Revised U.S. gross domestic product (GDP) growth numbers released in summer 2011 revealed that the national economy was in worse shape two years after the recession ended than earlier data had suggested and that the downturn itself had been deeper than previously estimated. Revisions such as these from government agencies are commonly issued to account for errors, data updates and measurement changes. Such adjustments involve important economic variables and affect not only the latest available statistic, but also the historical properties of an entire data series. That means revisions can be far-reaching, affecting structural model results, forecasts and monetary policy.

When data are subject to change, real-time data—the information available to researchers and policymakers at the time they conducted their analyses—rather than the most up-to-date figures are necessary to appropriately assess a particular economic model or forecast or understand a given monetary policy action. A growing body of empirical macroeconomic literature suggests that analyses using real-time data often yield substantially different—and more accurate—conclusions than those relying on the final revisions.

However, such research remains limited, largely reflecting the difficulties of compiling real-time data and the technical complexity of using “vintages,” or snapshots of data at points in time.

Economists Dean Croushore and Tom Stark published their large Real-Time Data Set for Macroeconomists (RTDSM) roughly a decade ago, with snapshots of the U.S. economy starting in 1965. Their work established the importance of real-time data and became the U.S. dataset for forecasters and others engaged in research affected by data revisions. Yet very little work has been done to collect and analyze such figures for economies outside the U.S.—even as globalization has made real-time international data increasingly relevant. The Original Release Data and Revisions Database (ORDRD) from the Organization for Economic Cooperation and Development (OECD) is the most comprehensive and well-maintained international real-time database. Updated monthly, it provides vintages of monthly and quarterly data for member countries beginning in January 1999. Its drawback: It covers only the past decade, even though the OECD’s recorded figures go back to the organization’s inception in 1961.

Seeing the value in extending the dataset, Federal Reserve Bank of Dallas...
Working with ‘Vintages’

The downward revision to real GDP in the U.S. in summer 2011 revealed that the pace of inflation-adjusted economic growth had substantially decreased during the second quarter. Revisions to prior quarters showed real output in the 2007–09 recession fell much more than initially estimated (Chart 1). The chart demonstrates how the picture can change when new vintages of data are used.

If we move a few vintages back, the U.S. real GDP real-time data series would resemble the matrix in Table 1, where each successive column characterizes the snapshot of quarterly data containing the information available at that vintage date. Third quarter 2011 revisions reveal a slower economy not only in second quarter 2011 but dating back to the beginning of the recession. Traditional revised-data research would use only the last column of data—or the latest available information—ignoring previous revisions.

An important aspect of real-time research is analysis of revisions. Generally, when governments make efficient use of all available information, revisions add “news” and are not predictable between vintages. When they don’t, revisions merely reduce “noise” and are inefficient, and later values may be predicted. The RTHD-OECD presents the opportunity to assess efficiency in a longer-vintage span than previous real-time data allowed. Categorizing revisions by the lag length (in quarters) with which they are released, we look for recognizable patterns that would provide evidence against efficiency—specifically whether revisions are significantly positive or negative over the whole historical period.

At a minimum, efficiency requires that revisions to a series should be zero on average. Accordingly, we check whether revisions differ significantly from zero. The results show that in 16 of 26 countries, revisions seem to be predictable (i.e., inefficient) for at least one of the four variables considered (Table 2).

The positive readings in virtually all significant revisions suggest that statistical agencies may have a tendency to underestimate inflation and growth in real GNP/GDP, the price level, industrial production and money supply in their earlier estimates. Looking at the overall dimension of corrections, the absolute value of mean revision analysis (Chart 2) suggests that in international research, corrections are simply too large to be ignored—as traditional revised-data research does.

Four Important Applications

The RTHD-OECD may be used in many areas of international macroeconomic research in which data revisions matter. Four important applications illustrate the potential of the dataset—which, when merged with ORDRD, provides coverage from first quarter 1962 to second quarter 2010:

1. Testing some of the most frequently used output-gap estimation techniques. The output gap, a key statistic in many important macroeconomic models, shows the difference between an economy’s potential and current output. By assessing output-gap estimation methods, researchers and policymakers can identify those generating the most accurate signals.

2. Assessing the predictive ability of the output gap. The output gap is often used as an indicator of future inflation, based on the empirically observed relationship between the two variables (initially identified by economist A.W. Phillips and known as the “Phillips curve”). Using the combined dataset, we find that the additional predictive power of the output gap is minimal or nonexistent in real time.

3. More accurately gauging the effect of inflation when interpreting data revisions. In most theoretical models, inflation is thought to have a significant, but temporary, impact on the economy. With the dataset, we find that by making accounting more difficult, higher inflation amplifies the causes and extent of data revisions, which could increase the likelihood of policy mistakes.

4. Spotting vulnerabilities in nominal exchange-rate forecasting models. Most of these models are developed and tested...
using revised data.12 Our real-time analysis adds evidence suggesting that revised data analysis may result in misleading conclusions. A particularly interesting case is the British pound, whose exchange rate is predictable at the short horizon with revised data but not with real-time data.

**Importance of Real-Time Data**

A growing body of empirical macroeconomic literature supports the importance of real-time data analysis. Making use of more-efficient real-time information, researchers can more easily separate news from noise and more accurately detect patterns in data. Given increased globalization and the advantages of using real-time data, international researchers may want to rethink the practice of using revised data because of the potential for misleading conclusions. The RTHD-OECD can serve as a standard for forecasters and others engaged in international research who confront data revisions.

Fernandez is an economist in the Houston Branch and Koenig is a vice president and policy advisor in the Dallas office of the Federal Reserve Bank of Dallas. Nikolsko-Rzhevskyy is an assistant professor of economics at the University of Memphis.

### Table 1

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**Notes**


3. The OECD General Statistics Bulletin was replaced after 1964 by the OECD Main Economic Indicators. See
Data Revisions Matter Globally

Absolute Mean Revisions for Real GNP/GDP Too Large to Ignore

Absolute Mean Revisions for Industrial Production Appear Substantial

NOTES: Revisions are defined as the difference in the value of a given variable in subsequent vintages. “Absolute mean revision” refers to the total magnitude of changes, that is, adding changes whether they’re positive or negative. All variables are expressed in terms of annualized quarter-over-quarter growth rates. Real gross national product (GNP) is used when real gross domestic product (GDP) is unavailable.

SOURCE: Authors’ calculations.