

# Economic Watch

US

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Economic Analysis

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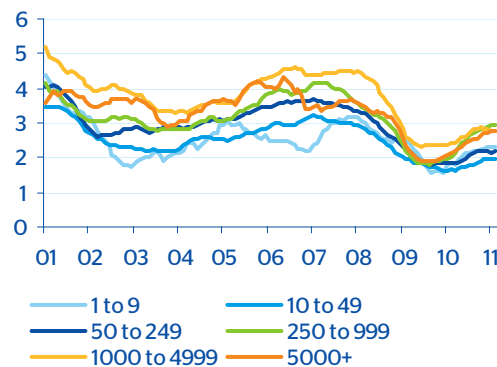
## Which Firm Sizes are Matching Jobs? Analyzing Structural Unemployment by Firm Size

- Uncertainty over matching efficiency likely increases during recessions
- The duration of a job opening is the highest for the largest of firms
- Different firm sizes entail unique short- and long-term matching effects

### Taking a Closer Look at Unofficial JOLTS Data

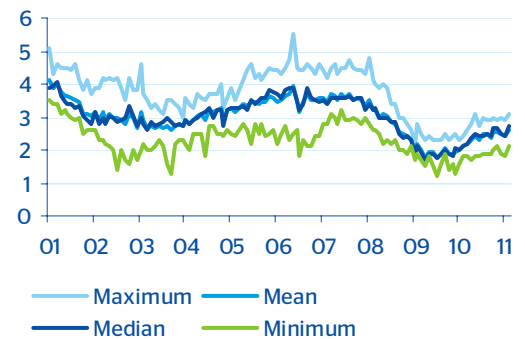
The Bureau of Labor Statistics (BLS) is currently experimenting with data on job openings by size of firm, a project that is an outcropping of the regularly-released Job Openings and Labor Turnover Survey (JOLTS). The JOLTS data is closely watched for its insight into the degree of structural unemployment in the economy. The survey achieves this by gathering information on job openings, hirings and separations. Structural unemployment represents the part of the labor force that is long-term unemployed as a result of inappropriate or degraded skills, sectoral shifts in the economy, labor market policies, or other related factors (see our previous [Economic Watch](#)). Structural unemployment is a serious issue not only for those caught in long-term unemployment, but also for monetary policy as it affects the natural rate of unemployment in the economy and therefore the degree of tightening necessary to combat inflation. In this brief, we take a closer look at the openings by size classes and its implications for structural unemployment.

Chart 1  
**Job Opening Rates by Firm Size, 6MMA, %**



Source: BLS (Unofficial) and BBVA Research

Chart 2  
**Job Opening Rates Dispersion, %**

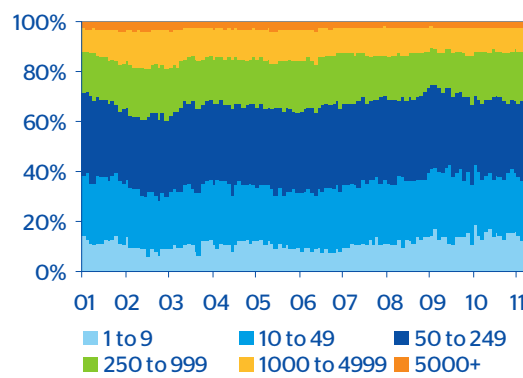


Source: BLS (Unofficial) and BBVA Research

The data in particular entails the advantage of more up-to-date information on hirings and separations by class size than the BLS' Business Employment Dynamics (BED) dataset, which is lagged two quarters. Additionally it offers monthly job openings by firm size, although the dataset is only back to December of 2000. Our first step is to generate a 6-month moving average of the job opening rates by firm size as the month-to-month data is quite volatile. The top three size classes (Chart 1) typically lead in terms of job opening rates, although later we will discuss how the amount (or level) of job openings is opposite to this trend. Firms with 250-999 employees demonstrated the most dramatic decline and turnaround of all the size classes during the most recent crisis and recovery. The job openings rate for the smallest of firms appears as emaciated as the previous recession, but declines in openings rates for the 10-49 and 50-249 size classes are worse than the previous recession. These firms' openings rates remain lower than the previous recession. There appears to be some separation between firms with more than 250 employees and those with fewer than 250 employees. Another way of describing the job openings rate is by the dispersion of rates, which suggests both a compression of rates across firm sizes and a downward shift relative to the history of the data (Chart 2). This tightening of all job opening rates is partly a circumstance of a very sharp recession. The overall downward shift is suggestive of more sluggish hiring in the wake of the crisis. Although the data series is very short, the danger is that this downward shift turns into a permanent shift.

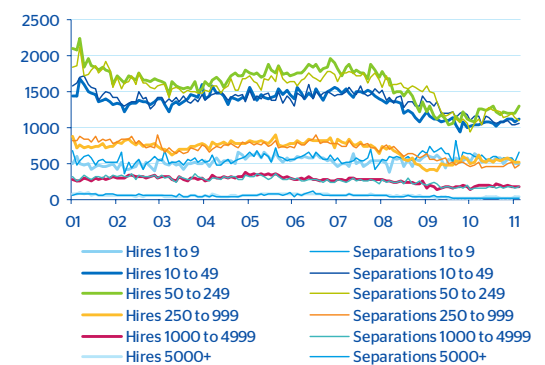
However, the perspective on job opening rates is different when we check the actual amount of openings. As Chart 3 suggests, the bulk of openings are generated by the first three size classes of firms, which is a function of their higher birth and death rates than larger firms. The churning process of creative destruction is highest in these firms. Larger firms tend to be older and slower-growing, but more stable. The BLS does mention one caveat: openings for the smallest firms are slightly understated, while openings for the largest firms are slightly overstated. Similar to the BED data, we can also generate figures on hirings and separations by firm size class. The data suggest a slight downwards shift for the second- and third-smallest size classes, although these two groups are moving most of the hirings and firings. If we can think of a natural ranking for these size classes, the smallest size class and the 250-999 employee size class have changed positions with the past two years' data (Chart 4).

Chart 3  
Distribution of Job Openings by Firm Size



Source: BLS (Unofficial) and BBVA Research

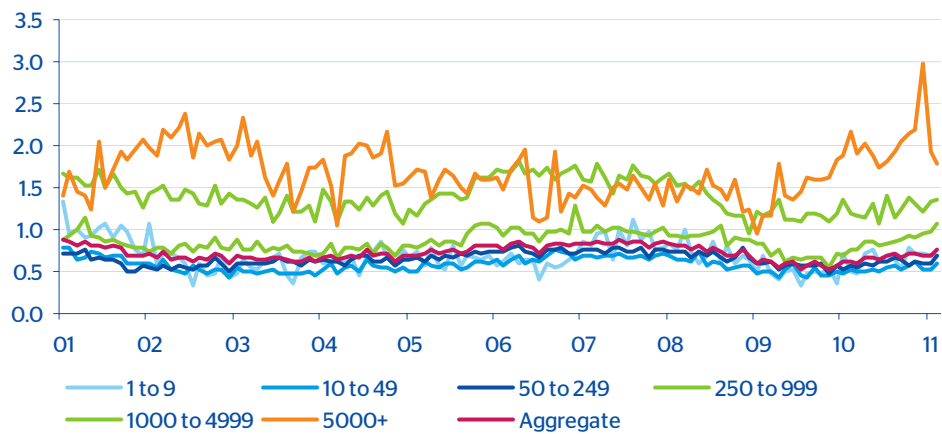
Chart 4  
Hirings and Separations by Firm Size, in Th



Source: BLS (Unofficial) and BBVA Research

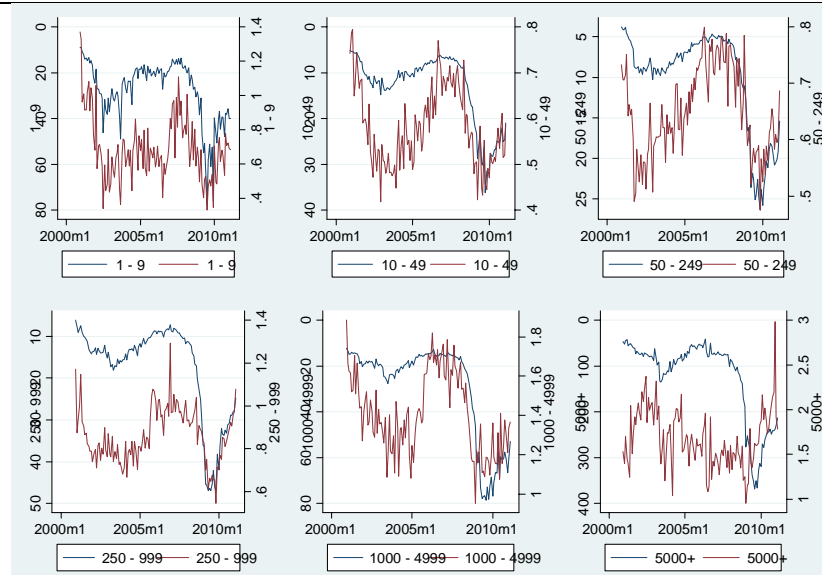
These indicators are useful in estimating the matching function, which is the term for the process whereby the unemployed are matched to job openings and eventually hired. One simple way of investigating structural unemployment is to zero in on the relationship between hiring and job vacancies and unemployment. Since some firm size classes are driving the lion's share of openings, hirings and firings, we would expect the matching function to fit differently across firm sizes. Indeed, Charts 5 and 6 provide some evidence for this presupposition. Vacancy durations are much higher for larger firms as they have less employee turnover, more stability in terms of the life of the firm and probably spend more time matching workers either as a result of higher skills needed or more selectivity.

Chart 5  
Vacancy Duration by Firm Size



Source: BLS (Unofficial) and BBVA Research

Chart 6  
Vacancy Duration (vacancies/hires) versus Unemployment/Vacancies Ratio, by Firm Size



Source: BLS (Unofficial) and BBVA Research

Unfortunately, we only have an unemployment rate for the aggregate economy, so our estimates must consider the problem of scale. The firm sizes responsible for most of the openings, hirings and firings are more representative of the economy and therefore fit better to the matching function previously examined in studies of structural unemployment. Nonetheless, it is still interesting to see if certain-sized firms are not behaving typically.

We estimate the matching function by relating the vacancy duration (vacancies/hires) and the unemployment-vacancies ratio to the level of hiring. We use a simple model and an alternative model that decomposes both short-term and long-term effects of these ratios on hiring. The long term trend variables are estimated through Hodrick-Prescott filtering. In Table 1, our results suggest that the matching function does not apply especially to the smallest of firms. Our results in Table 2 imply that the long-run effect of vacancy duration on the largest firms' hiring is not particularly significant. At the very least, the results are suggestive that different-sized firms have unique short-term and long-term effects on their hiring. Understanding the causes of these different effects will be crucial to combating any structural unemployment that results from the deepest postwar recession.

Table 1  
Dependent Variable: Hires by Firm Size (darker = p-value beyond 10%)

	Time	Duration	Unemployment	Constant	R-Squared
1 to 9	0.0014	0.06	-0.04	6.16	0.17
10 to 49	-0.0002	0.02	-0.39	10.59	0.83
50 to 249	-0.0011	0.25	-0.29	8.31	0.92
250 to 999	-0.0023	0.54	0.09	2.34	0.79
1000 to 4999	-0.0019	0.67	0.20	-0.06	0.82
5000+	0.0017	0.33	-0.97	11.20	0.85
Aggregate	-0.0007	0.23	-0.21	8.54	0.89

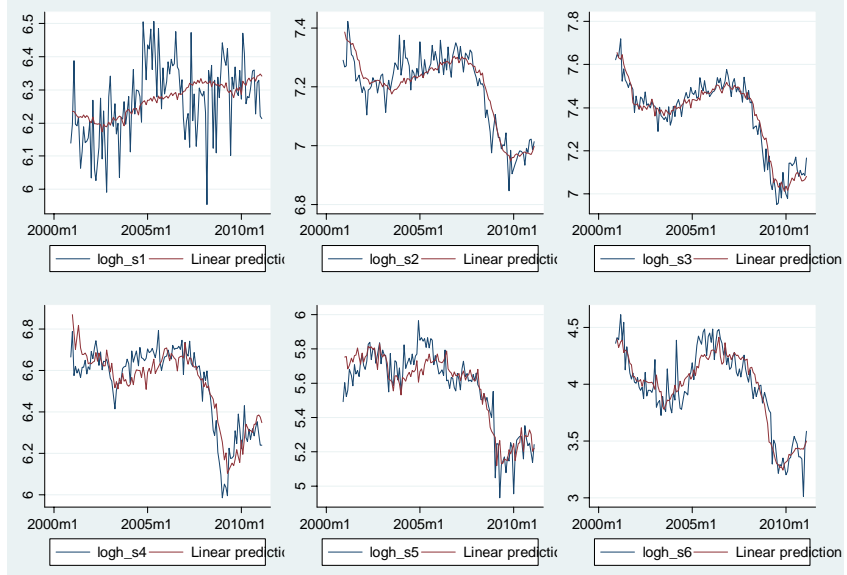
Source: BBVA Research

Table 2  
Dependent Variable: Hires by Firm Size (dark = p-value beyond 5%, darker = p-value beyond 10%)

	Time	Short-Run Duration	Short-Run Unemployment	Long-Run Duration	Long-Run Unemployment	Constant	R-Squared
1 to 9	0.003	0.368	2.158	0.132	-0.376	6.182	0.246
10 to 49	0.002	1.399	-2.167	-1.804	-1.780	35.986	0.894
50 to 249	0.009	1.611	-2.720	3.852	3.261	-47.297	0.946
250 to 999	-0.002	3.140	2.684	2.393	1.233	-25.632	0.870
1000 to 4999	0.000	3.369	2.545	2.253	1.545	-27.692	0.889
5000+	0.001	1.889	-6.120	-0.596	-1.939	28.429	0.858
Aggregate	0.000	3.744	1.118	0.224	-0.401	5.405	0.933

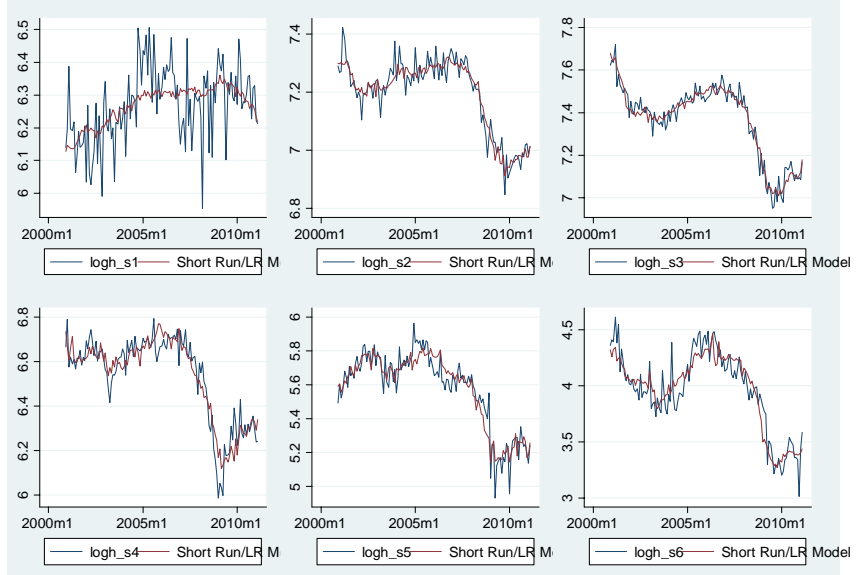
Source: BBVA Research

Chart 7  
OLS Matching Function Model Actual versus Fitted



Source: BBVA Research

Chart 8  
Short-run, Long-run Model Actual versus Fitted

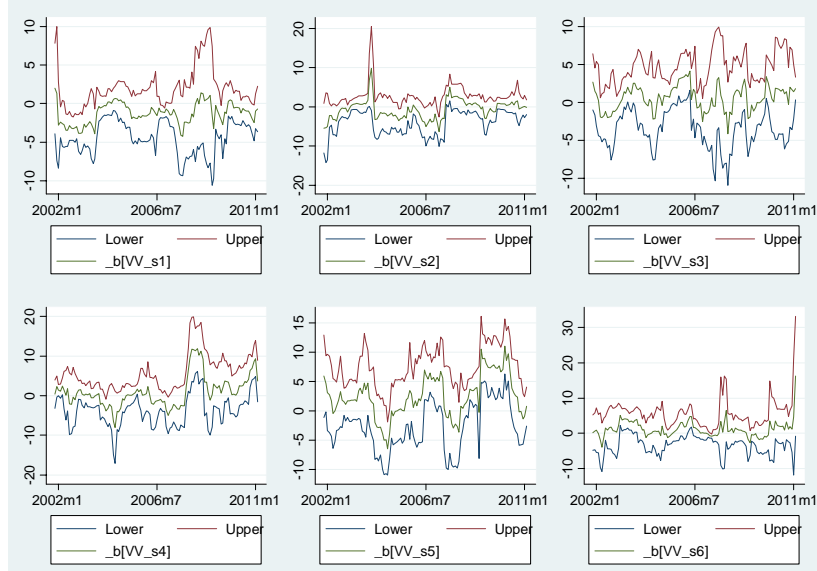


Source: BBVA Research

Another issue with the models is that there may exist time-varying properties, or in other words, the effect of the variables on hiring may shift over time. This may imply structural changes affecting certain size classes of firms and the labor supply in the economy. Our results imply some shifting of coefficients over time, although the time period used is quite short. One clear element from the rolling window regressions is that uncertainty over the value of the matching function coefficients likely increases during recessions for all size class firms.

Chart 9

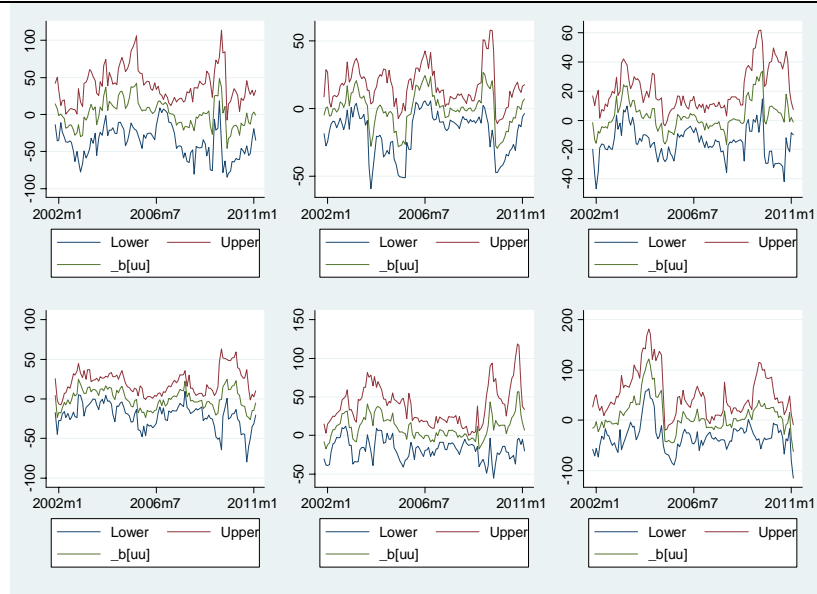
**SR/LR model Rolling Window Estimates of Short-Run Vacancy Duration Coefficient**



Source: BBVA Research

Chart 10

**SR/LR Model Rolling Window Estimates of Short-Run UV Ratio Coefficient**

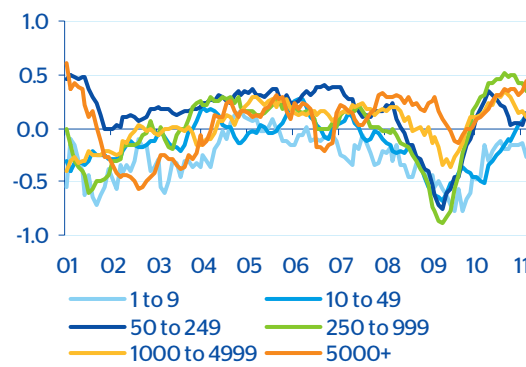


Source: BBVA Research

**Bottom line: Job creation and structural unemployment**

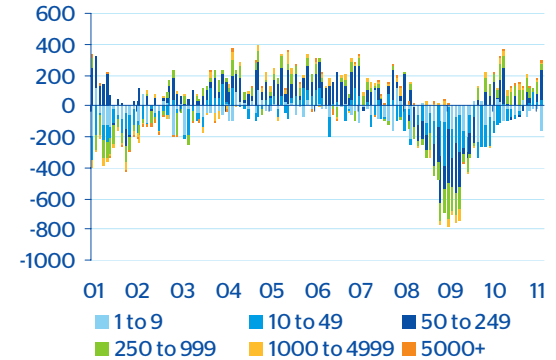
We have determined that the second, third and fourth-largest firm sizes represent the bulk of job openings and they are matching according to our expectation as guided by labor market economics. However, the pace and magnitude is not necessarily moving as strongly as we would desire. To tie things together, consider charts 11 and 12, which describe the contribution to net job creation in terms of rates and number of hires. Firms with 50-249 employees and 250-999 employees are contributing positively to recent gains in the hiring gap, which is the difference between hirings and separations each month. The smallest of firms are struggling both in terms of net job creation, contribution to net hiring and demonstrate different matching properties, likely because of the high rate of firm births in this size category. The largest of firms exhibit a high net job creation rate, but again these firms are demonstrating a different matching function and also the highest vacancy durations. Our results indicate that the bulk of the matching efficiency is conducted in the middle of the class size categories. Efforts to combat structural unemployment should focus on these firm sizes, to the extent that larger firms' high vacancy duration is an unmovable fact of the economy. If large firms' high vacancy duration is not a permanent fact of life - perhaps longer-term data can reveal otherwise - then these firms may feature as a pinpoint of policy. Our initial supposition is that this tendency is the former and not the later due to large firms' high sunk costs to market entry. Our other supposition is that the smallest of firms' (1 to 9 employees) failure to fit to the matching function is a result of the vicissitudes of entrepreneurship rather than a failure of labor markets. We have determined, however, that the largest of firms hold the highest vacancy durations and have more uncertain short-run and long-run dynamics than firms of other sizes. Although uncertainty over their matching efficiency has increased, so far the middle three size classes of firms are still representative of the matching function.

Chart 11  
**Net Job Creation by Firm Size, 6MMA, %**



Source: BLS (Unofficial) and BBVA Research

Chart 12  
**Historical Employment Gap Contribution, in Th**



Source: BLS (Unofficial) and BBVA Research

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