetary policy might partly result in reduced poaching rather than an increase in the unemployment rate than in the past, increasing the likelihood of a soft landing.

In addition to the churn generated by quits, other separations have also been elevated, with many of those separations occurring in the summer and fall of 2021. Other separations—distinct from layoffs and quits—include transfers to other locations of the employer, retirement, and exits due to death or disability. While these components are not separated in the JOLTS data, other researchers, using high frequency job postings data from the analytics company Lightcast (formerly known as Emsi Burning Glass), have found that retirements and changing worker preferences account for a significant amount of churn (Forsythe et al. 2022).

## Are Firms Expanding Their Payrolls?

Historically, a declining quits rate has straightforward and helpful implications for employers: higher retention and the ability to expand their workforce with reduced hiring and less churn. Consider that firms surely maintain some job openings in anticipation of quits (particularly firms with jobs that are always open). Fewer separations may necessitate fewer hires, even with unchanged job openings. “Net hires”—total hires less total separations—allow us to quantify the relationship between job openings and expansion of payrolls. Since 2001, net hires have tended to be positive but, not unsurprisingly, much closer to zero than gross hires. This means that in most months, hires are largely replacing employees who separated.<sup>5</sup>

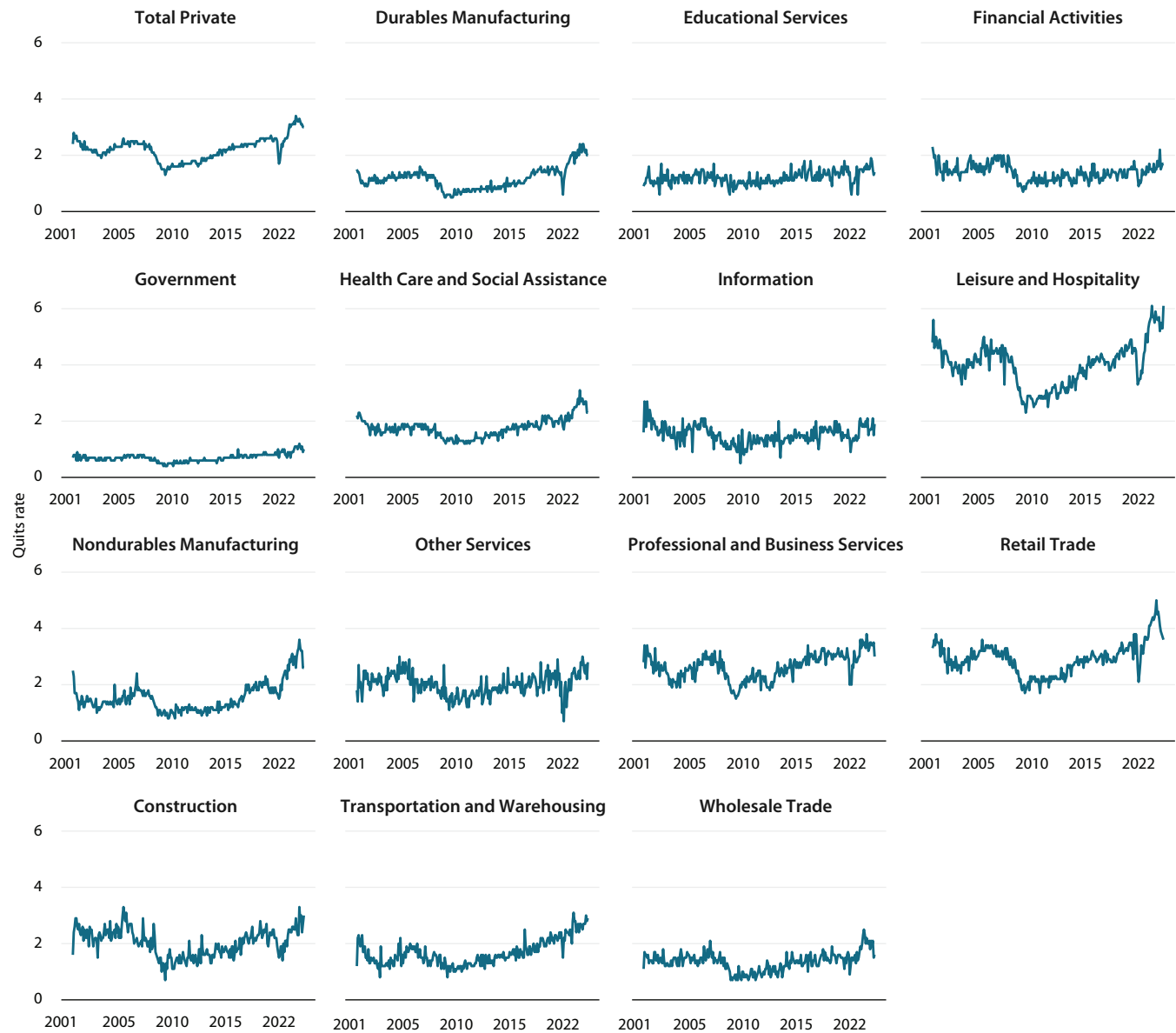
Figure 6 plots, by industry, the annual average of job openings (on the vertical axis) against average net hires (on the horizontal axis) for the four years prior to the pandemic (2016-2019), 2021, and 2022—we omit 2020. In the four years prior to the pandemic, most industries cluster in a narrow range (dark green). Several services industries are outside that cluster and are identified separately: government, healthcare and social assistance, leisure and hospitality, other services, and professional and business services.

4. Consistent with the approach used by Furman and Powell (2021), we estimate Phillips curves with the two ratios as measures of labor market slack over the 2007-2020 business cycle, with ECI growth and core CPI growth as the wage and price inflation measures of interest. Using the job openings-to-unemployed ratio, the adjusted R-squared ranges from 0.5 to 0.7. Using the job openings-to-hires ratio, the adjusted R-squared ranges from 0.4 to 0.7.

5. Negative net hires indicate that the industry is contracting.

FIGURE 5

## Quits Rate, January 2001–August 2022



Source: Bureau of Labor Statistics, n.d.

Note: The transportation and warehousing industry includes utilities and mining and logging have been excluded due to industry size and volatility.

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We show trend lines for each of the four years (weighted by job openings in each industry; in shades of gray); comparing the trends against each other for the pre-pandemic period, we show that the relationship did not vary much.

In 2021, the relationship between job openings and net hires changed dramatically, particularly in service-oriented industries. Net hires relative to job openings were particularly strong in leisure and hospitality. By 2022, the relationship between job openings and net hires had generally returned to the pre-pandemic relationship, even as job openings and net hires remain significantly elevated. Remarkably, some industries continue to show a historically low ratio of job openings

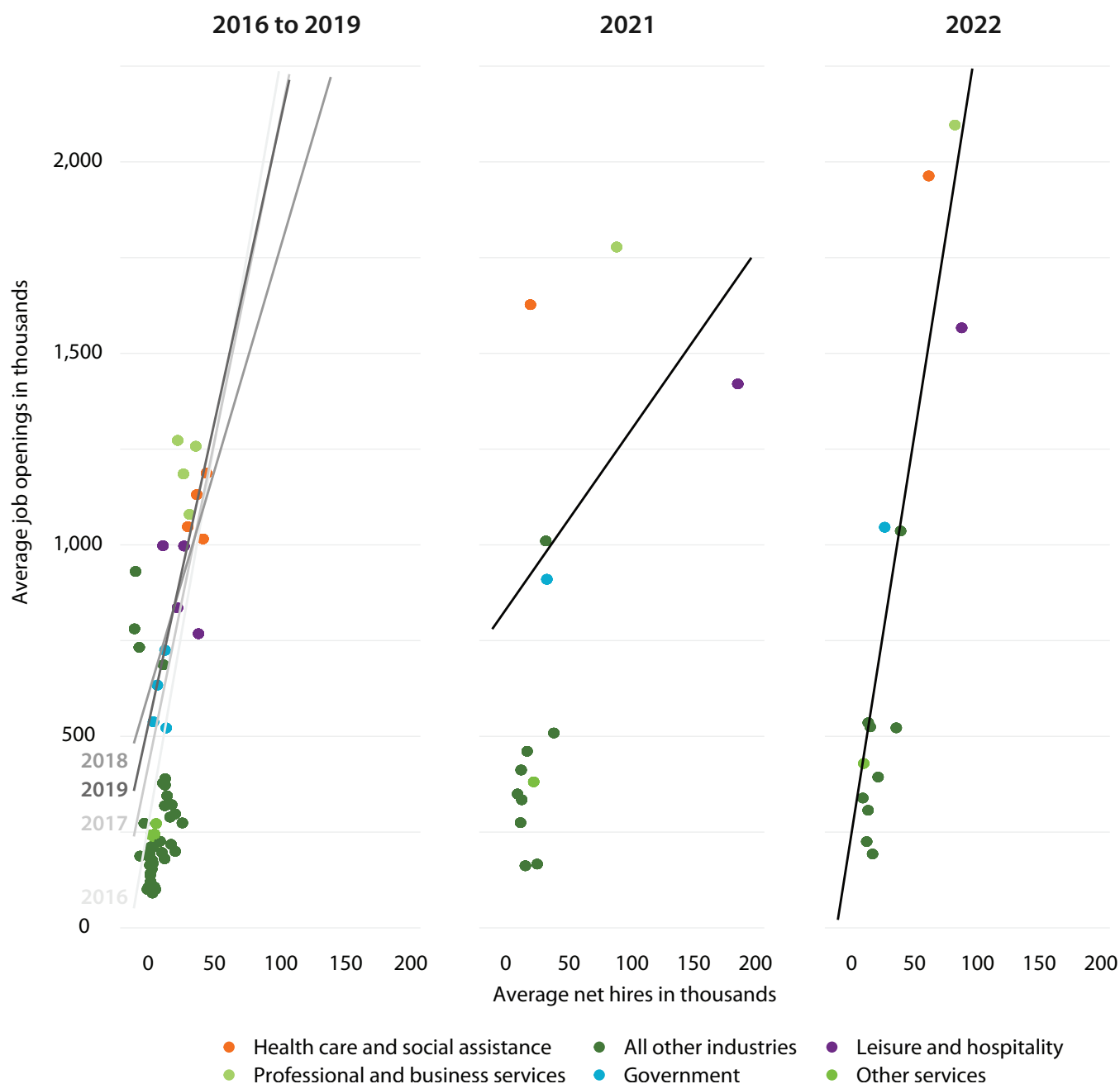
to net hires. For example, the ratio in the leisure and hospitality sector (purple) in 2019 was 35 job openings per net expansion in the workforce of one worker; in 2022, that ratio was only 17 job openings per net expansion of one worker.

We take the results in Figure 6 to suggest additional evidence that dynamics in the labor market do not look sharply different now than in the past: job openings are high in large part because firms are intent on expanding payrolls. This should temper concerns that the high level of job openings suggests a breakdown in firms' ability to match with workers.

Nevertheless, this measure is less useful in understanding inflation dynamics. Models that use the ratio of job

FIGURE 6

## Job Openings to Net Hires, Annual Average by Industry



Source: Bureau of Labor Statistics, n.d.

Note: Net hires is total hires less total separations. The trend line is weighted by the number of job openings in each industry. The transportation and warehousing industry includes utilities and mining and logging have been excluded due to industry size and volatility.

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openings-to-net hires to explain wage and price inflation show that the ratio does indeed have explanatory power, but movements in the ratio explain a relatively small amount of variation in inflation. Net hires can move around for multiple reasons: fewer layoffs, fewer quits, and more hires. As a result, net hires—while worthy of further study—is a complicated measure to help understand labor market dynamics over a business cycle.

## Conclusion

Does it matter whether the labor market is very hot and very tight or instead very hot and moderately tight? Because of the current focus on the inflation side of the Federal Reserve's dual mandate, perhaps not. Regardless of what factors have led to the surge in inflation—a tight labor market, a shift in preferences for goods and housing, pandemic-related supply

constraints, and so forth—the Fed’s main tool to dampen inflation will consequently make the labor market both less hot and less tight.

However, the extent to which labor market dynamics have changed—and whether the labor market of the next few years will look different than before—does matter. If the labor market is very tight right now even though the August unemployment rate was near its 2019 level of 3.7 percent, perhaps unemployment needs to rise significantly simply to reach a sustainable level, meaning a level that does not put pressure on inflation. Perhaps unemployment needs to rise even more if reducing inflation requires generating labor market slack. But, if the labor market is very hot but not very tight, perhaps the unemployment rate needs to rise only moderately to get to a sustainable level consistent with stable and acceptably low inflation.

On net, structural factors such as an aging population, higher educational attainment, changes to disability insurance, and the secular decline in participation among less educated adults continue to dampen labor force participation (Aaronson et al. 2014). Moreover, among some groups, such as those over the age of 55, participation remains depressed relative to pre-pandemic projections. Additionally, a backlogged immigration system and excess deaths and disability due to COVID-19 are suppressing labor supply compared to trend. This evidence of a persistently lower level of labor supply suggests that employment likely need to settle below pre-pandemic projections.

But the evidence from the job openings-to-hires and job openings-to-net-hires ratios presented above, as well as recent work on the job openings-to-unemployment ratio (the Beveridge Curve), show that the ability for employers and workers to match jobs may not have changed much recently (Figura and Waller 2022). Hall and Kudlyak (2022) describe ways in which the job finding rate among the unemployed has been remarkably elevated since 2020. They distinguish between the unemployed on temporary layoff and others who are jobless in a more permanent sense. For the latter group, they find that the unemployment rate from November 2020 through the following year fell “three times faster than its historical rate” because the job-finding rate was close to the relatively healthy levels seen in 2015 and 2016.

The data thus suggest that in the near term, as the labor market cools, we will see job openings decline more rapidly than hires. Indeed, from its peak in March through August job openings fell by 1.8 million, a decline of 16 percent, while hires fell roughly 400,000, or about 6 percent over that same period. The quits rate, job openings-to-hires ratio, and job openings-to-net hires ratio are worthwhile indicators to track as policymakers try to combat inflation while minimizing damage to workers. Hopefully, inflation will ease by getting the labor market back to sustainable levels—without opening up significant slack.

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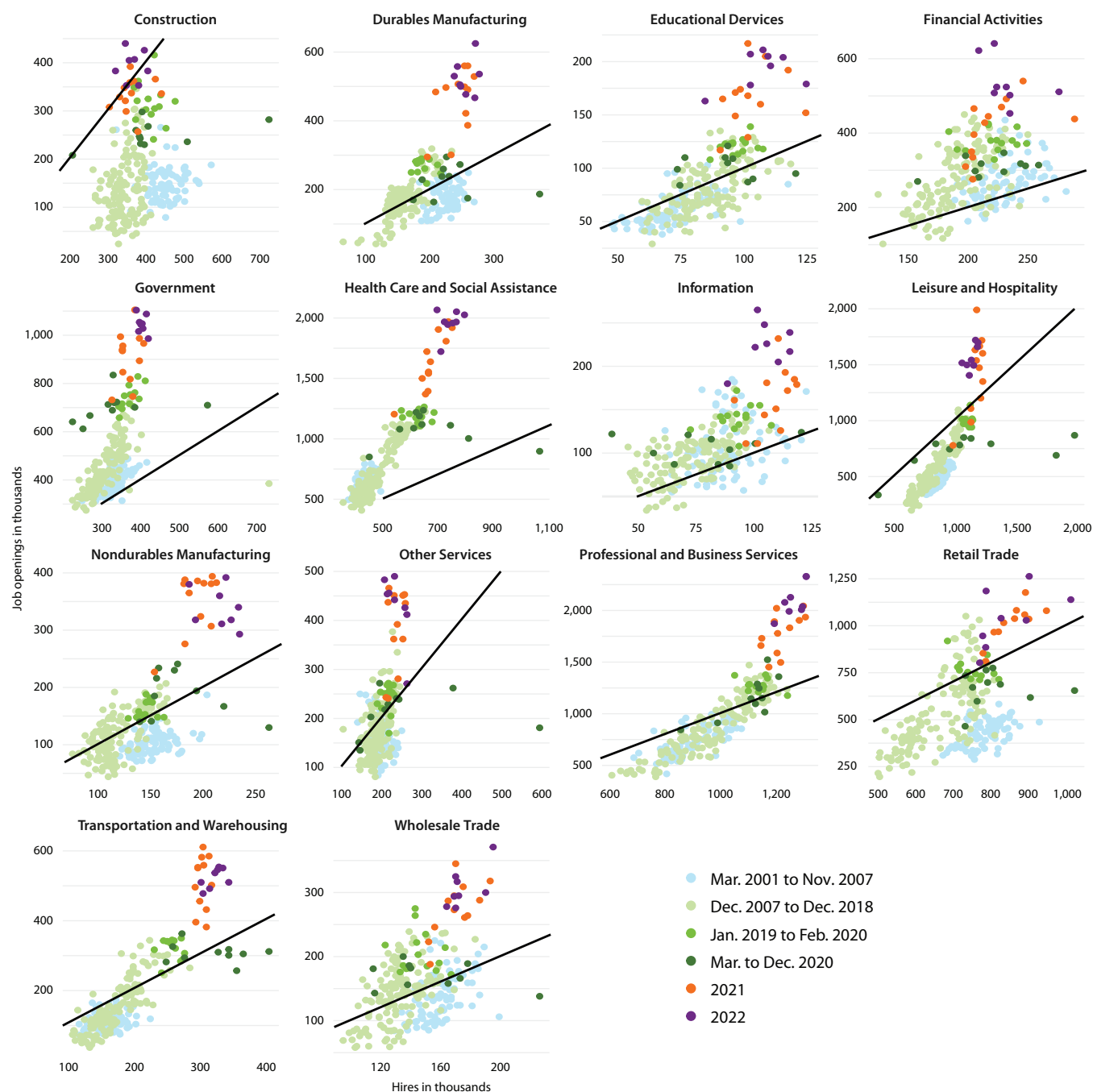


## Appendix

Figure A-1 shows the relationship between job openings and hires by industry. It is the same analysis shown in Figure 3. Most industries follow the pattern of the aggregate, meaning that the relationship between openings and hires in 2021 and 2022 are outside the historic range but close to the pre-pandemic best-fit line. These industries include durable and non-durable goods, construction, leisure and hospitality, retail, wholesale, professional services, and government. A few—educational services, health care and social assistance, other services, and transportation and warehousing—saw less of a shift in openings per hire between March 2001–November 2007 and December 2007–2018. Two industries, financial activities and information, have shown a relationship between openings and hiring in the last two years more typical of earlier periods.

FIGURE A-1

### Job Openings to Hires Over Time, by Industry and Business Cycle



Source: Bureau of Labor Statistics, n.d.

Note: The black line depicts the 1:1 ratio of job openings to hires. The transportation and warehousing industry includes utilities and mining and logging have been excluded due to industry size and volatility.



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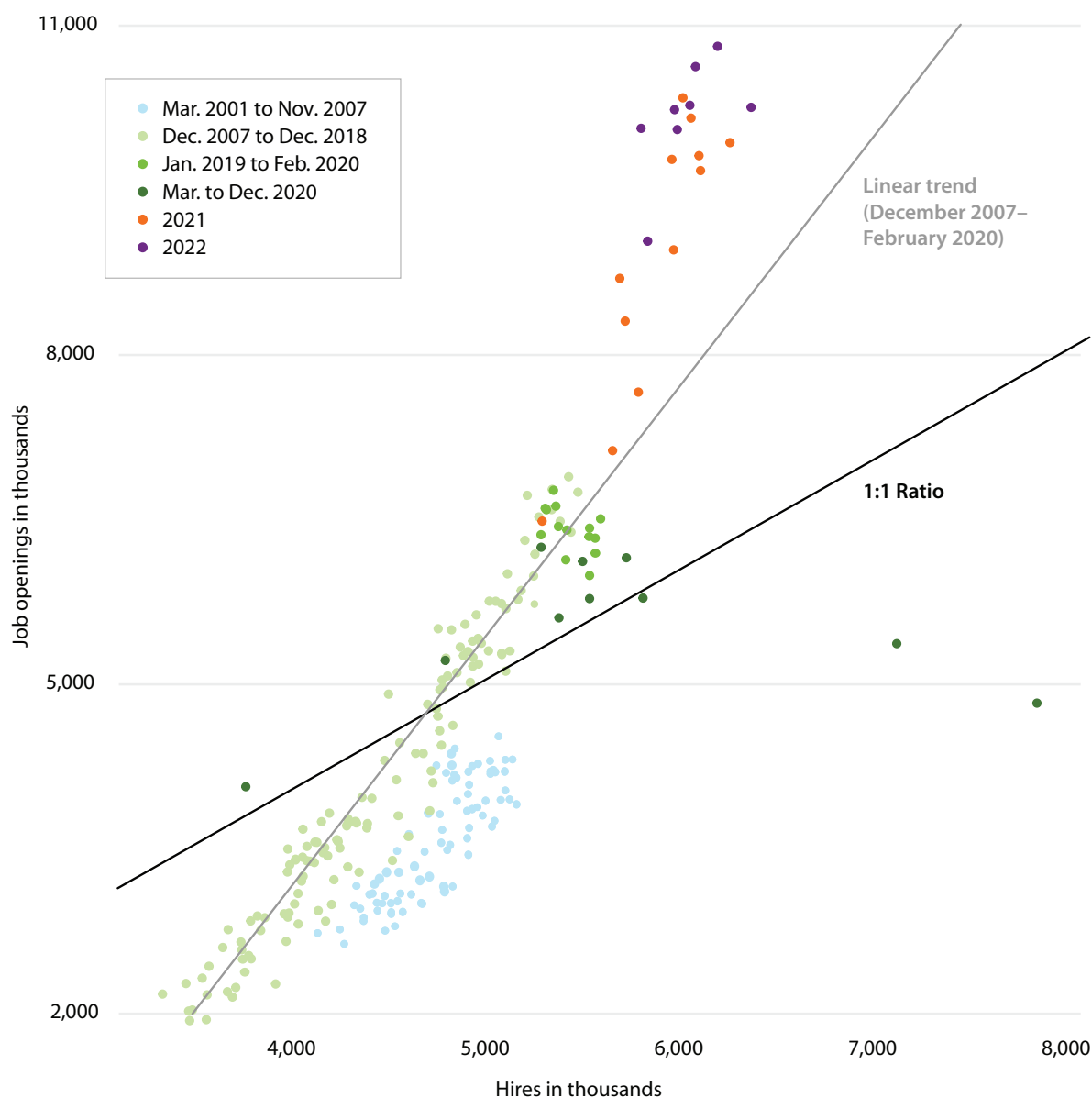
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Director

In this economic analysis, we use the Job Openings and Labor Turnover Survey (JOLTS) data from the Bureau of Labor Statistics (BLS) to determine the degree to which firms that are looking to hire a significant number of workers can expand employment (a “hot” labor market) or cannot (a “tight” labor market). This analysis suggests that a high job opening-to-unemployment rate ratio overstates how hard it is for firms to hire, i.e. how tight the labor market is. We provide evidence that the job openings-to-hires and job opening-to-net hires ratios are worthwhile additions to the list of indicators that assess the state of the labor market. If it is the case that firms have been able to meet their needs by hiring from a more expansive pool than just the unemployed—including those with jobs and those who are out of the labor force—then perhaps as the labor market returns to a more sustainable pace, more of the adjustment occurs by a drop in job-taking from those people and the unemployment rate does not need to rise as much as some have said in order to settle at a sustainable level.

## Job Openings to Hires Over Time, Total Private Industry, by Business Cycle



Source: Bureau of Labor Statistics, n.d.



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