

## Why Does the Fed Study Regional Economics?

*By Ann Macheras, Santiago Pinto, Jessie Romero, and Pierre-Daniel G. Sarte*

**All of the 12 Federal Reserve Banks study the economies of their regions, but how is this information used? Regional data historically haven't swayed monetary policy decisions, but they provide policymakers and researchers with timely information about economic conditions and with context for interpreting data obtained from other sources.**

All of the 12 Reserve Banks operate a regional research function devoted to gathering, analyzing, and publishing regional data. How these data are used, however, is sometimes misunderstood. Perhaps the most visible use of this research is to provide each Reserve Bank's president with a summary of regional economic conditions to share at meetings of the Federal Open Market Committee (FOMC). This information plays a role in FOMC deliberations, even if regional conditions—including major regional shocks—may not sway monetary policy decisions.

Hurricane Katrina, for example, made landfall on the Gulf Coast of the United States on August 29, 2005, and according to some estimates caused more than \$200 billion in damages.<sup>1</sup> At its meeting on September 20, 2005, the FOMC discussed at length the storm's effect on the economy, including forecasts of a 0.5 percent reduction in GDP, the loss of 250,000 jobs, and the possibility that displaced workers from the region would contribute modestly to higher structural unemployment. These effects were judged to be temporary, however. At the same time, the president of the Atlanta Fed, whose district contained the worst-damaged areas, shared information from business contacts about the effects of the storm on the Gulf region's oil and gas infrastructure, as

well as information about spending on cleanup and rebuilding efforts. This information had potential national implications and supplemented the data gathered by Board of Governors staff. Ultimately, committee members concluded that higher energy prices resulting from the storm could exacerbate already-elevated inflation risks. The committee decided that the risks of higher inflation warranted continuing on the existing policy path and proceeding with a 25-basis-point increase in the federal funds rate.

Ultimately, the quantitative and qualitative regional data collected by Reserve Banks give policymakers, consumers, and businesses an additional gauge of economic conditions, as well as context for data obtained from other sources. These more granular data corroborate information on developing trends and contribute to an understanding of their implications for the broader macroeconomy.

### **From Regional Economy to Macroeconomy**

Macroeconomic research traditionally has focused on the effect of aggregate disturbances on the aggregate economy; disturbances to individual sectors or firms, it was believed, would tend to average out and thus be inconsequential for economy-wide outcomes. But a growing body

of research has emphasized the complex interconnections between sectors and firms and the ways in which idiosyncratic disturbances to specific sectors or firms (including those arising from natural disasters such as hurricanes) can have macroeconomic consequences. In a 2011 paper, for example, Xavier Gabaix of New York University explored the role of granular disturbances in economic activity and found that idiosyncratic shocks to large firms have measureable effects on aggregate outcomes. Specifically, using data on the 100 largest firms in the United States, he found that these firms account for about one-third of aggregate volatility.<sup>2</sup>

One author of this *Economic Brief* (Sarte), with Andrew Foerster of the Kansas City Fed and Mark Watson of Princeton University, studied sectors rather than firms and found that the importance of sector-specific disturbances relative to aggregate disturbances increased substantially over the period known as the Great Moderation, roughly 1984–2007. In a 2011 paper, they found that while idiosyncratic sectoral shocks explain about 20 percent of the variation in industrial production growth before 1984, they are responsible for 50 percent of aggregate fluctuations in industrial production after 1984.<sup>3</sup>

Much of the literature on sector- or firm-specific shocks abstracts from the regional composition of economic activity. There are several factors, however, that make regional considerations important when evaluating the aggregate effects of these shocks. First, to the extent that the various sectors of the economy are linked through a complex series of input-output relationships, these linkages take place across space by way of regional trade, and trading across distances is costly. Second, sectoral production of particular inputs or final goods varies considerably across regions. Third, the regions themselves vary considerably along different dimensions including local policies and regulations and the availability of fixed factors, such as land and structures. Finally, as emphasized in a 1992 paper by Olivier Blanchard of the Massachusetts Institute of Technology and Lawrence Katz of Harvard University, the mobility of labor across regions is important for macroeconomic adjustments to disturbances.<sup>4</sup> Taken together, these

facts imply that productivity changes in different regions of the country—caused by natural disasters, for example, or changes in regulations—will affect sectors in other regions and aggregate outcomes differently, even when the productivity changes are similar across regions. They also imply that the magnitude of the effects of disturbances to a given sector will vary depending on where the sector is located.

In a 2014 paper, Lorenzo Caliendo of Yale University, Fernando Parro of the Federal Reserve Board, Esteban Rossi-Hansberg of Princeton University, and Sarte show that the responsiveness of aggregate GDP to a regional productivity change varies considerably depending on where the change occurs.<sup>5</sup> These variations arise because productivity shocks change regional trade patterns by way of a selection effect that determines the productivity of firms operating in different regions and because the shocks cause labor to migrate toward regions that become more productive. But if these regions are lacking in fixed factors, they may be unable to support the inflow of workers, thus limiting the effects of the increase in productivity. The authors find that a productivity increase in California, for example, increases national output 46 percent more than a similar change in Florida. An understanding of regional economic characteristics and conditions, therefore, is key in determining the macroeconomic implications of regional and sectoral productivity changes.

### **Timely Information**

At both the regional and national levels, many data are available only with a long lag. The Bureau of Economic Analysis (BEA) releases its advance estimate of GDP growth, for example, a month after the relevant quarter has ended, and this estimate is then subject to numerous revisions over the coming months and even years. The BEA's estimates of GDP by state are published with about a six-month lag, and until August 2014, only annual estimates were available. But high-frequency surveys are a more timely—albeit imperfect—indicator of economic activity:

Many Reserve Banks conduct monthly surveys of business conditions in their districts. The Richmond Fed, for example, publishes a manufacturing sur-

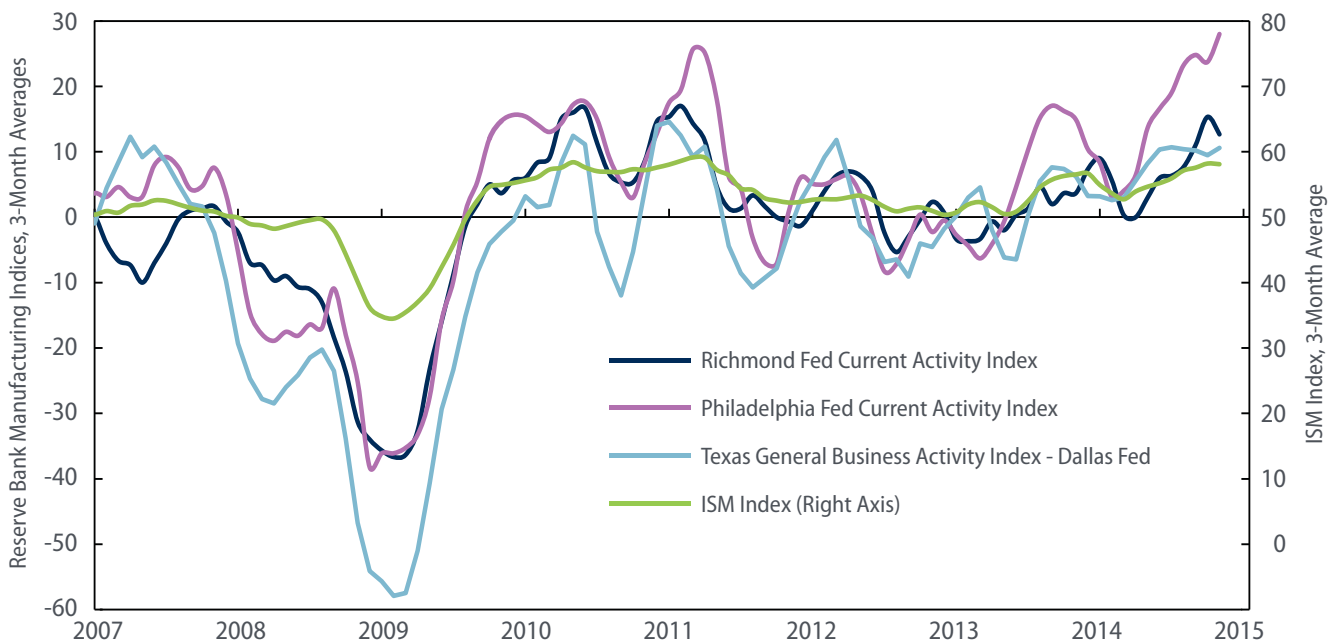
vey, a service sector survey, and surveys of business activity in the Carolinas and in Maryland. (The Fifth District includes Maryland, North and South Carolina, Virginia, Washington, D.C., and most of West Virginia.) These surveys ask a representative sample of establishments about activity such as product shipments or new orders in the current month compared to the previous month. The surveys also inquire about expectations for the next six months. The results are reported as diffusion indices, which are calculated by subtracting the percentage of respondents reporting a decrease from the percentage reporting an increase.<sup>6</sup>

Researchers at the Richmond Fed have found that the Bank’s manufacturing survey provides meaningful information about economic activity in the Fifth District.<sup>7</sup> For example, the resulting index of current manufacturing activity is closely correlated with gross state product and state personal income. The index also is a leading indicator of changes in manufacturing employment.

The Fed’s regional surveys are an additional source of information about national economic conditions. A study by the Dallas Fed found that Reserve Banks’ manufacturing surveys are closely aligned with the Institute for Supply Management’s primary manufacturing index, a widely watched indicator of future GDP growth.<sup>8</sup> (See Figure 1.) Researchers at the Philadelphia Fed compared that Bank’s Business Outlook Survey (BOS) to the recession dates eventually announced by the National Bureau of Economic Research and found a close match. During the most recent recession, for example, the BOS turned negative in December 2007, the official start of the recession, and turned positive in September 2009, three months after the recession’s official end.<sup>9</sup> Richmond Fed economists also have found that deviations from trend in Richmond’s business and service sector surveys tend to line up with turning points in the business cycle.<sup>10</sup>

Diffusion indices, however, do have their drawbacks. The high frequency of the surveys makes the data

**Figure 1: Reserve Bank Manufacturing Indices Closely Align with the ISM Index**



**Sources:** Institute for Supply Management’s Manufacturing Report on Business, Richmond Fed’s Fifth District Manufacturing Survey, Philadelphia Fed’s Business Outlook Survey, Dallas Fed’s Texas Manufacturing Outlook Survey, Haver Analytics.

**Note:** All four indices are seasonally adjusted diffusion indices that measure month-to-month changes in conditions. The indices are calculated from survey respondents who report that conditions are better, the same, or worse than they were in the previous month. The ISM calculates its index by adding the percentage of “better” responses to half the percentage of “the same” responses. So in the ISM index, 50 indicates an average response of “the same.” The Reserve Banks calculate their indices by subtracting the “worse” responses from the “better” responses. So in their indices, zero indicates an average response of “the same.”

potentially quite noisy. Diffusion indices also are sensitive to changes in sample size and depend on the subjective definitions of the respondents. One respondent, for example, might decide to report a small change in orders as an increase, while another might view the same change as “no change.”<sup>11</sup> Research is ongoing into how to improve the validity and relevance of the indices. Examples of this work include measuring sampling uncertainty in diffusion indices and constructing and reporting the implied confidence intervals, improving procedures for making seasonal adjustments, weighting responses differently, and providing different levels of aggregation, for example at the state rather than the district level.

### Creating Context

Perhaps the best known of the Fed’s regional data products is the *Beige Book*, a compendium of anecdotes from each of the 12 Federal Reserve Districts that is published eight times per year. Through interviews with business contacts and market experts, each Bank gathers real-time information about consumer demand, business investment, wages, and prices in its respective district. The publicly available book includes a report from each district as well as a national summary.

Several studies have examined whether the *Beige Book* has value as a predictor of future economic activity or monetary policy actions.<sup>12</sup> While the national summary does appear to closely track the later GDP announcement for the corresponding time period, researchers at the Minneapolis Fed concluded that it doesn’t improve upon private sector forecasts and is not a good indicator about the future course of monetary policy.<sup>13</sup> But the *Beige Book* is not intended to be a predictor; instead, it provides policymakers with nuance and context that cannot be gleaned from hard data or more sophisticated statistical models. It may also alert them to topics or issues that deserve closer attention.

One component of the Index of Industrial Production, published by the Board of Governors, is the number of production hours worked. The Board obtains those data from the Bureau of Labor Statistics, which surveys workers during a particular week of the month.

But those surveys can be misleading; sometimes, winter weather causes temporary shutdowns of manufacturing plants. If that happens the week before the survey, for example, workers likely will put in significant overtime during the survey week to catch up. Based solely on the number of hours worked, researchers at the Board would expect a large jump in industrial production. But the Board can call the regional Reserve Banks and ask them to reach out to their survey and *Beige Book* contacts, as they did during a series of storms in early 2014. The industrial production team was able to learn what was behind the numbers and adjust their expectations accordingly.

The Reserve Banks also gather information from their boards of directors, advisory councils, and meetings with regional leaders. The Richmond Fed, for example, conducts regular regional forums and industry roundtables. Twice per year, a delegation from the Bank visits different areas in the Fifth District to talk with business and civic leaders, educators, and other members of the community to learn first-hand about local economic conditions. In addition, the Bank hosts a number of industry roundtables throughout the year, which offer a forum for executives from different sectors to share information about the state of their industries.<sup>14</sup> These and other events can help the Richmond Fed identify medium-run trends before they appear in the data and help the Bank’s economists decide where to focus their research. Members of the Community Investment Council, for example, started sharing stories about problems in the subprime mortgage market before those problems became widely known.<sup>15</sup>

### Sharing Information with the Public

The regional Reserve Banks also serve as unbiased sources of state- and district-specific information. In some cases, this information—such as monthly data on new orders or shipments—is not available elsewhere. In other cases, the Banks collect and analyze information from multiple sources to make it more accessible to the public. Each month, for example, the Richmond Fed publishes *Snapshot*, a compilation of statistics about employment, income, housing, and other indicators for each state individually and for the Fifth District as a whole.<sup>16</sup>

The Richmond Fed also provides state and national legislators with customized information about the areas they represent. In some cases, these data offer an overview of a local economy. In other cases, the Richmond Fed provides data specific to policy debates. During recent budget debates, for example, the Bank developed maps illustrating federal contract spending in each Fifth District state.

Following the 2007–09 recession, in which the housing market played a significant role, the Richmond Fed began publishing mortgage performance summaries for each state in the district and for the district as a whole. The Bank also has published several surveys of real estate agents in Maryland and Virginia. These data, along with other regional research products, offer insights into local conditions that might be difficult for most businesses, consumers, or policymakers to obtain on their own.

## Conclusion

Although information about regional conditions plays only an indirect role in the conduct of monetary policy, regional economic research can help economists and policymakers better understand the effects of regional and sectoral shocks on the aggregate economy. The quantitative and qualitative regional data collected by the Fed also provide an additional gauge of economic conditions and context for data obtained from other sources. The Richmond Fed and the other Reserve Banks are well-positioned to collect and analyze a wide variety of data, and they publish these data in multiple formats to make them easily accessible to consumers, business leaders, and regional policymakers as a public service.<sup>17</sup> ■

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## Endnotes

<sup>1</sup> See Congleton, Roger D., “The Story of Katrina: New Orleans and the Political Economy of Catastrophe,” *Public Choice*, April 2006, vol. 127, no. 1, pp. 5–30.

<sup>2</sup> Gabaix, Xavier, “The Granular Origins of Aggregate Fluctuations,” *Econometrica*, May 2011, vol. 79, no. 3, pp. 733–772. See also Acemoglu, Daron, Vasco M. Carvalho, Asuman Ozdaglar, and Alireza Tahbaz-Salehi, “The Network Origins of Aggregate Fluctuations,” *Econometrica*, September 2012, vol. 80, no. 5, pp. 1977–2016.

<sup>3</sup> Foerster, Andrew T., Pierre-Daniel G. Sarte, and Mark W. Watson, “Sectoral versus Aggregate Shocks: A Structural Factor Analysis of Industrial Production,” *Journal of Political Economy*, February 2011, vol. 119, no. 1, pp. 1–38.

<sup>4</sup> Blanchard, Olivier Jean, and Lawrence F. Katz, “Regional Evolutions,” *Brookings Papers on Economic Activity*, 1992, no. 1, pp. 1–75.

<sup>5</sup> Caliendo, Lorenzo, Fernando Parro, Esteban Rossi-Hansberg, and Pierre-Daniel G. Sarte, “The Impact of Regional and Sectoral Productivity Changes on the U.S. Economy,” Federal Reserve Bank of Richmond Working Paper No. 13-14R, Revised November 2014.

<sup>6</sup> See Price, David A., and Aileen Watson, “The Richmond Fed Manufacturing and Service Sector Surveys: A User’s Guide,” Federal Reserve Bank of Richmond *Economic Brief*, March 2014.

<sup>7</sup> See Harris, Matthew, Raymond E. Owens, and Pierre-Daniel G. Sarte, “Using Manufacturing Surveys to Assess Economic Conditions,” Federal Reserve Bank of Richmond *Economic Quarterly*, Fall 2004, vol. 90, no. 4, pp. 65–92.

<sup>8</sup> See Kerr, Emily, Pia Orrenius, Jack Wang, and Jesús Cañas, “Fed Manufacturing Surveys Provide Insight into National Economy,” Federal Reserve Bank of Dallas *Economic Letter*, October 2014, vol. 9, no. 12.

<sup>9</sup> “Providing Reliable Information on the Economy,” Federal Reserve Bank of Philadelphia *2009 Annual Report*, pp. 30–33.

<sup>10</sup> See Owens, Raymond E., and Pierre-Daniel G. Sarte, “How Well Do Diffusion Indexes Capture Business Cycles? A Spectral Analysis,” Federal Reserve Bank of Richmond *Economic Quarterly*, Fall 2005, vol. 91, no. 4, pp. 23–42.

<sup>11</sup> For more, see Owens and Sarte (2005).

<sup>12</sup> For an overview, see Courtois, Renee, “How’s Business? The Role of the *Beige Book* in Fed Policymaking,” Federal Reserve Bank of Richmond *Region Focus*, Summer 2009, pp. 5–7.

<sup>13</sup> Fetting, David, Arthur J. Rolnick, and David E. Runkle, “The Federal Reserve’s *Beige Book*: A Better Mirror than Crystal Ball,” Federal Reserve Bank of Minneapolis *The Region*, March 1999.

<sup>14</sup> See “Regional Information and Analysis Inform Monetary Policy,” Federal Reserve Bank of Richmond *2012 Annual Report*, pp. 26–29.

<sup>15</sup> The Community Investment Council was known as the Community Development Advisory Council until 2011.

<sup>16</sup> See Federal Reserve Bank of Richmond *Snapshot* at [www.richmondfed.org/research/regional\\_economy/reports/snapshot](http://www.richmondfed.org/research/regional_economy/reports/snapshot).

<sup>17</sup> For example, see the reports available from the Richmond Fed at [www.richmondfed.org/research/regional\\_economy](http://www.richmondfed.org/research/regional_economy).

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